

# **Deskstudies underpinning the Dutch vision on the reform of the Common Fisheries Policy**

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# Samenvatting

Het Europese Gemeenschappelijke visserijbeleid (GVB) moet in 2012 herzien en gewijzigd worden. Naar verwachting zal het beleid aanzienlijk veranderd worden. Voorbereidingen voor het herzieningsproces zijn gestart met de uitgifte van het Groenboek door de Europese Commissie (EC 2009)

De Nederlandse overheid wil voor september 2009 een stellingname opstellen over het toekomstige visserijbeleid. Er is van februari tot april 2009 een breed en snel consultatieproces gehouden, waarbij alle belangrijke belanghebbenden in Nederland betrokken waren. Als onderdeel van het proces van het opstellen van de Nederlandse visie, zijn zes wetenschappelijke 'kantooronderzoeken' (deskstudies) en twee 'feitenbladen' (factsheets) uitgegeven aan relevante onderzoeksgroepen die gekoppeld zijn aan Wageningen Universiteit en Researchcentrum: Wageningen IMARES, LEI, Studiegroep voor milieubeleid en Van Hall Larenstein. De resultaten van de deskstudies worden samengevat onder de koppen Ecologie, Economie, Managementstrategieën, Bestuur en Integratie met ander beleid

## Ecology

De ecologische aspecten die in deze studie onderzocht zijn, hebben alleen betrekking op de kwestie van **discarding**.

De definitie van discards die in dit rapport gebruikt wordt, is: "Discards, of discarded vangst is dat deel van het totale organische materiaal van dierlijke aard in de vangst dat weggegooid wordt of om wat voor reden dan ook in de zee gedumpt wordt. Het omvat geen plantaardige materialen en afval na oogst. De discarded vangst kan levend of dood zijn."

Er zijn vijf verschillende soorten discards:

1. Discards van te kleine vis
2. Discards van vis boven de quota
3. Discards van soorten van lage waarde
4. High-grading
5. Discards van niet-commerciële soorten

Voor al deze soorten discards kan potentieel een andere strategie nodig zijn voor het voorkomen van discarding.

In een recente (2005) publicatie van FAO wordt de wereldwijde hoeveelheid discarding geschat op 8 procent, wat overeenkomt met ongeveer 7 miljoen ton discards. De Noordzee zorgt voor het hoogste niveau aan discarding in de wereld, hoewel een aantal auteurs de discard schattingen van de FAO tegenspreken.

In de periode 2002-2007 bestond de algemene vangst van de Nederlandse boomkorvisserij uit 17-42% aanvoer, 21-28% discards en 37-60% benthos en puin. Het algemene discard percentage in de Nederlandse pelagische vloot was in 2003 het hoogste (17%) en bedroeg in de jaren 2004-2007 tussen de 6% en 8%.

De ecologische impact van discarding is tweeledig: (i) een direct effect op de weggegooiden soorten en (ii) indirecte effecten op soorten die gebruik maken van discards. Onder de directe effecten vallen een vermindering van het aantal verschillende soorten, veranderingen in interactie tussen jager en prooi en veranderingen in de relatieve overvloed van soorten. Discarded vis in opgehaalde visnetten heeft een lage overlevingskans (minder dan 10%). De indirecte effecten verwijzen naar de effecten van discards op andere diersoorten in het ecosysteem. In de zuidelijke Noordzee dragen discards bijvoorbeeld maar voor 1 – 10% bij aan het dieet van bentische carnivoren en bodemvissen. Maar discards lijken wel belangrijk te zijn als voedsel voor verschillende zeevogels in de Noordzee. Zeevogels die op discards azen eten ongeveer 70-92% van de weggegooiden rondvis,

20 – 35% van de weggegooide platvis en 3 – 17% van de ongewervelde weggegooide soorten. Discards in de Noordzee kunnen potentieel meer dan 6 miljoen zeevogels ondersteunen.

Een officieuze nota door de EU (EC 2008a) vermeldt dat discarding in de boomkorvisserij binnen 6 jaar verlaagd moet worden tot 15%. In de overeenkomst tussen de EU en Noorwegen uit 2008 geeft de Commissie aan dat discarding uitgeroeid moet worden en dat een discard ban overwogen kan worden in het nieuwe GVB. De Nederlandse overheid heeft aangegeven dat algemeen discarding in 2013 met 50% verlaagd moet zijn, vergeleken met 2007.

Er zijn verschillende veranderingen in vistuigen en gedrag die kunnen bijdragen aan een aanzienlijke vermindering van de hoeveelheid discards. Maar de belangrijkste factor is echter niet of selectieve verbeteringen behaald kunnen worden, maar of de juiste stimulans bestaat om deze meer selectieve vistuigen te gaan gebruiken.

Het discarding van vis, gevoelige soorten (bijv. zoogdieren, haaien) en benthos wordt door velen gezien als een onethische handelswijze. Er heerst een grote druk vanuit de maatschappij om discards te verminderen of elimineren om deze ethische kwesties. Dit zorgt voor een stimulans voor vissers om methoden te implementeren om discarding te voorkomen.

De economische “stimulans voor discarding” wordt gedefinieerd als het verschil tussen de kosten van aanvoer en de kosten van discarding. De economische stimulans om ongewenste bijvangst te voorkomen wordt bepaald door de kosten van het overstappen van de huidige vismethode naar een meer selectieve vismethode, de kosten van de veranderingen in de samenstelling van de vangst en de kostenverlaging die gekoppeld is aan het verwerken van bijvangst.

Een feitelijke ban op discarding is moeilijk uit te voeren en is waarschijnlijk alleen maar effectief met een reeks aanvullende maatregelen. In Noorwegen bijvoorbeeld vormt de discard ban niet het centrale punt in het anti-discard beleid. Centrale punten zijn regels die het gebruik van selectief vistuig verhogen en het flexibele gesloten gebiedbeleid in combinatie met de verplichting voor vissersschepen om van visgrond te wisselen als het discard niveau te hoog wordt.

De stimulans om over-quota van bijvangst aan te voeren kan gevoed worden door vissers toe te staan bijvangsten op de markt te verkopen en een deel van de inkomsten te innen, op een dergelijke manier dat vissers gecompenseerd worden voor de aanvoerkosten (Aanpak geschatte waarde, Nieuw-Zeeland).

Het instellen van maximale discard doelstellingen wordt vaak gezien als potentieel element van “Management op basis van resultaten”. Bij het promoten van ondernemerschap zou de voorkeursmethode waarschijnlijk zijn het instellen van doelstellingen per bedrijf en per jaar, zodat de efficiënte visplannen ontwikkeld en herzien kunnen worden. Er kunnen observatiesystemen gebruikt worden om de prestaties van de vissersvloot te controleren.

## Economie

De economische prestaties van de Europese vloten wordt gecontroleerd door de STECF Working Group on the Preparation of Annual Economic Report (STECF 2009). Het conceptrapport van die groep is nog niet goedgekeurd door STECF, maar de conclusie uit het rapport is dat het inkomen van de Europese vloot licht gestegen is tussen 2003 en 2007. Het totale inkomen dat door de Europese vissersvloot gegenereerd is, was in 2007 ongeveer 7,6 miljard euro<sup>1</sup>. De voorspellingen voor 2008 en 2009 laten een verslechtering in economische prestaties zien, hoewel er nog geen cijfers beschikbaar zijn. Door de brandstofcrisis in 2008 stegen de operationele kosten aanzienlijk en ontstonden ernstige twijfels over de toekomstige structuur van de Europese vloot, vooral voor schepen die niet zuinig met brandstof omgaan. Vismogelijkheden verminderen voor een aantal belangrijke visstanden, waardoor het inkomstenpotentieel van grote sectoren van de Europese vloot

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<sup>1</sup> Denemarken, Cyprus, Malta en Slovenië zijn niet meegerekend



daalt. En de wereldwijde economische crisis van 2009 lijkt van invloed te zijn op de vraag naar vis, en dus op de visprijzen.

De economische invloed van discarding op de Nederlandse boomkorvisserij werd onderzocht in Buisman et al. (2001). De geschatte waarde van de jaarlijkse discards in misgelopen toekomstige opbrengsten van vangsten in de Nederlandse boomkorvisserij werd geschat op 70% van de jaarlijkse aanvoerwaarde.

## Managementstrategieën

### Evaluatie van visserijbeleid

Zes rapporten met een soort evaluatie van visserijbeleid zijn gecontroleerd. De algemene conclusies zijn:

- Er bestaat geen echte systematische evaluatie van beleid, hoewel de onderzoeken door het WNF en de Nederlandse rekenkamer in de buurt komen van een dergelijke beleidsevaluatie omdat ze de meeste aspecten van visserijbeleid aanpakken en omdat ze maatregelen aan doelstellingen koppelen.
- Er bestaat een onderscheid tussen beleidsherziening en beleidsevaluatie. De meeste onderzoeken die in dit rapport bekeken worden, vallen in de categorie beleidsherziening.
- Oorzaken voor geobserveerde trends zijn zowel natuurlijk als menselijk, en om die twee te scheiden moet het tijdsbestek voor evaluatie lang genoeg zijn.
- Gezien de complexiteit van het gebied van visserijbeleid zijn geavanceerde evaluatiemethoden nodig die overgenomen en aangepast kunnen worden uit andere gebieden (Crabbe and Leroy 2008)

Geïdentificeerde gaten:

- De website van de EC bevat geen koppelingen naar beleidsevaluatie;
- Doelstellingen en methoden voor evaluatie ontbreken;
- Biologische controle vindt plaats via evaluatie van de visstand met betrekking tot referentiepunten. Door het zeer korte tijdsbestek (1 jaar) is het onmogelijk te evalueren en inventariseren.
- Economische evaluaties zijn zwak. Er is geen evaluatie van bijv. "overcapaciteit"
- Sociale evaluaties ontbreken.

### (Nederlands) co-management

Het Nederlandse co-management systeem voor visserij is een publiek-privaat partnerschap (public-private partnership) waarin gebruik gemaakt wordt van de capaciteit en belangen van gebruikersgroepen, aangevuld met de mogelijkheid van het visserijbestuur tot het opstellen van wetten en bieden van administratieve ondersteuning. De belangrijkste effecten van het Nederlandse co-management systeem zijn een beter gebruik van quota en meer overeenstemming met de quotaregels en beperking aan motorvermogen. Dit waren de initiële redenen voor het implementeren van het systeem en dit lijkt succesvol te zijn. Het slagen van dit project is slechts deels toe te schrijven aan het co-management systeem. Ook andere ontwikkelingen als aangescherpte controle in combinatie met vergunningen, inputmanagement (maximaal aantal dagen op zee) en maximale vistuigbreedte voor een dubbele boomkor hebben bijgedragen aan dit succes (Smit 1997). Wat bestempeld wordt als co-management systeem is in de praktijk zelfs slechts een ITQ-management systeem (individueel overdraagbaar quotum). Daarom is de kern van het systeem geen gezamenlijk beheer van visstanden, maar een decentrale poging tot het controleren van de quota en het zorgen dat de aanvoer overeen blijft stemmen met de vastgestelde Totaal Toegestane Vangst (Total Allowable Catch, TAC).

Uit het Nederlandse voorbeeld leren we dat co-management binnen het GVB een haalbare optie is. Co-management is een specifieke lokale deelnameregeling die past in de lokale institutionele setting. We leren echter ook uit het Nederlandse voorbeeld dat het Nederlandse co-management voor visserij niet zozeer een participerende interactieve beleidsregel is, waarbij vissers actief betrokken zijn bij het opstellen van beleidsregels.

## Bestuur

Breed gezien omschrijft bestuur sturende of leidende systemen. Er bestaan twee verschillende definities van bestuur:

1. **Descriptief.** De eerste definitie benadrukt de **analytische beschrijving** van veranderingen in locus en focus van het bestuur. Het beschrijft de tekortkomingen van het staatsmodel van een land en de opkomst van nieuwe praktijken en regelingen waarin beleid maken en politiek plaatsvindt. Deze definitie draait om het overdenken van het staatsmodel en de territoriale order van beleid maken en politiek bedrijven.
2. **Prescriptief.** De tweede definitie ziet bestuur als managementmodel. In dit model draait bestuur om het beheren van maatschappelijke processen en het zoeken naar oplossingen voor niet gestructureerde of moeilijke problemen in geconstrueerde beleidsnetwerken waarin publieke en private spelers problemen definiëren en onderhandelen over mogelijke oplossingen.

Trends in visserijbestuur:

- Visserijbeheer moet relateren aan verschillende politieke arena's (cf. KMS, Natura 2000, WSSD, doelstelling maximaal duurzame opbrengst) Maritieme beleidsregels zullen een uitdaging vormen voor visserijregels. Regels en verhandelingen van andere mariene beleidsdomeinen zullen van invloed zijn op de inhoud en organisatie van het GVB.
- Dit leidt tot een verandering in gesprekken: van gesprekken over visstanden tot het behoud van ecosystemen en van sectorgebaseerde visserij tot integratieve mariene beleidsregels. Dit betekent dat visserijbestuur het volgende moet omvatten:
  - deelname, rekenschap en legitimiteit
  - met meer belangen en belanghebbenden
  - binnen sectoren, niveaus en activiteiten
  - binnen lidstaten en regio's
  - op een geïntegreerd (eco)systeemniveau

## Integratie met ander beleid

Traditioneel gezien wordt visserijbeheer in Europa gevormd onder de GVB. Met de opkomst van andere, meer milieugerichte regels, zoals de regels op het gebied van vogels en habitat, het Natura 2000-raamwerk, de waterregels en, sinds kort, de Kaderrichtlijn Mariene strategie (KMS) en het Maritiem Beleid, worden mariene- en maritieme regels, die van invloed zijn op de visserij, veel vaker ergens anders vormgegeven. Deze (nieuwe) beleidsregels hebben een andere focus (economische en ecologische doelen), bevatten andere belangen (en dus belanghebbenden) en richten zich op andere manieren van het stellen van regels (van uitdagend en integratief tot instrumenteel door de staat opgelegd) (Van Hoof en van Tatenhove 2009). Met bijvoorbeeld het doel van de KMS tot het bereiken van een goede milieustatus, komt er een einde aan de enige competentie van de GVB om de visstand te behouden. We kunnen in Nederland ook zien dat de implementatie van de beleidsregels die het maritieme milieu moeten regelen niet noodzakelijkerwijs geregeld worden door het overheidsorgaan dat verantwoordelijk is voor visserij, maar door het ministerie van watermanagement. Als gevolg daarvan wordt de herziening van het Gemeenschappelijk Visserijbeleid in 2013 binnen nieuwe regelgevende grenzen geplaatst.

Conform de KMS moet tegen 2012 de formatie van een samenhangend netwerk van MPA's (beschermde mariene zones) bereikt zijn. Natura 2000-locaties, die onderdeel vormen van de regels op het gebied van vogels en habitat, zijn gericht op het instellen van een samenhangend Europees ecologisch netwerk van speciale gebieden voor behoud, gebaseerd op specifieke habitattypes en –soorten. Lidstaten moeten een lijst voorstellen met geselecteerde gebieden en daarop moeten deze speciale gebieden voor behoud beoordeeld worden op Gemeenschapsbelang voordat ze officiële speciale gebieden voor behoud worden.

In de OSPAR-conventie wordt ook een netwerk van MPA's overwogen. Deze OSPAR-gebieden moeten beschermde zones creëren in de mariene gebieden, gericht op gebieden met een zeer belangrijke reeks diersoorten, habitats en ecologische processen en gebieden waar ecologische processen door menselijke activiteiten ondermijnd worden. Een samenhangend netwerk van MPA's dient in 2010 opgesteld te worden.

Alle milieuregels als de regels op het gebied van vogels en habitat, het watteraamwerk, de Kaderrichtlijn Mariene strategie en het Maritieme beleid dienen tijdens hun implementatieproces opgenomen te worden. De nadruk ligt echter op informatie en consultatie tijdens alleen de eerste stappen van de beleidsformatie (het niveau van groenboek en witboek). Tijdens operationalisatie en implementatie worden milieuregels vaak op een nogal technocratische manier in de praktijk gebracht. Milieuregels, zoals bijvoorbeeld de water- en marineregels, zijn gebaseerd op een op een wetenschappelijke manier afgeleide definitie van te behalen doelstellingen (goede milieustatus). Deze doelstellingen leiden tot de ontwikkeling van een reeks indicatoren waarmee milieuprocessen gecontroleerd en beheerd worden. Het operationeel maken van het milieubeleid wordt vooral gezien als technische kwestie waarbij deelname van belanghebbenden minder nodig geacht wordt.

We concluderen dat in de toekomst het visserijbeleid in toenemende mate zal worden vormgegeven of bepaald door andere beleidsdomeinen, met name de natuurwetgeving. De rol van de visserijsector in de ontwikkeling van deze nieuwe beleidsregels is nogal beperkt door de afwezigheid van deelname in het opstellen van de regels. Daarnaast wordt de visserijsector steeds meer geconfronteerd met meer belangen en belanghebbenden. Hierdoor wordt het algehele belang van visserij in het debat over het hoofd gezien en wordt de discussie gestuurd richting een meer milieugerichte doelstelling.

# Executive summary

The European Common Fisheries Policy (CFP) is up for review and change in 2012. The expectation is that this will entail a substantial reform of the policy. Preparations for the process of reform have started with the release of the Green Paper by the European Commission (EC 2009)

The Dutch government aims to prepare a position paper on the future fisheries management by September 2009. A broad and quick consultation process has been set up in the months of February to April 2009 involving all major stakeholders in the Netherlands. As part of the process of developing the Dutch vision, six scientific “deskstudies” and two “factsheets” have been commissioned to relevant research groups associated with Wageningen University and Research Centre: Wageningen IMARES, LEI, Environmental Policy Group and Van Hall Larenstein. The results of the deskstudies are summarized under the headings Ecology, Economy, Management Strategies, Governance and Integration with other policies

## Ecology

The ecological aspects investigated in this study only related to the issue of **discarding**.

The definition of discards, used in this report is: “Discards, or discarded catch is that portion of the total organic material of animal origin in the catch, which is thrown away, or dumped at sea for whatever reason. It does not include plant materials and post harvest waste such as offal. The discards may be dead or alive.”

There are five different types of discards:

1. Discarding of undersized fish
2. Discarding of over-quota fish
3. Discarding of low value species
4. High-grading
5. Discards of non-commercial species

Each of these types of discards requires potentially different strategies for avoiding discarding.

In a recent (2005) FAO publication, the global summed discard rate is estimated at 8 percent, corresponding to around 7 million tonnes of discards. The North Sea accounts for the highest level of discarding in the world although some authors dispute the discards estimates from the FAO.

In the period 2002-2007, the overall catch of the Dutch beam trawl fleet consisted of 17-42% landings, 21-28% discards en 37-60% benthos en debris. The overall discard percentage in the Dutch pelagic fleet was highest in 2003 (17%) and between 6%-8% in the years 2004-2007.

The ecological impacts of discarding are two-fold: (i) a direct effect on the discarded species and (ii) indirect effects on species that utilise discards. The direct effects include a reduction in species diversity, changes in predator-prey interactions and changes in the relative abundance of species. Discarded fish in towed gear fisheries have a low survival (less than 10%). The indirect effects refer to the effects of discards on other species in the ecosystem. In the southern North Sea for example, discards contribute only 1–10% of the diet of benthic carnivores and demersal fish. But discards do appear very important as food for several seabird populations in the North Sea. Scavenging seabirds utilise around 70–92% of discarded roundfish, 20–35% of discarded flatfish and 3–17% of invertebrate discards. North Sea discards could potentially support over 6 million seabirds.

The European Commission stated in a 2008 non-paper that: “a new discard policy aims to remove the practice of discarding in (all) European fisheries. The overall objective of reducing unwanted by-catch and gradually eliminating discards should be achieved fishery by fishery, by using discard bans and supplementary measures to reduce by-catch” (EC 2008a). However, this non paper has not been taken forward into concrete policy plans.

In the EU-Norway agreement 2008, the Commission indicates that discards should be eradicated and a discard ban could be considered in the new CFP. The Dutch government has indicated that overall discards should be reduced by 50% in 2013 compared to 2007.

There are several gear and behaviour changes that could substantially reduce discarding. However, the key factor is not whether selectivity improvements can be achieved but whether the right incentives are in place to apply these more selective gears.

Discarding of fish, sensitive species (e.g. mammals, sharks) and benthos is by many regarded as an unethical way of operating. There is a strong societal pressure to reduce or eliminate discarding because of these ethical concerns. This creates an incentive for fishermen to implement methods to avoid discarding.

The economic “incentive to discard” is defined as the difference between the costs of landing and the costs of discarding. The economic incentive to avoid undesired bycatch is determined by the costs of changing from the present fishing method to a more selective fishing method, the costs of the changes in the catch composition and the reduction of costs associated with by-catch handling.

A discard ban as such is difficult to enforce and it will probably only be effective with a range of accompanying measures. For example, in Norway, the discard ban is not the central feature of the anti-discard policy. Central features are regulations increasing gear selectivity and the flexible closed area policy in combination with the obligation for fishing vessels to change fishing grounds when discard levels become too high.

Incentives to land over-quota by-catches can be increased by allowing fishermen to sell by-catches on the market and confiscating part of the revenues in such a way that fishermen are just compensated for landing costs (Deemed value approach, New Zealand).

Setting maximum discards targets is often seen as a potential element of “Results based management”. When promoting entrepreneurship, the preferred method would probably be setting targets by company and by year, so that efficient fishing plans can be developed and reviewed. Observer systems could be used to monitor the performance of the fishing fleet.

## Economy

The economic performance of European fleets is monitored by the STECF Working Group on the Preparation of Annual Economic Report (STECF 2009). The draft report of that group has not been agreed yet by STECF, but the conclusions from the report is that the EU fleet’s income appears to have increased slightly between 2003 and 2007. The total income generated by the EU fishing fleet was around 7.6 billion euros in 2007<sup>2</sup>. The outlook for 2008 and 2009 suggests deterioration in economic performance, although data are not yet available. The fuel crisis in 2008 raised operational costs significantly and raised serious concerns about the future structure of the EU fleet, particularly for vessels that are fuel inefficient. Fishing opportunities are reducing for a number of key stocks which will limit the earnings potential of large sectors of the EU fleet. And the global economic crisis in 2009 seems to be affecting the demand for seafood and thus fish prices.

The economic impacts of discarding in the Dutch beamtrawl fishery were investigated in Buisman et al. (2001). The estimated value of annual discards in terms of foregone future revenues from catches in the Dutch beam trawl fishery was estimated at 70% of annual landings value.

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<sup>2</sup> this figure excludes Denmark, Cyprus, Malta and Slovenia

## Management Strategies

### **Evaluation of fisheries policy**

Six reports that present some sort of a fisheries policy evaluation were reviewed. General conclusions are:

- There is no real systematic evaluation of policy although the studies by WWF and “Dutch rekenkamer” get close to such a policy evaluation because they address most aspects of fisheries policy and because they relate measures to goals.
- There is a distinction between policy review and policy evaluation. Most of the studies reviewed in this report are in the category of policy review.
- Causes for observed trends are both natural and human and to separate the two, the time frame for evaluation must be large enough.
- Given the complexity of the fisheries policy domain, sophisticated methods of evaluation are needed and could be adapted from other fields (Crabbe and Leroy 2008)

Gaps identified:

- The EC website does not provide clear links to evaluation of policy;
- Objectives and methods for evaluation are missing;
- Biological monitoring takes place through stock assessments with respect to reference points. The very short time frame (1 year) prevents an evaluative capacity and understanding.
- Economic evaluations are weak. There is no assessment of e.g. “overcapacity”
- Social evaluations are lacking.

### **(Dutch) Co-management**

The Dutch fisheries co-management system is a public-private partnership, using the capacities and interests of user-groups, complemented by the ability of the fisheries administration to provide enabling legislation and administrative assistance. The main effects of the Dutch co-management system are a better use of quota and increased compliance with the quota regulations and engine power limits. These were the initial reasons for implementing the system and it appears to be successful. The co-management system has to share the credit for this success with other developments such as intensified control accompanied by licensing, input management (maximum days-at-sea), and maximum gear width for double-beam trawls (Smit 1997). In fact, what is labelled a co-management system is in practice a mere ITQ management system. Hence the core of the system not a joint management of fish stocks but a decentralised effort of monitoring quota uptake and keeping landings in line with set TAC.

From the Dutch case we learn that co-management within the CFP is a viable option. Co-management is a specific local participatory arrangement fitting the local institutional setting. However, we also learn from the Dutch case that Dutch fisheries co-management is not so much a participatory interactive policy arrangement, with fishers actively involved in devising policies.

## Governance

Broadly speaking, governance describes steering or governing systems. There are two distinct definitions of governance:

1. **Descriptive.** The first definition stresses the **analytical description** of changes in locus and focus of governance. It describes the shortcomings of the nation state model and the emergence of new practices and arrangements in which policy and politics takes place. This definition is about rethinking the nation state model and the territorial order of policy making and politics.
2. **Prescriptive.** The second definition is about governance as a management model. In this model governance is about managing societal processes and to find solutions for unstructured or wicked problems in constructed policy networks in which public and private actors define problems and negotiate about possible solutions

Trends in fisheries governance:

- Fisheries management needs to relate to different policy arenas (cf. MSFD, Natura 2000, WSSD MSY-target). Maritime policy will challenge fisheries arrangements. Rules and discourses of other marine policy domains will affect the content and organisation of the CFP.
- This leads to discourse shifts: from fish stock conservation towards ecosystem conservation and from fisheries sector-based towards integrative marine policy. This means that fisheries governance will have to address:
  - participation, accountability and legitimacy
  - with more stakes and stakeholders
  - across sectors, levels and activities
  - across member states and regions
  - at an integrated (eco)system level

## Integration with other policies

Traditionally fisheries management in Europe is being shaped under the CFP. With the coming about of other, more environment oriented directives, such as the Birds and Habitat Directives, the Natura 2000 framework, the water directive and, off late, the Marine Strategy Framework Directive (MSFD) and the Maritime Policy, marine and maritime policy, influencing fisheries, is increasingly being shaped elsewhere. These (new) policies have a difference in focus (between economic and ecological aims), include different stakes (and hence stakeholders) and focus on different ways of setting rules (between challenging and integrative to instrumentally state imposed) (van Hoof en van Tatenhove, 2009). With for example the MSFD's objective of achieving good environmental status the sole competence of the CFP to manage fish resource conservation issues is terminated. Also, as we can witness in the Netherlands, the implementation of the policies seeking to regulate the marine environment are not necessarily controlled by the government body responsible for fisheries but by the ministry of water

management. As a consequence, the reform of the Common Fisheries Policy in 2013 will be placed in new legislative boundaries.

According to the MSFD, the formation of a coherent network of MPAs by 2012 should be achieved. Natura 2000 sites, which are part of the Birds and Habitat Directives, aim to establish a coherent European ecological network of special areas for conservation, based on specific habitat types and species. Member states should propose a list with selected areas and subsequently these special areas for conservation need to be assessed on Community interest before becoming official special areas for conservation.

The OSPAR convention also considers a network of MPAs. These OSPAR areas should create protective zones in the marine area, focusing on areas that possess a highly important range of species, habitats and ecological processes and areas where ecological processes are affected by human activity. A coherent network of MPAs should be established in 2010.

All environmental directives like the Birds and Habitat directives, the water framework directive, the Marine Strategy Framework Directive and the Maritime Policy during their process of implementation render attention to participation. However, emphasis is on information and consultation in the early steps of policy formulation only (the level of green and white papers). During operationalisation and implementation, environmental directives tend to be put into practice in a rather technocratic way. Environmental policies as for example the water and marine directives, are based on a scientifically derived definition of objectives to be achieved (good environmental status) These objectives result in the development of a set of indicators with which environmental processes are being monitored and managed. Operationalising the environmental policy is mostly perceived as a technical matter during which participation of stakeholders appears less needed.

We conclude that increasingly fisheries policy will be shaped elsewhere, mostly in environmental directives. The role of the fisheries sector in the development of these new policies is rather limited, due to the lack of participation in the development of these policies. In addition the fisheries sector is increasingly being confronted with more stakes and stakeholders. This reduces the overall significance of fisheries in the debate and steers the discussion towards a more environment-oriented discourse.



# Introduction

The European Common Fisheries Policy (CFP) is up for review and change in 2012/2013. The expectation is that this will entail a substantial reform of the policy. Preparations for the process of reform have (been) started by the release of the Green Paper by the European Commission in April 2009 (EC 2009).

The Dutch government aims to prepare a position paper on the future of fisheries management in the EU by September 2009. A broad and quick consultation process has been set up in the months of February to April 2009 involving all major stakeholders in the Netherlands (fisheries sector, non-governmental organizations, local authorities and consumers).

As part of the process of developing the Dutch vision, six scientific “deskstudies” and two “factsheets” have been commissioned to relevant research groups associated with Wageningen University and Research Centre:

- Wageningen IMARES
- LEI
- Environmental Policy Group, Wageningen University
- Van Hall Larenstein

The six deskstudies were:

**WP1: Evaluation CFP (national, international).** Bringing together results of previous analyses of the CFP and the effectiveness of fisheries management. Evaluation of scientific underpinnings of policy.

**WP2: Discards: how they occur, where and when.** Desk Study on the formation of discards, the different types of discards, the incentives for discarding and the measures in different regions taken to prevent discarding. Dutch situation regarding discarding. Recommendations for discards ban and studies of highgrading.

**WP3: Alternative management strategies.** Bring together results of analyses of alternative fisheries management in Europe and other parts of the world. Including comparison of TAC management and effort management.

**WP4: Governance and fisheries.** Evaluation of different arrangements for governance in fisheries management. Experiences from other areas. Experiences from recent innovations (e.g. RACs). Science-stakeholder interactions.

**WP5: Integration of environmental and structural policies.** Comparison of targets and measures of different policies (eg Water Framework Directive, Marine Strategy and others)

**WP6: The Dutch system of co-management and ITQs.** What is it and what are the effects on fish stock management and economic profitability.

In addition, 2 factsheets were prepared:

**WP7: Factsheet Dutch fisheries** and economic performance

The deskstudies have been carried out in a series of three workshops in the end of March and beginning of April 2009. Each workshop covered two workpackages and worked in a highly interactive and multidisciplinary way.

<b>Date</b>	<b>Subject</b>	<b>Organizer</b>	<b>Participants</b>
26-27 march 2009 Leeuwarden	WP2 (discards) WP3 (management strategies)	Martin Pastoors	Harriët van Overzee Jan Jaap Poos Tammo Bult Christine Röckmann Erik Buisman Nicole Westerwaal (LNV)
30– 31 march 2009 Wageningen	WP1 (evaluations CFP) WP4 (governance)	Luc van Hoof	Jan van Tatenhove Jan Willem van der Schans <sup>3</sup> Christine Röckmann Marieke Verweij Martin Pastoors <sup>1</sup> Wim van Densen <sup>1</sup>
1-2 April 2009 Wageningen	WP5 (integration) WP6 (co-management)	David Goldsborough	Luc van Hoof Ellen Hoefnagel Christine Röckmann Frederieke Vlek Martin Pastoors <sup>1</sup> Robbert Jak <sup>4</sup>
15 april The Hague	Presentation of results	Martin Pastoors	LNV staff Luc van Hoof David Goldsborough

This report provides a compilation and synthesis of the results of the workpackages. The sections of the report follow the themes that will be highlighted in the Dutch vision paper on the future fisheries management: ecology, economy, management strategies, governance and integration.

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# 1 Ecology

## 1.1 Discards

Discarding is an important aspect of many fisheries. The problems of discarding have been summarized as follows: “For hundreds of years, people have viewed negatively the concept of catching fish only for them to be thrown back, often dead, to the sea [...]. There is a widespread belief that high discard levels inhibit the sustainable use of marine resources, and several international agreements promote the development and implementation of technologies and operational methods to reduce discards” (Catchpole et al. 2005)

Kelleher (2005) reported that the North Sea accounts for around 900 Kt of discards which is 13% of global discards. Enever et al. (2009) further examined the source data of Kelleher’s North Sea discards estimates and found that 84% were fish, cephalopods and Nephrops discards and the remaining 16% were miscellaneous benthic invertebrates. These authors claimed that the total estimate of discards by Kelleher was probably too high, but they did not provide an alternative estimate.

The European Commission stated in a 2008 non-paper that:

*“a new discard policy aims to remove the practice of discarding in (all) European fisheries. The overall objective of reducing unwanted by-catch and gradually eliminating discards should be achieved fishery by fishery, by using discard bans and supplementary measures to reduce by-catch (EC 2008a).”*

However, this non paper has not been taken forward into concrete policy action..

There are various ways, reasons and incentives for discarding, and different types of discarding behaviour are associated with demersal and pelagic fisheries and with active and passive gears.

In this section, we will address the following issues: What types of discards exist? What is the overall magnitude of discarding and how does that affect the productivity of stocks or the functioning of ecosystems? What is known about the survival of discards? What are the impacts of discarding? What objectives have been expressed on discards? What are the incentives for discarding? How could gear changes affect the selectivity of fisheries? And what type of management measures have been or can be taken to change discarding behaviour?

### Definitions

There are many definitions regarding discards and by-catches which are not all mutually consistent. In this report we use the following definitions:

Discards	Discards, or discarded catch is that portion of the total organic material of animal origin in the catch, which is thrown away, or dumped at sea for whatever reason. It does not include plant materials and post harvest waste such as offal. The discards may be dead or alive. (Kelleher 2005)
By-catch	Part of a catch of a fishing unit taken incidentally in addition to the target species towards which fishing effort is directed. Some or all of it may be returned to the sea as discards or they may be landed if a market for these catches exists (Adapted from

	<a href="http://www.fao.org/fi/glossary/default.asp">http://www.fao.org/fi/glossary/default.asp</a> . Note that the term by-catch is traditionally used when describing incidental catches of marine mammals which could also be classified as discards.
Discard rate	The proportion (percentage) of the total catch that is discarded (Kelleher 2005). Note that discard rates can be calculated in different ways, e.g. using weights or numbers. Discard rates can be calculated within a species (e.g. discard rates of plaice as the proportion of plaice discarded from the total plaice catch) or over the whole catch (i.e. the proportion of discards from the total catch).
Catch	includes all living biological material retained or captured by the fishing gear, including corals, jellyfish, tunicates, sponges and other non-commercial organisms, whether brought on board the vessel or not. Plant material is not considered part of the catch (Kelleher 2005).
Landings	the portion of the total catch brought ashore or transhipped from the vessel (Kelleher 2005).

Discards can be further subdivided into five different categories (Buisman et al. 2001):

Discards of undersized fish	Discarding undersized fish is an important problem which is generated by a combination of mesh size and minimum landing size regulations.
Discards of over-quota fish	Inherent to quota managed multispecies fisheries: The quota for different species usually will not be exhausted at the same time and filling one quota will imply catching over-quota fish of other species which either has to be sold on the black market or has to be discarded.
Discards of low value species	The costs of landing exceed the costs of discarding for low value species.
High-grading	The discarding of a portion of a vessel's legal catch that could have been sold, so that a higher quality or larger grade of fish can be subsequently caught that brings higher prices. This may occur in any fishery, but the incentive to do so is particularly great with individual quotas (catch limitations). <a href="http://www.fao.org/fi/glossary/default.asp">http://www.fao.org/fi/glossary/default.asp</a>
Discards of non-commercial species	Refers to discarding of species for which no market exists.

### Overall magnitude of discarding

Kelleher estimated the global, summed discard rate of the proportion of the catch discarded at 8 % and used this to calculate the yearly average discard rate in the period 1992-2001 at around 7 million tonnes (FAO 2004; Kelleher 2005). This estimate was considerably lower than the previous estimate for 1988-1990 (Alverson et al. 1994), when worldwide discarding was estimated between 17.9 – 39.5 million tonnes. Alverson (1998) already indicated that the 1994 assessment was an overestimate. Figure 1.1 shows the estimated discards by large marine ecosystem (Kelleher 2005).

## North Sea discards

According to Kelleher (2005), the North Sea accounts for the highest level of discarding in the world: 900 000 tonnes (see: figure 1.1). However, some authors claim that Kelleher has overestimated the discarding in the North Sea (Eneever et al. 2009). Their claim is derived from the analysis of English and Welsh vessels and they state that "if similar new catch and discard data were made available from other North Sea fishing nations, an accurate and comprehensive update of Kelleher's estimates would be possible."

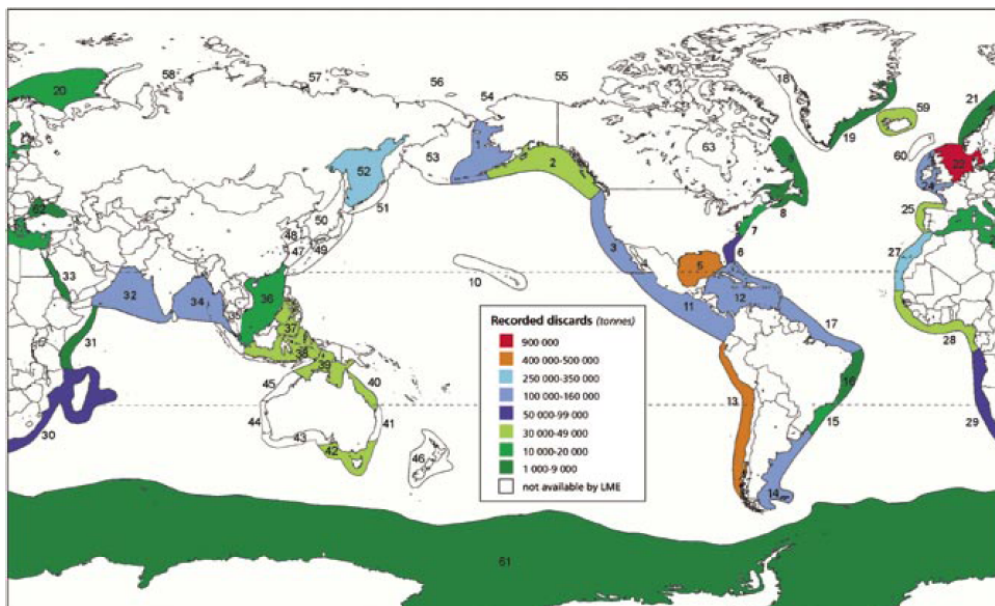


Figure 1.1: Estimated discards by large marine ecosystem (Kelleher, 2005).

### *Discarding in the Dutch beam trawl fleet*

The Dutch beam trawl fishery is one of the main fisheries in the Southern North Sea. Since 2002 a (limited) number of observer trips have been made onboard of commercial Dutch beam vessels (Van Helmond and Van Overzee 2007; Van Helmond and Van Overzee 2008; Van Keeken and Pastoors 2004; Van Keeken et al. 2004; Van Keeken and Pastoors 2005; Van Keeken 2006). The overall effort of the observer trips in the years 2002-2007 only represents between 0.1%-0.25% of the total days at sea of the Dutch beam trawl fleet (with an engine power larger than 300 HP and a mesh size of 80 mm). During the observer trips samples of discards and landings are counted and measured. Because of the low sampling coverage, discard estimates of the less abundant species are highly uncertain.

It is not possible to determine the discard percentage of benthos because benthos and debris are estimated together. Over the sampling period 2002-2007, the overall catch consisted of 17-42% landings, 21-28% discards en 37-60% benthos en debris. Dab was the most abundant species in the fish discards. In 2007 the common starfish, comb-star, swimming crab, sea urchin and brittle star were the most abundant benthos species. The average discard percentage in the period 2002-2007 for the plaice was estimated at 46-57% (in weight) and for sole at 10-17%.

The fleet composition of the Dutch beam trawl fleet is rapidly changing. Due to the high fuel costs and low fish prices, many vessels are changing to different types of fisheries (twinrigging, outrigging, etc) which were not covered in the discards sampling program. However, the new Data Collection Regulation, which has started in 2009, addresses some of these issues because more fleet segments will be covered in the discard sampling scheme. From 2009 onwards, the sector will start self sampling, which is expected to enhance the coverage.

### ***Discarding in the Dutch pelagic freezer fleet***

In European waters, freezer trawlers target pelagic species: herring, horse mackerel, mackerel, blue whiting, greater argentine and pilchard. Since 2002, 4-10% of the freezer trawler trips have been sampled (Van Helmond and Van Overzee 2009).

The overall discard percentage in weight was highest in 2003 (17%). However, the raised discard data for that year was only based on five trips. The overall discard percentages of the following years are estimated between 6-8%. Different species are targeted during different parts of the year (different fishing season). Consequently, within a season discard percentages of the target species are generally low (1-6%), but discards of non-target species can be very high (90-100% of the non-target species).

Apart from the routinely sorted discards, a part (or all) of the catch is sometimes released (discarded) before the catch has been sorted ("slippage"). Although slippage accounts for a relative large part of the total annual discard estimates (17%-40% in weight), incidents of slippage have not been frequently observed during the sampled trips (4%-8% of the sampled hauls). Species composition of the "slipped" catch is unknown within this fishery. Discard estimates per species are then only based on the sorted catch and are thus an underestimate. Mackerel was by far the most dominant species in the discards (between 16% and 37%); this species is discarded in all seasons and areas. The large price differential between small and large mackerel and a relatively small mackerel quota are the main reasons for this discarding behaviour (Borges et al. 2008; Van Helmond and Van Overzee 2009).

The monitoring of catches of cetaceans is integrated with the collection of discards data (Couperus 2008). For the period 2004-2006, incidental catches of cetaceans onboard Dutch pelagic freezer trawlers were monitored during 185 observer days during which 2 common dolphins and 1 white sided dolphin were observed (ICES 2008). In 2007, during 204 observer days no incidental catch of cetaceans was observed but 4 seals were caught during three incidents. It is possible that incidents of seals had occurred during the previous trips as well, but possibly they had not been reported properly due to unclear instructions (Couperus 2008).

Dutch freezer trawlers have exploited small pelagic fish in the waters off **Mauritania** since 1996. On average, six Dutch freezer-trawlers have been active in the Mauritanian Exclusive Economic Zone (MEEZ) year-round (Ter Hofstede and Dickey-Collas 2006). The seasonal and annual catches of this fishery were investigated. From 1999-2003, 16% of all fishing trips were covered. The amount of discards was less than 10% of the total catch by weight and consisted mainly of commercial fish species (Ter Hofstede and Dickey-Collas 2006).

Ter Hofstede et al. (2004) present all registered catches of the pelagic megafauna by the Dutch pelagic fleet in Mauritania during 12 pelagic trips in the years 1999-2003. During these 12 trips, catches of 31 ocean sunfish, 17 swordfish/marlins, 126 hammerhead sharks, 82 other sharks, 3 sea turtles and 21 dolphins were observed with certainty. Zeeberg et al. (2006) have shown that such catches are highest during the summer (July-November).

### **Survival of discards**

Several factors contribute to the mortality of discards during catch and sorting onboard. During the catching process animals may be injured by different parts of the gear. For the beam trawl fishery, discard mortality is mainly caused by the tickler chains and the injuries during the stay in the net. The processing on deck hardly affects the survival of discards (Van Beek et al. 1990). Less than 10% of plaice and sole discards in the towed gear fisheries survive the process of discarding (Bult and Schelvis-Smit 2007; Van Beek et al. 1990). Besides the fish that is discarded, an unknown quantity of fish slip through the meshes and are likely to be affected or die afterwards (Millar and Fryer 1999).

## Ecological impacts of discarding

The ecological impacts of discarding on the ecosystem include:

- (i) The direct effects of discard mortality, i.e., reduction in species diversity, changes in predator–prey interactions, changes in the relative abundance of species.
- (ii) The effects of population growth in species that utilise discards. In the southern North Sea it is estimated that discards contribute only 1–10% of the annual food demand for benthic carnivores and demersal fish (Catchpole et al. 2005). These authors further state that: “in contrast, discards are considered responsible for the growth of several seabird populations in the North Sea including the fulmar (*Fulmarus glacialis*), herring gull (*Larus argentatus*) and lesser black-backed gull (*L. fuscus*) [...]. Scavenging seabirds utilise around 70–92% of roundfish, 20–35% of flatfish and 3–17% of invertebrate discards [...]. It is estimated that North Sea discards could potentially support over 6 million seabirds [...].” (Catchpole et al. 2005)

## Policy objectives on discards

In April 2008 the **European Commission** presented a non-paper (EC 2008a) on the reduction of unwanted by-catch and gradually eliminating discards which is presented as an integral part of fisheries management and reaching maximum sustainable yield. Two fisheries are highlighted: the nephrops fishery and the beam trawl fishery. With regard to the beam trawl fishery the total discard rate is assumed to be 70% by weight and the discards of plaice are assumed to be 50% by weight. The Commission states that the maximum allowed limit of unwanted by-catch<sup>5</sup> for this fishery should be no more than 15% by weight and the maximum allowed by-catch for plaice should be no more than 15% by numbers. These maximum limits should be achieved within 6 years. The status of the non-paper in the EC policy making is presently unclear because no formal follow-up has been presented.

The **agreed record** between Norway and the European Community for (EU-Norway 2008) stipulates a number of intentions regarding the reduction of discards and highgrading. “...the Community Delegation stated that the objective should be to minimise and, through effective regulation, eradicate discards, including the consideration of a discard ban in the context of the review of the Common Fisheries Policy to be finalised in 2012.” Also, “the Community would ban high grading for its North Sea fisheries from 1 January 2009”. The agreed record also states that Real Time Closures (RTC) are “an important tool for protection of fish under minimum size.” A mandatory RTC system will be operational in the North Sea and Skagerrak not later than 1 September 2009 and the RTC should initially focus on protection of juveniles and undersized cod, saithe, haddock and whiting. No specific targets were mentioned for the North Sea flatfish species.

The **Dutch Minister** of Agriculture, Nature Management and Food Quality (LNV) indicated in the Dutch parliament in 2008 that from September 2009 onwards, real time closures will be part of the management tools for avoiding discards.

The **Dutch Biodiversity Policy Programme** 2008-2011 (NL 2008) has the target to reduce by-catches of non-commercial fish by 50% in 2013 compared to the known quantities in 2007 by further developing and using more selective fishing gear (e.g. pulse trawl). The negative effects of fishing on the bottom should also be significantly reduced by making sure that 40% of the current beam trawl fishers use different fishing methods in 2013.

The reduction targets on discarding are often not very clearly defined. They lack a reference situation or they do not specify for which species or species groups the targets apply.

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<sup>5</sup> Note that the EC document uses the term *by-catch* where according to the definition the term *discards* should be used.

## **Gear selectivity measures to reduce discarding**

There have been many studies focusing on technical adaptations to fishing gears with the aim to improve the selectivity. For example, the EU/Norway gear expert meeting in 2007 identified technical solutions for 15 cases in the North Sea and Skagerrak (2007). An analysis of the English and Welsh fishing fleet operating in the North Sea showed that the technical measures introduced into the North Sea have resulted in reduced capture of small fish where square mesh panels have been used and in significant reductions in discard rates when larger codend mesh sizes are in use (Enever et al. 2009).

In a study using 6 Dutch beam trawl vessels, Quirijns and Hintzen (2007) showed that an increase in mesh sizes from 80 to 90 mm would lead to a short term loss of about 50% of undersized sole and 32-47% of marketable sole (24-30 cm). They also showed that the amount of plaice discards in when using 90 mm was not lower than with 80 mm. Surprisingly, they found that fishing with 70 mm mesh lead to lower catches of marketable plaice. It is obvious that the short term effects of changing mesh size could be quite different from the long term effects, because in the longer term the increase in mesh size is expected to lead to a change in the population structure. This aspect has not been taken into account in the study of Quirijns and Hintzen.

Pulse trawl is an alternative to the traditional beam trawl and used for fishing flatfish. Research is ongoing on the catching properties of the gear with a special focus on the effects on cod, elasmobranchs and benthos. In an evaluation of the earlier finding, ICES (2006) concluded that the pulse trawl gear could cause a reduction in catch rate (kg/hr) of undersized sole, compared to standard beam trawls and that plaice catch rates decreased for all size classes. The gear seems to reduce catches of benthic invertebrates and causes lower trawl path mortality of some in-fauna species. Because of the lighter gear and the lower towing speed, there is a considerable reduction in fuel consumption and the swept area per hour is lower. However, there were also indications that the gear could inflict increased mortality on target and non-target species that contact the gear but are not retained. Therefore, ICES recommended additional trials to explore these effects.

The scientific literature on gear selectivity indicates that there are real potentials to improve selectivity. However, the key factor is not whether selectivity improvements can be achieved but whether the right incentives are in place to apply these more selective gears (Catchpole et al. 2008a). Graham et al. (2007) note that reduced fishing opportunities acted as a disincentive to North Sea fishers to use trawls with larger mesh. This is confirmed by Enever et al. (2009) who note that the average mesh size in the English and Welsh otter trawl fleet has been reduced since 2003. Suuronen et al. (2007) provided another example of poor incentives leading to significant short-term economic losses associated with a technical measure (the BACOMA panel) introduced into the Baltic Sea cod fishery. As a consequence, there was “adulteration of the panel, circumvention and non-compliance with the regulation.”

Examples of positive incentives for the application of more selective gears can be found in the development of certain excluder panels to reduce catches of turtles or large mammals (Zeeberg et al. 2006) or sieve nets to reduce discards in the brown shrimp fishery. Catchpole et al. (2008b) found a high level of compliance by skippers with the sieve net regulation despite a low level of enforcement. Sievenets reduced the unnecessary capture of unwanted marine organisms, but were less effective at reducing 0-group plaice which make up the largest component of the discards.

## **Incentives for (avoiding) discarding**

Apart from the legal and regulatory requirements for discarding (e.g. it is forbidden to have undersized fish on board), there are two main classes of incentives concerning discarding:

- societal norms and values that create incentives against discarding (also within the fishing sector)
- economic incentives for discarding.



### *Societal norms against discarding*

Discarding of fish, sensitive species (e.g. mammals, sharks) and benthos is often regarded as an unethical way of operating. There is a strong drivers to reduce or eliminate discarding because of these ethical concerns. This creates an incentive for fishermen to implement methods to avoid discarding.

### *Economic incentives for discarding*

The economic “incentive to discard” is defined as the difference between the costs of landing and the costs of discarding. Given the by-catch, a species or grade of a species will be discarded whenever (the perception of) the “costs of landing” will exceed (the perception of) the “costs of discarding”. The “costs of landing” of a by-catch includes preliminary fish processing, landing levies, auction costs and transport costs to the market. The “costs of discarding” include the forgone price received on the market, and the labour costs of separating discards from the other fish. In the long-term, the costs of discarding also include the foregone future revenues because of the decrease of fish stocks (target species or by-catch species) and degradation of ecosystem. For the individual fisherman these are external costs and will not have (much) impact on the individual decision to discard. In the case of highgrading the “incentive to discard” is largely determined by the price differential between low value grades and high value grades. Buisman et al. (2001) give examples of how economic incentives for discarding (highgrading and discarding of low value grades) can be calculated. These incentives are fluctuating throughout the year because they depend on prices.

The economic incentive to avoid undesired bycatch is determined by the costs of changing from the present fishing method to a more selective fishing method, the costs of the changes in the catch composition and the reduction of costs associated with by-catch handling.

## **Management measures to change discarding behaviour**

The main anti-discard policies applied in the EU are concerned with increasing gear selectivity by technical regulations (e.g. minimum mesh size regulations).

The effects of individual quota systems (IQ's) on discarding behaviour are ambiguous. Generally the effect is that fishermen tend to concentrate on the high-value grades of the quota species in order to maximize the value of their quota. In a mono-species fishery, Individual Transferable Quota (ITQ) may induce fishermen to use more selective gear and thus avoiding by-catch and discards of juveniles. In a multi-species fishery, ITQ systems may give fishermen incentives to high-grade or to discard over-quota fish, particularly where species have different minimum landing sizes.

The ongoing reduction of fishing capacity and effort in EU fisheries will reduce the incentives for high-grading and discarding of over-quota fish. It will probably also reduce the discard levels of low-value and non-commercial species as a side-effect of reducing total catches, but the effect on discards of juveniles is ambiguous. Effort reduction is expected to reduce total catches and therefore the total volume of discards. However, if effort is reduced too much, this may induce fishermen to use less selective gear in order to make sure that they can fill their quota, or they could limit their spatial extent and remain more in the coastal zone where juvenile fish often aggregate. This could increase the proportion and even the absolute level of juvenile discards (Buisman et al, 2001).

Possible management solutions to discard problems are related to the type of discarding. In table 1.1 five types of discard problems are presented and for each of these types, some measures are listed that (theoretically) might contribute to a solution of these problems.

Table 1.1 Five discard problems and possible solutions (adapted from: Buisman et al. 2001))

Discard problem	Possible solutions
Undersized fish	Increase selectivity Discard ban Seasonal quota Flexible closed areas Fixed closed areas
Over-quota fish	Effort reduction Discard ban Multi-annual quota Multi-species quota Deemed value approach, New Zealand
Low value species	Effort reduction Discard ban Development of markets Commercializing of by-catch (Bycatch bank, Iceland) (Kelleher, 2005)
High-grading	Effort reduction Discard ban Size-specific quota Value based quota
Non-commercial species	Adjustment of fishing gear or change of fishing method

Increasing selectivity by changing mesh size, type of gear or the fishing method. Much effort has already been made to increase selectivity. Problems with determining the most appropriate mesh size occur in multi-species fisheries where different species have different minimum landing size.

A discard ban is difficult to enforce and it will probably only be effective with a range of accompanying measures. The discard ban is for example not the central feature of Norwegian anti-discard policy. Central features are regulations increasing gear selectivity and the flexible closed area policy in combination with the obligation for fishing vessels to change fishing grounds when discard levels become too high. It is these regulations that prevent fishermen from catching high proportions of illegal fish (Buisman et al. 2001; EU-Norway 2008).

In New Zealand a partial discard ban is in place: all fish caught must be landed, except for the 11 species subject to a minimum landing size and for which discarding is tolerated. A tax has to be paid for any kg of fish sold over-quota, and that is referred to as the deemed value (Marshall, 2009 submitted). It is crucial that the remaining revenues for fishermen are just high enough to compensate for the incentive for discarding, but on the other hand, do not induce fishermen to target over-quota fish.

From the international experiences with by-catch and discard policies it appears that introduction of a discard ban only makes a difference in cases where this is complemented by other measures to reduce the catches of illegal fish to a minimum (Buisman et al, 2001) or where a discard ban is complemented with measures providing fishermen with incentives to land their by-catches (e.g. deemed value approach, New Zealand).

A seasonal quota might contribute to a solution because the catches of undersized fish fluctuate during the year. Lower quota during the spawning time could reduce the problem.

Flexible closed areas are also one of the more obvious solutions. A fixed closed area policy would concern closing the most sensitive nursery areas. A more sophisticated approach would be the introduction of flexible closed areas following the Norwegian strategy. This would imply close monitoring of the proportion of juveniles caught in each area and closing areas where this proportion exceeds a certain level. When the proportion of discards decreases the area can be reopened for the fishery again. This type of policy, however, requires intensive monitoring by inspection vessels and has in Norway lead to rather high monitoring costs.

Multi-species quota or multi-annual quota both have the effect of increasing flexibility and thereby reducing the chances that fishermen will be forced to discard over-quota fish. A related measure is quota-substitution as applied in Iceland, where quota for different species can be substituted in proportions based on the market prices relations. These arrangements still have the potential flaw that one species can 'traded' against another species, so that fishing pressure could be unevenly distributed.

Deemed value approach. Incentives to land over-quota by-catches can be increased by allowing fishermen to sell by-catches on the market and confiscating part of the revenues in such a way that fishermen are just compensated for landing costs (Deemed value approach, New Zealand). This has to be applied very carefully in order to prevent that fishermen get an incentive to target these by-catch species.

Develop a market for low-value species. This has been done with reasonable success in The Netherlands for species like dab and flounder. According to the interviewed fishermen, discards of these species have decreased significantly during the 1990s (Buisman et al, 2001).

Size-specific quota or value-based quota. If size specific quota can be enforced effectively, this will take away an important reason for discarding low value grades of quota species. The Norwegian "G6 regulation" for mackerel is an example of a size-specific quota (Buisman et al 2001). A system of value-based quota by definition takes away the incentive of maximizing the value of the quota catches and replaces it with an incentive to fish the quota at minimal costs (Turner 1997). This will induce fishermen to fish their quota with minimal effort. However, it might have an adverse effect on catches of juveniles because it may stimulate the use of less selective fishing gear or methods.

Discards of non-commercial (non-marketable) species are a major problem in the Dutch beam trawl fishery. Solutions for this problem will have to be found in changes of fishing gear or fishing method. One of the most promising alternatives for the beam trawl fishery is the pulse beam trawl. However, Van Densen *et al.* (2008) state that currently there is no obvious solution for the discard problems of undersized fish in the Dutch sole fishery. An increase in mesh size from 80 mm to 90 mm appears to have no effect on discards of undersized plaice. According to the authors, there is currently not enough information for introduction of seasonal closed areas. Closed areas are not an option because the distribution of juvenile plaice is unpredictable. In this specific case, the real challenge is to find a way to separate the catching of plaice and sole. We argue that with the increased societal pressure to reduce or eliminate discards, strategies will have to be found to reduce discarding in the sole fishery even if this would mean lower overall catches of sole.

Sometimes management measures have unintended consequences. Graham et al (2007) for example cite the following case: "To reduce cod mortality in the North Sea, mesh sizes were increased and effort restrictions introduced, but the measures also affected other fleets, notably those targeting Nephrops: fishers for that species reduced their mesh size to prevent loss of target species and to avoid effort restrictions. Although management measures may have resulted in reduced fishing mortality on cod, they placed additional pressure on other stocks by encouraging vessels to switch gears, and it is likely that discard rates have increased." Similarly, high-grading and over-quota discards are also examples of unintended consequences of management measures.

## **Future directions on discards**

Setting maximum discards targets is often seen as a potential element of "Results based management". The discussion on how to set those targets has not been fully thought through. We can imagine different options, e.g. setting targets by year, by trip, by sector, by company or by ship. When promoting entrepreneurship, the preferred option would probably be setting discard targets by company and by year, so that efficient fishing plans can be developed and reviewed.

Observer systems (either paid by the sector, paid by government or through camera observation) could be used to monitor the performance of the fishing fleet.

## 2 Economy

### 2.1 Economic performance of European fleets

The economic performance of European fleets is monitored by the STECF Working Group on the Preparation of Annual Economic Report (STECF 2009). The most recent draft report of that group has not been agreed yet by STECF, but the conclusions from the report are:

- EU fleet income appears to have increased slightly between 2003 and 2007. The total income generated by the EU fishing fleet was around 7.6 billion euros in 2007 (this figure excludes Denmark, Cyprus, Malta and Slovenia).
- In 2007 there were around 74,400 active vessels in the EU fishing fleet. While the number of vessels decreased in most member states between 2002 and 2007, fleet capacity, measured in kW and GT, has decreased at a much slower pace. It is not possible to quantify the extent of the decrease at EU level due to a lack of data for some member states.
- Employment in EU fisheries has also decreased, but again it is hard to quantify the extent of the decrease due a lack of data for some member states. In 2007, around 140,000 fishers were employed in the EU fish catching sector.
- Effort, measured in days at sea, has also decreased significantly in most member states fleets. The volume of landings has followed a broadly similar trend.
- Most fish prices have improved between 2002 and 2007, which has helped to keep landing values stable in the light of declining landing volumes..
- Overall, the EU fishing fleet appears to be profitable. Profitability, cash flow and value added appear to have improved between 2002 and 2006. The data suggests that there was a slight downturn in economic performance in 2007 compared with previous years, particularly in the member states of the EU15. It is not possible to quantify the extent of these changes at EU level due to missing or incomplete data.
- Although 2008 data is not yet available and at the time of writing the report, we were only three months into 2009, the outlook for both years suggests deterioration in economic performance:
  - The fuel crisis in 2008 raised operational costs significantly and raised serious concerns about the future structure of the EU fleet, particularly for vessels that are fuel intensive.
  - Fishing opportunities are reducing for a number of key stocks which will limit the earnings potential of large sectors of the EU fleet.
  - The global economic crisis in 2009 seems to be affecting the demand for seafood and thus fish prices.

## 2.2 Economic impacts of discarding

Because generally a large part of the discards will not survive the catching and sorting process, this leads to substantial foregone future yields. Buisman et al. (2001) used discard estimates of the Dutch beamtrawl fishery in 1976-1990 as input for the calculation of the value of discards. The calculation was made on basis of prices and landings statistics in 1998. The estimated value of annual discards in terms of foregone future revenues from catches in the Dutch beam trawl fishery was estimated at 70% of annual landings value (Buisman et al. 2001).

## 3 Management Strategies

Chapter 3 is subdivided into two sections. Section 3.1 deals with the concept of policy evaluation. A range of studies treating the EU Common Fisheries Policy – reviews, reflections, evaluation attempts – are presented and discussed. Section 3.2 then depicts and reviews the Dutch fisheries co-management system.

### 3.1 Evaluation of fisheries policy

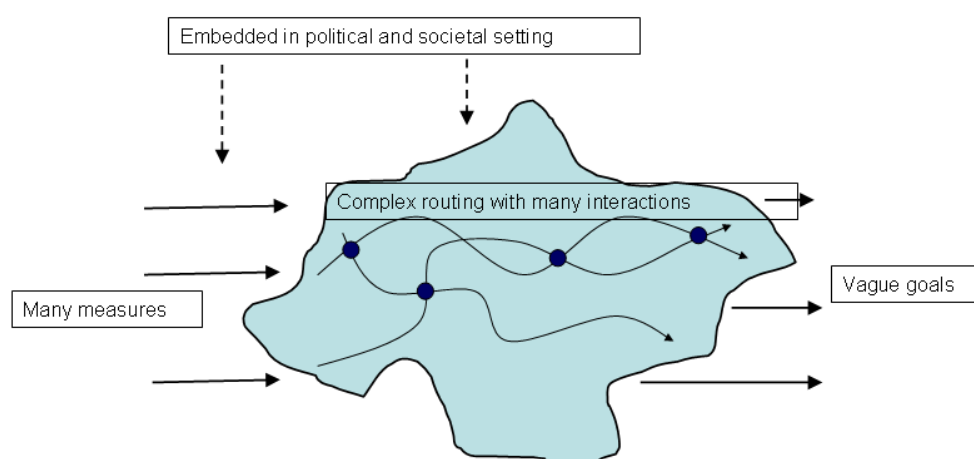
#### 3.1.1 Theoretical background

The basic question of this study is: what can we learn from previous analyses of the Common Fisheries Policy regarding the effectiveness of fisheries management?

The prevailing opinion on the CFP is often phrased something like this:

*“It is widely accepted by fishermen, environmental groups and the European Commission itself that the CFP has failed to conserve fish stocks and that the current review is necessary”* (Wales Members Research Service 2003)

The question that arises is: on what basis is such a conclusion drawn and what type of evaluation has been carried out? Effectively we are addressing complex evaluations where the relationship between the measures and the effects can take many different pathways and are not always clear.



Ideally, a policy evaluation is a transparent way in which the management body accounts for the effectiveness of measures taken in a participatory setting. The evaluation should be available to all stakeholders (fishers, NGOs, civilians...) and should show whether the goals have been reached through the measures taken.

There are different types of evaluations:

- ex ante (=before); This is the type of evaluation that often takes place in fisheries management. For instance: the outcomes of the flatfish recovery plan were simulated by modelling beforehand. So far, these evaluations are mostly associated with biological models of options and harvest control rules. Input of environmental, economic or social factors is limited.
- ex nunc (=during); monitoring and assessment. Examples of ex-nunc evaluations are the “milieubalans” and “natuurbalans” provided by the Netherlands Environmental Assessment Agency.
- ex post (=after); although there are very few ex-post evaluation of fisheries management, there are many examples of ex-post policy evaluations in environmental policy and other fields:
  - Region oriented policy in the Netherlands (Boonstra 2004; Glasbergen and Driessen 1993; Padt 2007; van Tatenhove 1993)
  - Infrastructural projects (Meijerink 2005; Pestman 2001)
  - Subsidies (Vermeulen 1992)

Evaluations should adhere to the principles of good governance: participation, transparency, accountability, effectiveness, coherence. It is surprising that these type of evaluations have not been applied to fisheries policy in a formal sense.

### 3.1.2 Examples of “evaluations” of fisheries policy

We reviewed a number of reports that attempt to review or evaluate the Common Fisheries Policy:

- Sissenwine and Symes (2007)
- UK House of Lords (2008)
- Royal Society of Edinburgh (2004)
- Van Densen & Overzee (2008)
- Netherlands Court of Audit (2008)
- WWF (2007)

The above reports are often mostly reviews, and no formal evaluations of the Common Fisheries Policy. In reviews, the current state of the system is described but without an explicit link between measures and goals.

## **1. Sissenwine & Symes (2007) "Reflections on the CFP"**

The Commission asked two external experts (a natural scientist and a social scientist) to reflect on the CFP as part of the Commission's internal review process. The report is not publicly available and therefore unofficial, but it is widely used and cited. The two authors have produced two parts with little overlap. There is no synthesizing discussion, but only a summary of conclusions and recommendations. The document does not constitute a systematic evaluation.

### *Part 1 (Sissenwine)*

- Review (critique) of CFP objectives and its operational guidelines
- How well is the CFP working? Evaluation of performance with respect to stock status, capacity, fleet profitability, by comparing with other fisheries management frameworks.
- Conclusion and suggestions to improve

Sissenwine focusses on "challenges, performance and the future" of the CFP. He reviews goals and objectives of the CFP and compares them to other fisheries management frameworks. He concludes that the CFP has vague objectives and lacks operational guidelines for implementation.

Sissenwine emphasizes the priority need for conservation and criticizes the CFP's situation of poor decision making relative to this conservation need: "Decision makers should understand that conservation is a priority and the social and economic objectives of the Policy are dependent on conserving fish stocks in the long term."

The sections on performance of the CFP resemble an evaluation, but it is not always clear what performance scale the judgment was based on. Additionally, Sissenwine comments on the scientific advice and services. He claims that "[i]n most cases, scientific advice and services that support fishery management are adequate, and if the advice had been followed many of the current resource problems could have been avoided." (p.29).

Sissenwine's conclusions on what has gone wrong:

- lack of transparency
- blocking minority
- Subsidiarity (impedes the command and control form of fisheries management because the Commission can only command management but it does not control implementation).
- Relative stability
- Centralisation in Brussels

Sissenwine's suggestions on how to improve:

- Operationalise vague objectives
- Increase transparency
- Share responsibility for management by spreading the "risk" (RACs, multi-year frameworks, commission working groups)
- Implement the Ecosystem approach
- Strategic, interdisciplinary science support
- Political will



*Part 2 (Symes):*

- Questioning the raison d'être of the CFP
- Elaborating on the CFP governance system
- Realigning the goals: Sustainable development, MSY, socio-economic dimensions
- Integrated management, Ecosystem based approach to fisheries management (EBAFM)
- Rebalancing roles/responsibilities between EU, MS, private sector.
- Relative stability: described as "the obstacle"

"In some important aspects... the CFP is no longer fit for purpose. It fails to connect with the fishing industry and ... the industry becomes less convinced that it can deliver the desired outcomes. There is a growing problem of communication, notwithstanding the advent of RACs: the messenger (DG Fish) is seen as too insular and the message, in terms of policy objectives, is opaque, its syntax confused. There is urgent need for change."

*Conclusions on the report by Sissenwine and Symes 2007*

Two types of conclusions are drawn in the paper :

- Judgments, based on comparison of the European situation to other management systems. Part 1 is based on an expert opinion, that starts with reviewing the objectives, compares achievements to other systems' achievements, and concludes with recommendations. Part 2 is not an evaluation but rather a reflection on whether the CFP is managed by the principles of good governance
- Recommendations how to improve, like: operationalise vague objectives, increase transparency and share responsibility for management by spreading the "risk".

***2. UK House of Lords (2008) "The Progress of the Common Fisheries Policy"***

The review is based on a parliamentary hearing with around 40 "witnesses": EC, politicians, fishing industry, NGO's, scientists.

Topics are structured in two headings:

- Review:
  - Recovery and management plans
  - Structural policy
  - Control and enforcement
  - Regional Advisory Councils
- Ongoing challenges
  - Management tools
  - Discards
  - Rights based management
  - Governance

The types of conclusions resemble high level ambitions and intentions rather than evaluations. The UK House of Lords 2007 report is:

- Not a formal evaluation because there is no specific reference to objectives, means and achievements
- A transparent process through public hearings and expert opinions
- Partly backward looking, partly forward looking.

### ***3. Royal Society of Edinburgh (2004): Inquiry into the future of the Scottish Fishing Industry***

Background to the study is that the demersal whitefish sector was in trouble (especially cod fishermen) and that there had been multiple inquiries into the UK fishing industry, but so far none had specifically focused on Scotland.

The independent inquiry was based on different views and disagreements amongst stakeholder groups. The goal was to analyse the causes of crisis and outline realistic options for future.

Many topics were covered. From an evaluation perspective the two topics that are most relevant are:

- Science of stock assessment and its role in fisheries management: “this inquiry has attempted an evaluation of this science”. Some defects in scientific methods were observed. The conclusion is that fishing effort has been too high for much of the last 20 years in combination with erroneous ICES advice and a minor contribution of low recruitment.
- A sustainable future for the industry: “What has been wrong with the policy” and “What needs to be done now”. Decision making (Council of Ministers) is too centralised and too slow. Little account of socio-economic consequences and of advice from industry. TACs and quotas are unsatisfactory measures for the demersal sector resulting in discards. The report argues (1) for effort control instead of TACs (but not for pelagic sector where TACs and quotas seem to work well) , (2) for a discard-ban and (3) Industry should be more involved in management and stock assessment exercises.

#### *Conclusions on Royal Society of Edinburgh (2004)*

The report does not constitute a systematic evaluation because the criteria for evaluation are unclear, e.g.: “the CFP has failed to achieve adequate conservation of certain key fish stocks”. The basis for concluding that human causes had greater impact than natural causes in the cod decline is unclear. The report highlights some critical issues of the CFP from a Scottish perspective and provides a number of recommendations

### ***4. Van Densen & Van Overzee (2008): 50 years' fisheries and management at the North Sea***

A report of Wageningen University in the series “Wettelijke Onderzoekstaken Natuur & Milieu” (Legal Research Assignments Nature and Environment). The report provides:

- Overview of input and outcomes of North Sea Fisheries and management
- Focus on question whether North Sea Fisheries management has been effective in the way that this is generally understood

The authors do not answer the above question directly but only implicitly. Three reasons why cause-effect relationships in fisheries are difficult to define:

- Policy measures are introduced gradually and stepwise
- Delay of response of fish stock to measure taken (time lags)
- Natural variation (especially year class strength) masks effects of measures

According to the authors, the fisheries management system is characterized by the following properties:

- Focus on yearly TAC-circus creates lack of time for long term management (based on informative past)
- Little evaluative capacity which makes it difficult to distinguish between natural and human causes
- Lack of clear and accessible information on fish stocks and fisheries hampers a productive debate

*Conclusions on Van Densen & Van Overzee (2008)*

- Very thorough and valuable overview, but not a systematic evaluation because it does not (and cannot) compare the realizations with the (unspecified) objectives of fisheries management in a transparent way.
- Authors say to focus on question whether North Sea Fisheries management has been effective in a way that is generally understood. This question is not answered directly.

## **5. NL Court of Audit (2008) “Duurzame visserij”**

The report was an initiative of the Dutch Court of Audit (Algemene Rekenkamer, Tweede Kamer der Staten-Generaal). Main questions:

- Have the Netherlands achieved their fisheries management goals?
- Have the CFP sustainability goals be reached?

The analysis is limited mostly to the Dutch beam trawl fishery. The topics covered in the report are:

- Effectiveness of TACs, quotas
- Effectiveness of enforcement and control
- Effectiveness of decommissioning
- Effectiveness of innovation
- Financial state (NL)

The report concludes:

- From ecological perspective, ambitions have not been achieved. Economic goals dominate. Consequence: both ecological and economic deterioration of the sector. Reasons for conclusions: TAC recommendations based on economic instead of ecological concerns.
- Other topics: no evaluation possible due to lack of data

*Conclusions on NL Court of Audit "Duurzame visserij"*

- The report is close to a systematic evaluation. It reviews the objectives, has stakeholder input and used literature studies.
- The objectives are not directly compared to outcomes. Data and method of evaluation are not presented.
- Conclusions and recommendations for adjustment are given. The reasons for the conclusions are presented.

**6. WWF (2007) "WWF Mid-Term Review of the EU Common Fisheries Policy"**

The report was commissioned by a stakeholder organization (WWF) and carried out by an independent research organization (MRAG, London). It consists of a single report with no explanation of the process of evaluation.

Topics:

- TAC setting process
- Multi-annual management/recovery plans
- Ecosystem-based fisheries management
- EU relations with RFMO's
- Regional advisory councils
- Fishing capacity

An example of the type of evaluation in the report is the evaluation of the TAC setting process where the following questions were addressed:

- How were EC proposals compared to scientific advice?
- How were TACs set relative to EC proposals?
- How were quota fished relative to agreed TACs

Not included in the report: What were the effects of measures to reduce fishing mortality and thus to improve stock status?

The report developed a score-card that provides a very useful summary of the progress towards key CFP commitments (see example, figure 3.1, below):

<p><b>Article 4.</b> ... Council shall <u>establish measures governing access to resources ... taking into account available scientific, technical and economic advice</u> and in particular of the reports drawn up by the STECF as well as in the light of any advice received from RACs...</p>	<p>TACs and quotas set each year by Council, but frequently in excess of the ICES advice and of Commission's proposals.</p>
<p><b>Article 20(1).</b> The Council, acting by qualified majority on a proposal from the Commission, shall decide on catch and/or fishing effort limits and on the <u>allocation of fishing opportunities</u> among Member States as well as the conditions associated with those limits. Fishing opportunities shall be distributed among Member States in such a way as to assure each Member State <u>relative stability</u> of fishing activities for each stock or fishery.</p>	<p>TACs are set each year by Council, and divided as quota between Member States. Relative stability is achieved in terms of distribution of TAC shares between Member States, but not in terms of maintaining sustainable fish stocks or catches.</p>
<p><b>Article 23(4).</b> When the Commission has established that a Member State has exceeded the fishing opportunities which have been allocated to it, the Commission shall operate <u>deductions</u> from future fishing opportunities of that Member State.</p>	<p>Deductions applied in relevant cases, for example, to UK and Ireland regarding their 2007-2012 quota allocations for herring and mackerel (CEC, 2007e).</p>

**Figure 3.1: Example of Scorecard in the WWF Mid-Term Review report to compare objectives with realizations.**

The conclusions in the report are formulated as high level recommendations or ambitions

*Conclusions on WWF 2007*

- Close to a formal evaluation. It provides a review of objectives and realization using indicators developed during the review process.
- Evaluation process itself is not transparent or participatory although the report is publicly available

**General conclusions**

An overview of the six evaluation reports and their description is presented in the table below.

Report	Description
Sissenwine and Symes 2007	2 experts (natural and social scientists) reflecting on the CFP
UK House of Lords 2008	Public hearing based on expert opinions
Royal Society of Edinburgh 2004	Defining some critical issues of the CFP from a Scottish perspective + some recommendations
Netherlands Court of Audit 2008	Evaluation of the Dutch beam trawl fishery management within the CFP
Van Densen & Overzee 2008	Overview and critical notes on weak information basis in fisheries policy
WWF 2007	Expert review report using partly quantified metrics

- There is a distinction between policy review and policy evaluation. Most of the studies reviewed in this report are in the category of policy review.
- There is no real systematic evaluation of policy although the studies by WWF and “Dutch rekenkamer” get close to such a policy evaluation.
- Causes for observed trends are both natural and human. To distinguish the two, the time frame for evaluation must be large enough.
- Given the complexity of the fisheries policy domain, sophisticated methods of evaluation are needed and could be adapted from other fields (Crabbe and Leroy 2008).

Gaps identified:

- The EC website does not provide clear links to evaluation of policy.
- Objectives and methods for evaluation are generally lacking in the CFP.
- Biological monitoring takes place through stock assessments with respect to reference points. The very short time frame (1 year) prevents an evaluative capacity and understanding by learning from history.
- Economic evaluations are weak. There is no assessment of e.g. “overcapacity”.
- Social evaluations are lacking.

## 3.2 Dutch co-management system

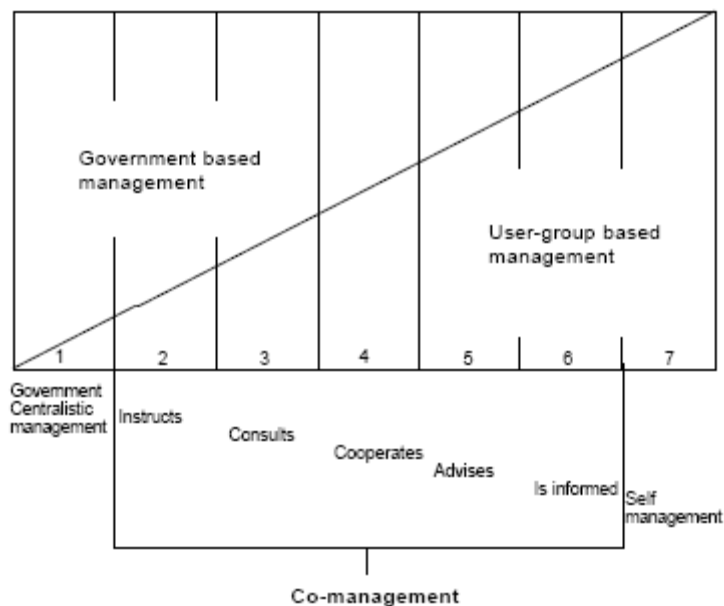
For the fishing industry, the combination of high levels of uncertainty and a lack of assurance of their rights to resource use encourages a race for fish. The race creates an incentive to emphasize short-term gains and de-emphasizes long-term incentives for stewardship (Hanna 2001). The core question in fisheries management, as in other environmental and resource dilemmas, therefore is how to bridge the gap between private decisions and societal and environmental impacts (van Hoof forthcoming-b). Following Libecap (2009), the disparity between private and societal costs and benefits of exploitation of fish stocks results in externalities (harmful effects to third parties), in this case: overfishing. The absence of information about an alternative resource use (opportunity costs) results in a wasteful misallocation of resources (ibid).

The resulting declining fish stocks have led governments over the years to deploy traditional government top-down measures, such as limiting overall catches by setting limits to total landings, fishing effort and access, including vessel and gear restrictions, area closures and days-at-sea constraints. These limitations have led to an economic inefficient and overcapitalised fishery and, still, a remaining pressure on the resource.

In order to overcome the inconsistency between fish stocks and capacity, property rights have been introduced in some fisheries. Rights Based Management (RBM) evolves around ‘a formalised system of allocating individual fishing rights to fishermen, fishing vessels, enterprises, cooperatives or fishing communities’ (EC 2007a) . As such, the main types of RBM systems are: limited non-transferable licensing (LL); limited transferable licensing (LTL); community catch quotas (CQ); individual non-transferable effort quotas (IE); individual transferable effort quotas (ITE); individual non-transferable catch quotas (IQ); vessel catch limits (VC); individual transferable quotas (ITQ) and territorial use rights in fisheries (TURF) (MRAG et al. 2009).

Although occasionally the use of RBM instruments coincides with a form of participatory management between sector and government, co-management is not synonymous to rights based management. The fact that Member States have a degree of freedom in operationalising the CFP regulations results in European fisheries management to take different national manifestations and different ways in which responsibilities in management are shared between EU, national authorities and stakeholder groups. In recent years the concept of 'co-management' has been widely recognised as a promising option for reform of fisheries governance institutions. In fisheries, co-management is commonly defined as a dynamic partnership, using the capacities and interests of user-groups, complemented by the ability of the fisheries administration to provide enabling legislation and administrative assistance (Van Hoof et al. 2005).

Co-management can be classified into five broad types: instructive, consultative, cooperative, advisory and informative (Nielsen and Vedsmand 1999). The classification is based upon the balance in the roles that both government and user-groups play. It covers various partnership arrangements, degrees of power-sharing and the integration of user-groups. Co-management can thus be viewed as a set of institutional and organisational arrangements (rights and rules) which define the cooperation between the particular fisheries administration and its related user-groups. These arrangements are influenced by at least four conditions: (a) the existing property rights structure (how access rights to the resource are defined), (b) how and to what extent user-groups are involved in the decision-making process, (c) which user-groups are represented in the decision-making process and (d) the appropriateness of management institutions (e.g. state, regional or local bodies and/or private sectoral organisations) (ibid.).



**Figure 3.2: Typology of co-management arrangements (Nielsen and Vedsmand 1999)**

The advantage of approaching fisheries management as a bottom-up participatory process versus the traditional centralised top-down system is perceived to be a high degree of acceptability and compliance with regulation measures, due to the participation of user-groups in the decision-making and implementation process. As a result this could lead to increased efficiency, equity and sustainability in fisheries management and a reduction of administration and enforcement costs (Nielsen and Vedsmand 1999).

In this report we will analyse the Dutch system of co-management. In the next section (3.2.1) we will present a short historical overview of the Dutch fisheries management system with aspects of RBM (ITQ system) and co-management. In section 3.2.2 we will present the results of the reviews of the Dutch co-management system in 1996, 2002 and 2008. In section 3.2.3 we will draw some conclusions as to the effects and impact of the Dutch co-management system as well as looking into broader lessons that can be learned from the Dutch example.

### 3.2.1 A short history of Dutch co-management and rights-based management

To appreciate the Dutch co-management system, one has to comprehend also the, partially simultaneous, development of the ITQ system in the Netherlands. Since 1977, a RBM system evolved from an IQ system towards an ITQ system. Then in 1993 a co-management scheme for the cutter sector came in place. This co-management scheme was especially developed for the management of the use of ITQs. Since 2006 the co-management system has been extended by dividing responsibilities between government and fishing sector concerning the management of engine power. Below a more detailed description of this development.

In table 3.1, you will find the main steps in the development in the Dutch co-management system over the past three decades in chronological order.

Since 1975 the European system of TACs has been expanded to more than 20 species (22 in 2004), since fishing pressure became more severe in the last decennia. The Dutch receive their national share of these TACs. In the Netherlands, the system of Individual quota was introduced in 1976 and the flatfish quotas formally were only transferable together with a vessel. Soon however it proved to be possible to circumvent this rule and an informal IQ trade system evolved. In 1985 quotas became detached from vessels and officially transferable: ITQs.

Nowadays Dutch fishermen consider their individual fishing rights (which is a percentage of the national quota for a certain species) as private property. But before fishermen's acceptance, the quota system met a period of strong resistance, with the development of grey and black markets, confrontations with the Inspection Service assisted by the Riot Police Forces. The political problems finally resulted in the resignation of the responsible Minister.

The corporatist institution<sup>6</sup>, the Fish Commodity Board (Productschap Vis) lost its grip on sectoral policy making during the turbulent decennia in which fishermen did not comply with the quota regulations (1975-1990). This left a vacuum for policy mediation between government and the sector. After the resignation of the minister in 1991 a steering committee was established to address the issue of non-compliance and the bad relation between government and the sector. This led to the introduction of a set of diverse management tools, developing into the co-management scheme. The key ideas of the new management scheme were 1) sharing of responsibilities between government and fishing industry especially concerning the management of ITQs and 2) cooperation between fishermen. In February 1993, the co-management system was started.

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<sup>6</sup> Neo-corporatist institutions in fisheries (but also in agriculture and many other sectors) in which government and organised interests (mainly trade unions and employer associations) jointly develop and implement socio-economic policies. The government does not operate at a distance and organised interests do not have to lobby; they are welcome partners at the table (Hoefnagel 2002, van Hoof et al, 2005). There is tripartite consultation at all stages of legislation and policymaking. Often this is institutionalised in advisory bodies, but much coordination takes place in an informal way (van Hoof, forthcoming b).



**Table 3.1: A chronology of Dutch co-management and RBM in the Beam trawl fisheries**

<i>Circumstances</i>	<i>Developments</i>
	1975: TACs set conservatively by EU, catches of plaice and sole had to decrease by 10 and 40% respectively
Over fishing. Decommissioning, however high prices for sole and plaice lowered interest in decommissioning. Still 11% decrease of total amount of HP, because of decommissioning. [165 Boats were laid up.] Legal disputes.	1975/6: During these years weekly catch quotas, and monthly engine power quotas. During a period, only vessels with an odd vessel number are allowed to fish; the other week the even numbers. Government delegated the management of the quotas to the Fish Commodity Board. Installed quotas and tie-up regulations. The Board was unsuccessful. Government took over. Fishing was closed due to national quota exhaustion in 1975.  Decommissioning scheme.
Race to fish due to the fear of being shutdown when national quota was exhausted. Lower TACs coupled with large investment debts and low profits. Legal disputes.	<b>1976 Individual quotas not transferable.</b> (only transferable in combination with the vessel in practice). Allocated through 'grand fathering' principle. A limited part of the quota was kept as national reserve to compensate for eventual excess landings. Poor enforcement and monitoring.
By-catch problems. By 1980, cutter fleet doubled in size and its capacity increased by 60%	1977 reallocation of quota (no transferability)
Fishermen still over fish their quota, but are trying to buy quota. Or otherwise rent or hire quota. Surge in investment before a capacity freeze is in place. Investment 1979-87 led to a 90% increase in beam trawl capacity. This was also stimulated by the Legal Investment Regulation for Dutch enterprises (WIR). Trade in licences starts. Cod by-catch problem.	<b>1985 Quotas become officially transferable.</b> Difficulties to enforce quota and to control effort. License system introduced in 1985 to limit capacity (total HP). To lower effort cutters, are required to tie up for 10 weeks/year in 1986. In 1987, this changed into a days at sea regulation dependent on size of quota and HP. Maximum beam width and a maximum individual capacity limit of 2000 HP in 1987.  Sole and plaice fishermen are allowed to fish 20% of the national cod quota.
Larger investments in quota. Rent and hire market for quota. Some fishermen still exceed their quota.	1988 systematic control of landings of quota species. 1990 Minister of Fisheries, Braks, resigns because of exceeded quota for sole. 1990 sole TAC raised
1989-1992 fleet decreased by 13%, due to a decommissioning scheme of the EC and Dutch government (MAGP), also due to flag switching. Number of enterprises decreased. Because of investments in quota, interest of most fishermen in monitoring quota increases.	Lower effort and capacity. Improvement of monitoring and enforcement.
1993 co-management. Fishermen form groups, make fishing plans, agree on a voluntary auction duty and make it easy to rent and hire quota. They also agree on a penalty system.	Government and industry co management of quota. Government remains responsible for national quota not to exceed. Government has monitoring task.  New Agent: Group Board, has also monitoring tasks.
No exceeding of quota 1993-2002. Discarding of small fish, (unproven)? High-grading (unproven)?	Government satisfied.

<i>Circumstances</i>	<i>Developments</i>
Some fishermen do not have enough days at sea to fish quota full. Future trade in days at sea?	1998/1999 Discrepancy between quota and days at sea due to EU. According to the Dutch, MAGP fulfilled, according to EU not.
Fishermen's representatives participate in New Steering group (Commissie Nijpels)	2002 New Steering group to find out whether groups may extend their responsibilities.
<i>Transition phase.</i> Fishermen exceed 300 HP	2005 extension of co-management; Engine power reduction of vessels with too much engine power

In this Dutch co-management system, responsibilities of the management of individual quota have been devolved to groups of fishermen. These groups are formally independent legal entities. It is mandatory for the chairman of the group to be a person without interests in the fisheries sector. All group members have to be member of the same Producers Organization [PO]. In daily practice the functions of POs and co-management groups are often carried out by the same staff. The secretariat of the groups is carried out by or on behalf of the Fish Commodity Board.

The aim of the co-management groups is to maximise economic results on the basis of joint management of the individual quota of group members. Objectives are to guarantee a consistent fishery policy as well as to improve durable exploitation of the available fish stocks in an economic responsible way. Other aims are to install manageable fishing systems, ensure group members to operate in line with private and public law and to be responsible for management of quota for sole and plaice and eventually other fish species.

The group tries to reach its goals by designing fishing plans; by enforcing regulations; by arranging arbitration; by imposing sanctions; and by organizing smooth intra- and inter group ITQ transfers. Every group member has to sign an agreement comprising of the following obligations to:

- prepare an annual fishing plan.
- sell catch at approved auctions.
- make available logbook statistics (VIRIS) and Fish auction data to the management board of the group.
- pool individual quota for group management.
- assure for payments of penalties;
- authorize the group management board, the Fish Commodity Board and the General Inspection Service (AID) to inspect individual catch data.
- pay penalties imposed by the group management board. And, in case of exceeding individual quota (rented quota included), to pay to the group the gross proceeds.

The group management board is responsible for management of the pooled quota. The board is entitled to impose penalties/fines and sanctions, including the closing of fishing activities for the group or a group member. Fines have to be appropriated in such a way that in the end the transgressor is never favoured.

The government remains responsible for controlling the national quota and tasks pertaining to the CFP. The central government institution dealing with fisheries management is the Directie Visserijen, Ministerie van Landbouw, Natuur en Voedselkwaliteit (Fisheries Directorate of the Ministry of Agriculture, Nature and Fisheries). Within this ministry there is the Algemene Inspectie Dienst (General Inspection Service), which monitors fishing activities and has legal powers to lead violators to court.

### 3.2.2 Reviews of the Dutch co-management system

An evaluation of the system in 1996 concluded that the combination of positive inducements and some coercion made individual fishermen decide to become and remain cooperative. In general, the fleet succeeded in a more economic use of the quota and the distribution of net benefits had improved to some extent (Smit 1996). Both fishermen and government were enthusiastic about the management system (Hoefnagel and Smit 1997).

In January 2002 a Steering group (the Nijpels commission) started to investigate the possibilities to extend the Management responsibilities of the co-management groups. Fishermen at that stage were not enthusiastic to expand their responsibilities without having any influence on decision-making. Ed Nijpels, the chairman of the commission looking into a recalibration, extension and broadening of the co-management system, stated that taking more responsibility is perceived as possible by the fishing sector but only if implemented under equal circumstances for all (North sea) fishermen (Nijpels 2003).

By the end of March 2004, the Dutch demersal fishing sector and the Dutch Ministry of Agriculture, Nature and Food Quality issued a joint *statement of intent*. In this statement, government and sector express their believe in and appreciation of a sustainable, thriving and socially responsible cutter fishing sector, and express their commitment to the transition process required to achieve this objective. This implies that the government and the sector jointly deploy the available resources (people, means and instruments) to devise a sustainable demersal fisheries with structurally and economically sound perspectives on a multiannual basis. The first structural problem that was tackled in this transition towards responsible fishing was the monitoring and control of engine power of the demersal fleet (Werkgroep motorvermogen 2006).<sup>7</sup>

In the 2005 review of co-management and engine power (Hoefnagel and van Mil 2008) it is stated that neither group managers nor individual fishermen consider the enforcement scheme to really be an issue within the fleet. The fishing sector, the General Inspection Service and the management groups do not foresee any real problem with this scheme, in particular because the high oil prices discourage fishing crews from sailing at full engine power while fishing. A full evaluation will be conducted in 2009.

The Dutch management system has since the introduction of the EU CFP in 1983 resulted in a smaller fleet, with less overall capacity. Catches of plaice and sole are in line with the total Dutch quota allocation and at least for a period of 10 years (1991-2001) the net results of the fleet have been positive. Employment in terms of number of crew is reduced and also investments in the fleet have diminished (van Hoof forthcoming-a).

Analysing the effects of the Dutch system, we should realise that the management instrument has not been introduced in isolation but was part of a series of government management instruments among which the establishment of the ITQ system, the co-management system, intensified control, a days-at-sea regime, a maximum gear width for double-beam trawls and, in addition, next to an overall limitation of fleet capacity under the MAGP, a maximum engine capacity of 2000 HP for new ships was set. In fact some of the instruments applied work in parallel. Court ruling in the Netherlands for example made clear that the right to fish an amount of fish prevails over a limitation of effort in terms of days-at-sea, in case days-at-sea regulation and ITQ entitlement are conflicting. Others, such as compulsory landing of catches at an auction greatly enhanced the monitoring and enforcement capabilities of the system (van Hoof forthcoming-a).

The managerial role in quota trade that the groups have taken might be the reason that there is no clear evidence that quota have left the segment of family owned beam. This is despite worldwide evidence that quota tend to leave the primary fishing sector to be either accumulated by larger fleet owners or even processing industry (Copes and Charles 2004; Mccay 2004; Squires et al. 1995). Indeed the fact that individual quota holdings are being brought into a management group might have been a major reason for this, as in first instance quota transfers are being traded within the confines of the group (van Hoof forthcoming-a).

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<sup>7</sup> In an active gear fisheries, such as the beam trawl fleet, the engine capacity is a direct contributor to fishing success. The engine power (licensed capacity) of the demersal Euro cutter fleet (the beam trawl segment under EU regulations) is subject to a maximum engine capacity of 221 kW (300 hp). Especially the control on engine capacity was an issue of the deliberations of extension of the co-management system for the commission Nijpels.

## Conclusions on the Dutch co-management system

The Dutch co-management system now covers management of ITQs and engine power. In the future it is the intention to expand the system with the collective combat of illegal fishing practices.

However, fishermen still feel a bit uncomfortable with the issue of self control, which is perceived as a kind of treason towards their peers. The inherent idea that group pressure will result in better compliance proves to be partly true (Hoefnagel and De Vos 2004).

The main effects of the Dutch co-management system are a better use of quota and increased compliance with the quota regulations and engine power limits. These were the initial reasons for implementing the system and it appears to be successful. The aim of inducing improved relationships between fishermen and government on the one hand and on the other among fishermen themselves has partly been successful.

The problem of the so called 'level playing field' remains, since Dutch fishermen share their stocks with other European fishers that are not subject to the co-management system. Dutch fishermen complain about the restrictions they sometimes voluntarily impose on themselves, but which their foreign colleagues do not obey.

From the Dutch case we learn that co-management within the CFP is a viable option. Co-management is a specific local participatory arrangement fitting the local institutional setting. However, we also learn from the Dutch case that Dutch fisheries co-management is not so much a participatory interactive policy arrangement that fishers actively involves in devising policies. Dutch co-management is an arrangement in which a part of management and enforcement is devolved to the fishers, shared with the enforcement agent of the government: a situation of co-enforcement (van Hoof forthcoming-a).

A top down command and control approach to fisheries management places large demands on the management (Sissenwine and Symes 2007). In that respect the introduction of the Dutch co-management system clearly played a role in both bringing back legitimacy to the system and increasing compliance with the quota management. Over the years, official landings of both plaice and sole have been below the TAC, hence in that respect the system has shown a clearly improved performance.

Also, especially compared to the period of great turmoil of the 1990s, the costs of the management system have been reduced greatly. In the early days of the system over the period 1989 – 1992 we see a reduction of costs of the inspection service of some 20% and a reduction of registered infringements of 32% (van Hoof forthcoming-a).

In addition social costs due to unrest and an unstable system have been reduced. This has led internationally to the good reputation of the fisheries control in the Dutch ITQ system, which is largely based on self-responsibility among the local producer organisations (management groups), now regarded as a best-practice model by the EU (Hentrich and Salomon 2006).

The Dutch fisheries co-management system is a public-private partnership, using the capacities and interests of user-groups, complemented by the ability of the fisheries administration to provide enabling legislation and administrative assistance. But then again, following Smit (Smit 1997) in his analysis of the Dutch ITQ system, the co-management system, like the ITQ system has to share the credit for this success with other developments such as intensified control accompanied by licensing, input management (maximum days-at-sea), and maximum gear width for double-beam trawls. In fact, in real terms what is labelled a co-management system is in practice a mere ITQ management system. Hence the core of the system not being a joint management of fish stocks but a decentralised effort of monitoring quota uptake and keeping landings in line with set TACs.

Using Raakjær Nielsen and Vedsmand's (1999) classification of co-management, the actual Dutch management of quota at group level is an example of cooperative management, where responsibilities of government are devolved to user-groups. However, the user-groups have no direct input in the wider policy development process rather than a mere instructive role. In fact, looking at the polity and politics aspects of Dutch fisheries management, the Directorate for Fisheries is still in the driving seat.

## 4 Governance

Broadly speaking, governance describes steering or governing systems. In the debate on governance two definitions can be distinguished.

1. **Descriptive.** The first definition stresses the **analytical description** of changes in locus and focus of governance. It describes the shortcomings of the nation state model and the emergence of new practices and arrangements in which policy and politics takes place. This definition is about rethinking the nation state model and the territorial order of policy making and politics.
2. **Prescriptive.** The second definition is about governance as a management model. In this model governance is about managing societal processes and to find solutions for unstructured or wicked problems in constructed policy networks in which public and private actors define problems and negotiate about possible solutions

### 4.1 Descriptive definitions of Governance

*Different descriptive definitions of governance:*

- Self-organizing, inter-organizational networks characterized by interdependence, resources-exchange, rules of the game, and significant autonomy from the state (Rhodes 1997)
- The stewardship of formal and informal political rules of the game, referring to those measures that involve setting the rules for the exercise of power and settling conflicts over such rules (Hyden)
- Governance is about managing rules of the game in order to enhance the legitimacy of the public realm (Kjaer 2004)
- A society-centred way of 'governing', accentuating coordination and self governance manifested in different types of policy arrangements (Van Tatenhove 2003)

Here, we follow Van Tatenhove and define governance as a society-centered way of 'governing' or 'steering', accentuating coordination and self-governance, manifested in different types of policy arrangements, which are an expression of an increasing encroachment of state, civil society and market, with rather vague demarcation lines (Van Tatenhove 2003).

Policy arrangements can be defined as the temporary stabilization of the content and the organization of a particular policy domain. The structure of policy arrangements can be analyzed along four dimensions: coalitions, resources, rules and discourses (Lieverink 2006; Van Tatenhove et al. 2000).

- The actors and their **coalitions** involved in the policy domain;
- The division of **resources** between these actors, leading to differences in power and influence, where power refers to the mobilization and deployment of the available resources, and influence to who determines policy outcomes and how;
- The **rules** of the game currently in operation, in terms of formal procedures of decision making and implementation as well as informal rules and 'routines' of interaction within institutions; and
- The current policy **discourses**, where discourses entail the views and narratives of the actors involved (norms, values, definitions of problems and approaches to solutions).

### *A Changing Context of Policy and Politics*

- Shift in Locus
  - New Actors (empowerment of sub-national actors, NGOs, transnational networks)
  - New Levels (interconnectedness of levels and arenas: supra-national, national, sub-national, transnational)
- Shift in Focus
  - New Rules (new political spaces and arenas where rules are negotiated)
  - New Steering Mechanisms (no clear lines of authority; interplay of formal and informal practices: beyond the state – supranational dichotomy) (Van Tatenhove and Van Leeuwen 2007)

The shift in locus refers to the fact that policy is being devised at a new 'place'. Where traditionally in the Netherlands fisheries policy was negotiated in a neo-corporatist setting between the fisheries sector and government, today for example with the coming about of the covenants for the North Sea and the Mussel sector, the policy is being discussed between the sector, environmental NGOs and government. In fact the table at which fisheries policy is being debated is out at a different stage with new participants.

Also there is a shift in focus, aim, content and ways of achieving goals, in fisheries management. Traditionally fisheries management was devised under the CFP. With the coming about of the Marine Strategy Framework Directive (MSFD), the Maritime Policy (MP) and the Johannesburg World Summit on Sustainable Development (WSSD) both the focus and the locus of fisheries policy is being altered. The MSFD reflects an environmental policy regulating the marine environment, outside the conservation paragraph of the CFP. The Maritime Policy reflects an integrated arrangement in which sectors and activities are brought under one umbrella; the CFP as part of this is hence moving from a fisheries dedicated stage to a stage at which other stakes and stakeholders (for example from oil & gas, shipping, energy, tourism) also have a place. The Johannesburg WSSD MSY target represents a development in which targets for EU Fisheries policy are not determined at the EU level but at the global level.

In general we can witness a shift from a fisheries focused policy (CFP) that integrates fish stock conservation, market development, fleet structure development and relations with third countries within a fisheries discourse, towards an environmental discourse under the MSFD and a maritime integration discourse under the Maritime Policy. These developments result in new rules and fora. For example the RACs are a relatively newly created instrument (introduced under the 2003 reform of the CFP) to increase the participation and input from fishers and other stakeholders in fisheries policy development. The Council Decision initiating RACs in fact defines new rules of who can participate, hence who is in the system and who is not.

Also we see the emergence of new steering mechanisms such as private arrangements between NGOs and the market, for example the Marine Stewardship Council.

Characteristics of the “new governance” setting:

- Different scales: global, regional, national and local
- New modes of interaction between state, civil society and market actors at different levels
- Interdependence between public and private actors in the formation and implementation of policy
- Competencies are shared; diversity of policies
- Emphasizing the dynamic interplay of frontstage and backstage and formal and informal practices

## 4.2 Prescriptive definitions of Governance

In prescriptive definitions of governance the emphasis is on finding solutions for wicked problems. Prescriptive governance is not only a technical instrumental process in which the focus is on the selection of instruments; governance is also a power game in which actors try to realize their objectives and goals by using strategies and mobilizing resources.

In the CFP reform process, 27 systems of governance (the Member States) come together to devise a new policy. The question that arises for the Member States is how to control or influence the coalitions, rules, resources and discourses at the EU level.

An example of a prescriptive definition of governance is the World bank statement on good governance:

*The manner in which power is exercised in the management of a country's economic and social resources for development (1992, 1994)*

with elements: public sector management, accountability, legal framework for development and transparency and information.

Another example of a prescriptive definition of Governance is the EU White Paper on governance (EC 2001; EC 2002):

**“Openness.** *The Institutions should work in a more open manner. Together with the Member States, they should actively communicate about what the EU does and the decisions it takes. They should use language that is accessible and understandable for the general public. This is of particular importance in order to improve the confidence in complex institutions.*

**Participation.** *The quality, relevance and effectiveness of EU policies depend on ensuring wide participation throughout the policy chain – from conception to implementation. Improved participation is likely to create more confidence in the end result and in the Institutions which deliver policies. Participation crucially depends on central governments following an inclusive approach when developing and implementing EU policies.*

**Accountability.** Roles in the legislative and executive processes need to be clearer. Each of the EU Institutions must explain and take responsibility for what it does in Europe. But there is also a need for greater clarity and responsibility from Member States and all those involved in developing and implementing EU policy at whatever level.

**Effectiveness.** Policies must be effective and timely, delivering what is needed on the basis of clear objectives, an evaluation of future impact and, where available, of past experience. Effectiveness also depends on implementing EU policies in a proportionate manner and on taking decisions at the most appropriate level.

**Coherence.** Policies and action must be coherent and easily understood. The need for coherence in the Union is increasing: the range of tasks has grown; enlargement will increase diversity; challenges such as climate and demographic change cross the boundaries of the sectoral policies on which the Union has been built; regional and local authorities are increasingly involved in EU policies. Coherence requires political leadership and a strong responsibility on the part of the Institutions to ensure a consistent approach within a complex system.

Each principle is important by itself. But they cannot be achieved through separate actions. Policies can no longer be effective unless they are prepared, implemented and enforced in a more inclusive way.

The application of these five principles reinforces those of

**Proportionality and subsidiarity.** From the conception of policy to its implementation, the choice of the level at which action is taken (from EU to local) and the selection of the instruments used must be in proportion to the objectives pursued. This means that before launching an initiative, it is essential to check systematically (a) if public action is really necessary, (b) if the European level is the most appropriate one, and (c) if the measures chosen are proportionate to those objectives.”

The debate on which of these criteria are relevant and how to operationalise them has yet to be started.

**Participation** is the involvement of agents, such as citizens, NGOs and other stakeholders, in politics and the process of governance. Indirect participation through voting, referendum or consultation. Direct participation through advising, deliberation or co-production (Van Tatenhove and Leroy 2003).

Legitimacy can be defined as: the acceptance of the political system, law-making, the outcome of policy processes or the quality of decision-making processes. There are three types of legitimacy: **(1) Input legitimacy** emphasizes ‘government by the people’. Political choices are legitimate if they reflect the ‘will of the people’ – that is, if they can be derived from the authentic preferences of the members of a community. **(2) Output legitimacy** emphasizes ‘government for the people’. Political choices are legitimate if they ‘work’, ‘perform’, are able to ‘deliver goods’. The democratic dilemma has gone beyond weighing input (government by the people) and output (government for the people) legitimacy and has come to include considerations of throughput legitimacy. **(3) Throughput legitimacy** refers to the concern for the quality of the structure and procedure of a policy-making process in terms of legality, transparency, fairness, responsiveness, deliberation, openness and efficiency. Throughput legitimacy asks how a decision is taken, who is responsible for them and which issues are at stake (Scharpf 1999; Van Tatenhove 2008).

Accountability is defined as: a relationship between an actor and a forum, in which the actor has an obligation to explain and justify his or her conduct, the forum can pose questions and pass judgment, and the actor may face consequences (Bovens 2007). This addresses four questions:

1. To whom is account to be rendered? (the problem of many eyes)
2. Who should render account? (the problem of many hands)
3. What is account to be rendered?
4. Why does the actor feel compelled to render account to a forum? (forced or voluntarily)



### 4.3 Fisheries Governance

*“Sharing of policy making competences in a system of negotiation between nested governmental institutions at several tiers (international, (supra)national, regional and local) on the one hand, and state actors, market parties and civil society organizations on the other in order to govern fisheries activities and their consequences”(Van Tatenhove 2008)*

In the Netherlands the significance of fisheries is rather small and diminishing. Out of the 23 communities in the Netherlands with a significant cutter fleet the contribution to employment on average is less than 0.5%; only in communities like Den Oever (9%) and Urk (7%) the contribution to employment is more significant (Salz et al. 2008). The communities are, compared to for example Iceland and Norway, not very isolated. Of course the disappearance of fishing vessels and hence related fishery activities does have an impact on local communities. As these communities are closely linked to the wider economy, in recent years we have seen that wage opportunities in other sectors have been such that crew members have already opted to take other jobs. In addition also increasingly the fish processing and trade industry in the Netherlands becomes less dependent on national landings and more involved in international trade flows (van Hoof forthcoming-b).

This relative minor position of fisheries results in a relative minor attention for fisheries policy, especially the role the Netherlands play at the EU stage, compared to more fisheries dependent countries such as Spain. Before 1975, Dutch fishermen had quite some freedom to decide on their operations; the level of regulation was rather modest. This fitted into the national political philosophy based on 'subsidiarity' and 'sovereignty in own circle' (Van Hoof et al. 2005). In an organizational sense this is exemplified by neo-corporatist institutions in fisheries (but also in agriculture and many other sectors) in which government and organized interests (mainly trade unions and employer associations) jointly develop and implement social-economic policies. The government does not operate at a distance and organized interests do not have to lobby; they are welcome partners at the table. There is tripartite consultation at all stages of legislation and policymaking. Often this is institutionalized in advisory bodies, but much coordination takes place in an informal way (van Hoof forthcoming-a).

The current context of fisheries management offers several new arrangements in fisheries governance:

- Regional Advisory Councils (RACs)
- Long Term Management Plans
- Marine Stewardship Council certification

Below, an appraisal of these new arrangement against the principles of good governance:

Good Governance	RACs	Long term Fisheries Management plans	MSC
Openness	+/-	--	+
Participation	Indirect consultation in implementation	--	Direct participation
Accountability	Forum not clear; constituency not inclusive	Horizontal: Forum is EU/MS	Diagonal: horizontal & Vertical
Effectivity	<sup>1</sup> new forms of participation by stakeholders in the CFP through establishment of RACs. <sup>2</sup> To contribute to the achievement of the objectives of the CFP, RACs should be established to enable benefit from the knowledge and experience of fishermen and other stakeholders.	?	Objective is sustainable fisheries through certification
Coherence	- (RACs comment on policies outside their remit)	- as in CFP different and sometimes conflicting aims: conservation, market, structure thids coutries policies	- social sustainability
Proportionality	+	+	+/-
Subsidiarity	+	++	n.a.

The EU white Paper on Good Governance presents a set of criteria to which all policy should adhere. In fact these criteria reflect an evaluatory framework for the assessment of fisheries policy and novel governance arrangements. Here we take a look at three arrangements (Long Term Management Plans, RAC, MSC). Of course, this can be but a preliminary assessment for three reasons:

1. The arrangements have not been fully operational in all aspects of fisheries for a long period, hence for example with Long Term Management Plans and some of the RACs implementation experiences are limited.
2. Evaluating the arrangements along the Good Governance criteria of Openness, Transparency, Accountability, Effectivity, Proportionality and Subsidiarity is not an exercise that can be implemented within the short time span of a workshop.
3. Assessing an arrangement with the five governance criteria requires the perspective of all stakeholders involved. It is not unrealistic to assume that for example in the RACs the Commission, Fishers and E-NGOs have a differing perception of the position, role and impact of the RACs

On openness: with respect to RACs and MSC, information is available and accessible for example through websites. For Long Term Management Plans information is both not easily obtainable and not easily understandable due to its high idiosyncratic character.

On participation: in Long Term Management Plans participation is very low. In RACs the participation is limited to a selected group of fisheries sector representatives and other limited stakeholder groups. In addition participation is limited to a process of indirect consultations in implementation. In MSC participation is direct through stakeholder consultation.

On accountability: with respect to RACs it is unclear to which forum they can be held accountable. The RAC's constituency is not included in the RAC remit. With respect to Long Term Management Plans, they are set in a

horizontal EU-Member State setting of accountability. MSC has diagonal accountability: a vertical accountability towards international accreditation standards and a strand of horizontal accountability through participation and consultation in assessments.

Recently initiatives have been taken by the Pelagic RAC (horse mackerel) and the North Sea RAC (nephrops) in the development of Long Term Management plans. These examples show that RACs can take the initiative to develop a more open and participatory governance solution despite an originally top down arrangement of devising a Long Term Management Plan.

The assessment of effectiveness is related to the extent to which the action has obtained its results. In the table above we present the objectives of the three arrangements. It is beyond the scope here to appraise effectiveness in implementation since long term management plans are under way and for RACs and MSC this should be assessed by the stakeholders.

On coherence: the EC commented that RACs sometimes provide advice on policies outside their remit (e.g. third country arrangements) which is not coherent. Long Term management plans sometimes trigger a conflict of aims, for example between the conservation aims and the economic aims. The MSC does not take social sustainability into account and hence is not coherent with other policy objectives.

On proportionality: in general the measures proposed are at par with the desired outcome.

On subsidiarity: doing things at the right level, RACs in principal are well situated as they advise on what could be perceived as the ecosystem level. Fisheries management plans are set at the Commission level which matches the characteristics of the stock one seeks to manage. MSC as not being a public arrangement does not resort under subsidiarity considerations.

## 4.4 Conclusions on fisheries governance arrangement

Examples of three fisheries governance arrangements:

- A top down instrument (Long term management plans)
- A participatory arrangement (RACs)
- A market based arrangement (Marine Stewardship Council)

Towards the future:

- Fisheries management being shaped at different stages (cf MSFD, Natura 2000, WSSD MSY-target). Maritime policy will challenge fisheries arrangements because the rules and discourses of other marine policy domains will affect the content and organisation of the CFP (van Hoof and van Tatenhove 2009)

- This leads to discourse shifts:
  - from fisheries towards ecosystem objectives
  - from “fisheries sector based” towards “maritime sector based policy”
  
- This means that fisheries governance will have to address:
  - participation, accountability and legitimacy
  - with more stakes and stakeholders
  - across sectors, levels and activities
  - across member states and regions
  - at an integrated (eco)system level

## 5 Integration with other policies

This section describes the interaction between National and EU marine/maritime policies that have implications for fisheries management. The rationale behind the section is to examine marine policies on their spatial claims in relation to fisheries (Figure 5.1). For practical reasons the study was limited to the North Sea. The main assumption is that Dutch fisheries in the North Sea will increasingly have to deal with other users and uses of the North Sea.

### Research questions

- Which marine policies are effective or proposed, both at the European scale and at the Dutch scale. (Inventory of objectives, instruments, time frames, scope, responsibilities)?
- How are stakeholders involved in the development of policies and in the implementation of policies?
- Which spatial claims in e.g. the North Sea are embedded in the different marine policies?
- How are different marine policies expected to affect future fisheries policy?

We first discuss the Dutch draft National Water Plan (V&W 2008a) which can be seen as the implementation of national, EU and other international policies by a member state. In the following section, each of these policies are elaborated individually, and in the final part conclusions are drawn from the analyses of these policies.

### 5.1 Draft National Water Plan (2008)

The *Ontwerp Beleidsnota Noordzee* (V&W 2008b) is a draft policy bill that is part of the National Water Plan. The bill elaborates and justifies policy choices and the implementation as described in the National Water Plan.

#### *Objective*

The first National Water Plan is a framework vision based on the new Water Act (Waterwet) and the Spatial Planning Act (Wet Ruimtelijk Ordening) and drafted for the 2009-2015 planning period. The aim is to create a safe and liveable delta for the Netherlands, now and in the future. The plan is a response to developments in climate, demography and economy, and it invests in sustainable water management. The goals of the National Water Plan are in line with the objectives as set out in the Water Framework Directive, the Marine Strategy Framework Directive, the OSPAR convention and the Birds and Habitat Directives. In consultation with the Dutch fishing sector, nature protection organizations and other EU member states, and within the framework of the European Common Fisheries Policy, the focus is on working towards the sustainability of fishing in the North Sea.

Three main societal development tasks can be deduced from the current developments in and around the North Sea.

- In general: sustainable (economic) development in equilibrium with the marine system.
- Extra emphasis: reserving sand extraction locations for coastal defence and protection against flooding.
- Extra emphasis: space for large scale sustainable energy production.

Within international frameworks, the Dutch government is giving priority to the following activities that are of national importance for the Netherlands:

- Sand extraction and replenishment: sufficient space for protecting the coast, counteracting flood risk and for sand suppletion on land;
- Sustainable (wind) energy: space for 6,000 Megawatt of wind energy on the North Sea in 2020 (at least 1,000 km<sup>2</sup> , creating conditions for further (international) growth after 2020);
- Oil and gas field development: extracting as much natural gas and oil from the Dutch fields in the North Sea as possible;
- Sea shipping: building a system of traffic separation schemes, clearways and anchoring areas allowing safe and prompt handling of shipping;
- Defense areas at sea.

*Status:* Draft Plan

*Time frame:* The Draft National Water Plan was published in December of 2008. The National Water Plan is set to be adopted in 2010.

*Responsibility:* The Minister of Transport, Public Works and Water Management is responsible for the coordination of the integrated Dutch North Sea policy development and management. This is done in collaboration with other ministries through the Interdepartmental Directors' Consultative Committee North Sea (IDON). This platform is responsible for the further development of the integrated North Sea policy. The Directorate General for Public Works and Water Management (*Rijkswaterstaat*) coordinates the management of the North Sea. The Dutch North Sea policy is elaborated in the Integrated Management Plan for the North Sea 2015 (IMPNS2015) (IDON 2005). As soon as the National Water Plan is adopted in 2010 the IMPNS2015 will be revised.

*Relevance for fisheries management:* In the period 2005 – 2015 the total economic value of the fisheries in the Dutch EEZ is expected to decrease by 8 – 50 %. In the context of the Dutch North Sea policy 2009 -2015 several fisheries actions are described. Figure 5.1 illustrates the competition of different spatial claims in the North Sea.

*Stakeholder involvement:* Public consultation is scheduled for May and June of 2009. When the plan is in place existing and new users will be informed of the space available for new activities and the conditions attached.

**Table 5.1: Dutch policy activities in the North Sea 2009-2015**

<b>Wat (What)</b>	<b>Wie (who)</b>	<b>Wanneer (when)</b>
Actualisatie Beheerplan Noordzee 2015	VenW, LNV, EZ, VROM	2010
Aanwijzen Doggersbank, Klaverbank, het Friese Front, Westerscheldemonding / Vlakte van de Raan en delen van de Kustzee ten noorden van Bergen als Natura 2000 gebied en MPA OSPAR gebied	LNV	2010
Natuurbeschermingswet 1998, Flora- en Faunawet, in Nederlandse EEZ van toepassing verklaren.	LNV	2010
Vaststellen strategie en locaties winning suppletiezand	VenW	2010
Besluit over aanwijzen windenergiegebieden binnen de zoekgebieden voor Hollandse kust en boven de Waddeneilanden	VenW, EZ, VROM, LNV, Defensie	2010
Aanpassing beleidsregels waterwetvergunning tbv aanwijzing windenergiegebieden	VenW, EZ, LNV, VROM	2010
Implementatietraject windenergie op de Noordzee	EZ, VenW, VROM, LNV, met inbreng van maatschappelijke partijen	2010
Onderzoek samengaan duurzame visserij-technieken en windenergiegebieden	LNV, VenW, EZ, VROM	2010
Aanpassing Maasgeul, Eurogeul, IJgeul en Eemsgemaal; Beluivorming eventueel ankergebied tbv Eemshaven	VenW	2010
Onderzoek samengaan duurzame visserij-technieken en 'energiegebieden'	LNV	2010
Verkenning borging van afweging ruimtelijke claims, o.a. optie Rijksinpassingsplan	VenW, VROM, LNV, EZ	2011
Onderzoek bescherming van ecologisch waardevolle gebieden in kader van Natura 2000 en KRM	LNV, VenW	2012
Besluitvorming over meer beschermde gebieden op zee Natura 2000 en KRM	LNV, VenW, EZ, VROM	2012
Inzet op duurzame visserij in Europees verband van EVF en GVB	LNV	2013
Beheerplan Natura 2000-gebieden op zee	VenW, LNV	2013
Maatregelenpakket KRM	VenW, LNV, EZ, VROM	2015
Besluit over eiland voor energieopslag en winning	EZ, VenW, LNV, VROM, maatschappelijke partijen	2015 (voor)
Twee pilots voor CO2-opslag	EZ, VenW, LNV, VROM	2015 (uiterlijk)

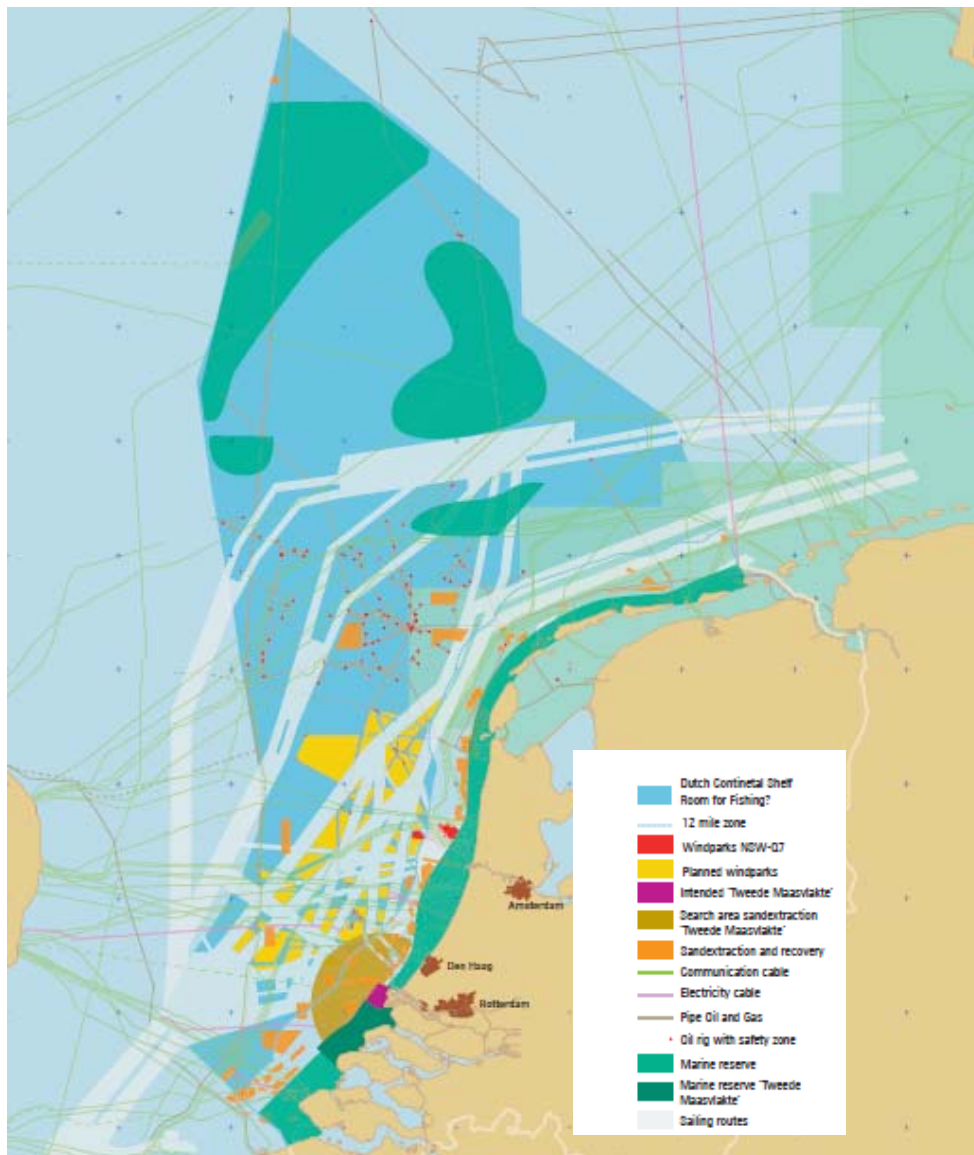


Figure 5.1: Spatial claims in the Dutch part of the North Sea (PV 2004)



## 5.2 International marine and maritime policies

In the following review we briefly describe the objectives, status, timeframe and relevance for fisheries management of a number of relevant marine/maritime policy documents:

- "Birds Directive" (79/409/EEC)
- "Habitat Directive" (92/43/EEC) and the Natura 2000 network
- Water Framework Directive (2000)
- OSPAR Convention on Protecting and conserving the North-East Atlantic and its Resources
- World Summit on Sustainable Development (WSSD, 2002)
- Maritime Policy ("Blue book", 2007), with the associated communications, e.g.:
  - Action Plan Maritime Policy (2007)
  - European Strategy for Marine and Maritime Research
  - Roadmap towards maritime spatial planning by Member States
  - A Strategy to mitigate the effects of Climate Change on coastal regions
  - Reduction of CO2 emissions and pollution by shipping
  - Review of EU labour law exemptions for the shipping and fishing sectors

### 5.2.1 "Birds Directive" (79/409/EEC)

*Objective:* The birds directive aims at protecting all European wild birds and their habitats. In the annex, all the vulnerable bird species are listed that "shall be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution" (Article 4 1).

Conservation and habitat protection shall be achieved through site protection. Article 4 1 d states that "Member States shall classify in particular the most suitable territories in number and size as **special protection areas** (SPAs) for the conservation of these species, taking into account their protection requirements in the geographical sea and land area where this Directive applies".

A definition of SPAs is not given. They are understood as areas of importance for migratory bird species, especially wetland habitats. Indicators or procedures how to select SPAs are not specified, either.

*Status:* An EU Directive, which is legally binding, but has to be implemented under national law.

*Responsibilities:* Treaties regarding natural ecosystems and its species and habitats within European territory are often transboundary in nature; hence measures for conservation are taken at Community level. The accompanying research on deterioration should also be performed through transboundary cooperation.

Member states are responsible for national implementation of the Directive.

*Time frame:* The birds directive is the EU's oldest piece of nature legislation. Every three years, Member states are obliged to send a report on the implementation of national provisions taken (Article 12). The time frame today is set by the Natura 2000 time schedule (see below).

*Relevance for fisheries management:* The birds directive bans activities that directly threaten birds, e.g. hunting; disturbance during the period of breeding and rearing. The designation of SPAs is relevant for fisheries management, as fishing in SPAs might be curtailed or even prohibited.

## 5.2.2 "Habitat Directive" (92/43/EEC) and the Natura 2000 network

*Objectives:* The aim of the Habitat Directive is "to contribute towards ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States". Measures shall be designed to maintain or restore these habitats and species at "favourable conservation status" and they shall "take account of economic, social and cultural requirements and regional and local characteristics" (Article 2). Structures and functions that are necessary for long-term maintenance in the future should be ensured.

The directive requires the setting up of **a coherent European ecological network of special areas of conservation (SAC) under the title Natura 2000** (Article 3).

A *special area of conservation* is defined as "a site [...] where the necessary conservation measures are applied for the maintenance or restoration, at a favourable conservation status, of the natural habitats and/or the populations of the species for which the site is designated" (Article 1 I). The Natura 2000 network shall also include the **special protection areas** designated under the Birds Directive (Article 3.1).

*Status:* EU Directive

*Responsibilities:* The EU Biodiversity Action Plan outlines the respective responsibilities of EU institutions and MS. Each Member State shall propose a list of selected areas with its accompanying species and habitats. Experience of other Member States should be used in the re-introduction of species that are native to their territory, in order to determine if such a re-introduction contributes to a favourable conservation status. These measures should also be implemented **after consultation of the public concerned. Education and information should be provided** to re-establish species and to conserve the environment.

*Time frame:* A general time frame for procedures to be taken by MS is set out in article 4. Once a site of Community importance has been adopted, the MS concerned shall designate that site as a special area of conservation **as soon as possible and within six years at most**.

Additionally, more detailed and specific time schedules can be found in different EU and national documents (EC 2007b; EC 2008d). A summary of time frames is presented in the following paragraphs.

The world summit on sustainable development (WSSD) sets out the overarching deadline: Natura 2000 areas and the coherent network need to be finalized and implemented by **2012**.

The EU Biodiversity Strategy and EU Biodiversity Action Plans (BAP) set clear prioritized objectives and actions to achieve the target of halting the loss of biodiversity by 2010 and to accelerate efforts to finalise the Natura 2000 network.

- adopt lists of Sites of Community Importance (SCI) **by 2008** for marine;
- designate Special Areas of Conservation (SAC) and establish management priorities and necessary conservation measures for SACs **[by 2012** for marine];
- establish similar management and conservation measures for SPAs **[by 2012** for marine]".

The Action Plan also specifies indicators to **monitor progress**, and a **timetable for evaluations**.

*Relevance for fisheries management:* Natura 2000 marine areas will not necessarily be "no take zones", but zones where sustainable use of resources in an environmentally friendly way is needed. For this reason they may require specific fishery management measures for the purpose of conservation of those species and habitats for which the site has been designated. Fisheries management measures in those areas should be decided **in the**

**context of the Common Fisheries Policy** taking into account the principles of proportionality and non discrimination.

**Depending on the conservation objectives of the marine SPAs and SCI** (the "Natura 2000 sites"), Member States may envisage the implementation of certain fisheries management and control measures. When drafting their proposal for measures, Member States are encouraged to **ensure a good coordination between fishery and environmental authorities at Member State level and with stakeholders.**

Different procedures apply depending on whether the Natura 2000 site is located within or outside of the 12 nautical miles zone of the Member States' coast (EC 2008d).

*Stakeholder involvement:* Although there is no legal obligation, it is recommended that MS consult Regional Advisory Councils (RACs) concerning marine protected areas at an early stage, as well as the relevant authorities that are competent for fisheries control at and near the sites. Member States are recommended to provide the relevant RACs with comprehensive information on proposed sites and fisheries management measures.

Consultations cover mainly the scientific basis of the request, the extent of proposed areas, the need to ban certain gear, assessment of potential impacts of the closures on fleet and fisheries, enforceability of measures proposed and potential effects of displacement of fishing effort. In line with minimum standards for consultation, the Commission shall ensure that the consultation is carried out within a reasonable timeframe..

### 5.2.3 Water Framework Directive (2000)

*Objectives:* The goal of this directive is to establish a framework for conservation of inland surface waters, transitional waters, coastal waters and groundwater. The objective of **good water status** should be achieved by Member States by 2015 and where this good status already exists, it should be maintained. A common definition for the water status in terms of quality is developed throughout the Community.

*Status:* EU Directive

*Timeframe:* Published in 2000. Achieve good water status in 2015.

*Relevance for fisheries management:* Member States should establish a register of all areas in each river basin that needs special measures for the protection of water, habitat or species. This register should be completed 4 years after the implementation of this directive and should be kept up to date. The transitional and coastal waters within this area are mostly relevant for the marine environment and thus relevant for fisheries management.

The areas that are included in this register are areas that are used for human consumption, areas that protect economically important aquatic species, recreational waters, nutrient sensitive waters and designated areas that require protection, including relevant Natura 2000 sites. This register should include location maps and description of the protected area and the accompanying national or local legislation.

*Who is responsible?* Common principles for Member States on conservation are vital in order to improve the protection of Community waters, its sustainable water use and the contribution to control transboundary water problems (EC 2000). The water use in a river basin may have transboundary effects, and accompanying problems should be coordinated throughout the entire river basin. In case a river basin extends beyond the borders of the Community, Member States should ensure appropriate cooperation with relevant non member states.

Appropriate Community strategies should provide solutions for overcoming obstacles in conserving the water status, when these fall outside the scope of Community water legislation.

*Stakeholder involvement* The successful implementation of this directive relies for a significant part on proper information on planned measures, consultation and involvement of the general public before final decisions are made.

In order to achieve the above, Member States shall be encouraged to make the following information of each river basin available for the public; a timetable and work programme for specific plans, at least three years before the implementation, a temporary overview of significant water management issues identified at least two years before the implementation and draft copies of the plan at least one year before implementation (EC 2000). Background information should be provided on request for the development of the draft river basin management plan.

#### 5.2.4 OSPAR Convention on protecting and conserving the North-East Atlantic and its Resources

*Objective:* The OSPAR convention focuses on the implementation of the ecosystem-based approach and on achieving sustainable management of the marine environment. The main principle of the OSPAR Convention is applying the ecosystem based approach in order to eliminate marine pollution and to achieve sustainable management of the marine areas. Furthermore the precautionary principle, the Polluter pays principle, Best Available Techniques (BAT) and Best Environmental Practices (BEP) are guiding principles for their work.

OSPAR agreed to implement a system of Ecological Quality Objectives (EcoQOs) in the North Sea<sup>8</sup>. These are a set of environmental indicators for a healthy sea as part of the ecosystem-based approach, in order to sustain the marine environment for current and future generations. The Ecological Quality issues that OSPAR takes into account are; Commercial fish species, marine mammals, seabirds, fish communities, benthic communities, plankton communities, threatened and/or declining species<sup>9</sup> and eutrophication.

An important tool to protect and preserve the marine environment are MPAs which are understood to be areas for which protective, conservation, restorative or precautionary measures have been instituted for the purpose of protecting and conserving species, habitats, ecosystems or ecological processes of the marine environment<sup>10</sup>. In 2003 there was agreement on the establishment of an ecologically coherent network of well-managed MPAs within the North-East Atlantic by 2010. These MPAs should have a focus on restoration and protection of ecological processes damaged by human activity and on areas that represent a range of important species, habitats and ecological processes. OSPAR also considered MPAs outside the jurisdiction of the participating countries.

It is the responsibility of the Contracting Parties to select MPAs effectively as part of the OSPAR network.

*Status:* The OSPAR Convention entered into force on 25 March 1998. It replaces the Oslo and Paris Conventions but Decisions, Recommendations and all other agreements adopted under those Conventions will continue to be applicable, unaltered in their legal nature, unless they are terminated by new measures adopted under the 1992 OSPAR Convention. The cooperation of the Contracting Parties covers all human activities that might adversely affect the marine environment of the North-East Atlantic. Nevertheless, programmes and measures cannot be adopted under the Convention on questions relating to fisheries management<sup>11</sup> and there is a preference for issues related to shipping to be dealt with by the International Maritime Organisation.

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<sup>8</sup> [http://www.ospar.org/content/content.asp?menu=00690302200000\\_000000\\_000000](http://www.ospar.org/content/content.asp?menu=00690302200000_000000_000000) (accessed: May 2009)

<sup>9</sup> [http://www.ospar.org/content/content.asp?menu=00730302240000\\_000000\\_000000](http://www.ospar.org/content/content.asp?menu=00730302240000_000000_000000) (accessed: May 2009)

<sup>10</sup> [http://www.ospar.org/content/content.asp?menu=00700302210000\\_000000\\_000000](http://www.ospar.org/content/content.asp?menu=00700302210000_000000_000000) (accessed: May 2009)

<sup>11</sup> [http://www.ospar.org/content/content.asp?menu=00710302220000\\_000000\\_000000](http://www.ospar.org/content/content.asp?menu=00710302220000_000000_000000) (accessed: May 2009)

*Time frame:* OSPAR has first developed, and has been implementing, a suite of five thematic strategies to address the main threats that it has identified within its competence (the Biodiversity and Ecosystem Strategy, the Eutrophication Strategy, the Hazardous Substances Strategy, the Offshore Industry Strategy and the Radioactive Substances Strategy), together with a Strategy for the Joint Assessment and Monitoring Programme, which assesses the status of the marine environment and follows up implementation of the strategies and the resulting benefits to the marine environment. These six strategies fit together to underpin the ecosystem approach. Although this is not a separate Strategy, the OSPAR Commission has also considered the relevance of climate change issues in a wider context.

For some topics, there are specific deadlines, e.g the OSPAR network of MPAs should be established in 2010.

*Relevance for fisheries management:* The OSPAR Convention states that questions relating to the management of fisheries should be regulated under international and regional agreements dealing specifically with such questions.

OSPAR's work on assessing the quality status of the marine environment addresses the impacts of all human activities on the marine environment including fishing. Where OSPAR considers that action for the protection and conservation of the North East Atlantic is desirable in relation to a question relating to the management of fisheries, it acts to draw that question to the attention of the authority or international body competent for that question. Where action within the competence of the OSPAR Commission is desirable to complement or support action by those authorities or bodies, the OSPAR shall endeavour to cooperate with them.

EcoQO Safe fish stocks. Commercial fish species are important components in marine ecosystems. Several species have large populations in the North Sea (e.g. herring and mackerel) and they should have major roles in the structuring and functioning of the North Sea ecosystem. North Sea fisheries have a major impact on the North Sea ecosystem, both directly on the targeted fish stocks and indirectly through affecting the food web. The objective is to achieve safe levels of 26 defined commercial fish stocks. OSPAR will report the number of fish stocks out of those 26, for which this objective is met. For those stocks that fail to meet the objective, OSPAR will urge the competent fisheries management authorities to take appropriate measures. The objectives, which relate to the spawning stocks and the harvesting rates of commercial fish species, are currently subject to revision.

In addition, an EcoQO is being developed for the restoration of large fish. The average length and weight of the fish community can be used as an indicator for the impact of fisheries on the fish community since larger species of fish and larger and older individuals are generally caught more frequently by fisheries than smaller individuals. As a result of fishing, the relative abundance of small and early maturing fish species increases. This can be presented by the average weight and average length of fish in the catch per year using selected fish species. Average weight and length have shown a decline over the last decades. The objective would be to halt decline in mean weight and proportion of large fish.

#### 5.2.5 World Summit on Sustainable Development (WSSD, 2002)

*Objective:* This Summit encourages the application of the ecosystem-based approach, as described in the Reykjavik declaration in 2001, by 2010. Furthermore it promotes the implementation of chapter 17 of the Earth Summit and of Agenda 21, in order to achieve sustainable development of oceans, coastal areas, and seas by means of integrated management and sustainable development of coastal areas (United Nations, 2002).

An additional deadline comprises the establishment of a representative network of time/area closures by 2012 to protect nursery grounds and periods.

The ultimate goal is to achieve and maintain stocks at levels that can produce MSY by 2015, which will signify sustainable fisheries (United Nations, 2002). The 1995 FAO Code of Conduct should furthermore be implemented since it takes special notion of developing countries.

*Status:* Global voluntary agreement

*Timeframe:* Published in 2002. Implementation of ecosystem-based approach in 2010. Representative network of MPAs in 2012. Achieve and maintain stocks at levels that can produce MSY in 2015

*Relevance for fisheries management:* Representative network of MPAs should be established by 2012 in order to protect nursery grounds and certain spawning periods. Stocks at levels that can produce MSY in 2015.

## 5.2.6 Marine Strategy Framework Directive (MSFD)

*Objective:* Member States should achieve a **good environmental status (GES)** by 2020. A good environmental status indicates ecologically diverse and dynamic oceans and seas which are clean, healthy and productive within their intrinsic conditions.

Minimizing human effects and its negative impact on fisheries resources by integrating the environmental dimension into policy making, is a main focus of the MSFD. The development of a transparent and coherent legislative framework will be an important factor in achieving the above.

A network of MPAs should be established by 2012.

*Status:* EU Directive

*Timeframe:* Published in 2008. GES should be achieved in 2020.

*Relevance for fisheries management:* In order to conserve natural habitats and wild fauna and flora, the establishment of marine protected areas (MPAs) is an objective of the MSFD to achieve a good environmental status (EC 2008e). The Habitat Directive has an important role in this achievement together with international agreements on national and international scale within the European Community or Member States. The creation of these protected areas will also be a step in the fulfilment of the commitments made at the World summit on Sustainable Development in Johannesburg.

The formation of a global network of MPAs by 2012 is an attempt to halt biodiversity loss and ensure sustainable use of marine biodiversity and achieve the remaining objective of the Convention on Biological Diversity (EC 2008e). These MPAs should cover all elements of the ecosystem, also for instance the special protection areas for conservation designated by the Habitat Directive. Member States were obliged to allocate Natura 2000 sites under the Birds and Habitat Directives, which will be an important contribution to the process of halting biodiversity loss.

The commission will report on the progress regarding the establishment of the MPAs in 2014, based on the information provided by Member States by 2013. This report will be submitted to the European Parliament and Council (EC 2008e).

*Who is responsible?* According to the MSFD, a transparent and coherent legislative framework is needed in order to contribute to coherence of different policy frameworks (EC 2008e). This framework should coordinate all actions taken properly and make sure they are in line with other Community legislations and international agreements. Member States should make suitable recommendation for Community action if they consider it necessary.

By 15 July 2010, Member States shall allocate authority to each marine region for the implementation of this Directive. By 15 January 2011 Member States shall provide the Commission with a list with allocated authorities, including a list with relevant international bodies in which they participate (EC 2008e).

Each Member State is responsible for identifying certain issues that impact the environmental status of its marine waters. In the case that these issues can not be solved on national level, Member States should inform the Commission on these impacts. The commission shall respond within a period of six months (EC 2008e). If Community action is required, Member States should make suitable recommendations regarding measures that are necessary to tackle the problem. The European Parliament and the Council will be informed by the Commission on these issues and will reflect the recommendations, before the commission shall react with a response to Member States.

*Stakeholder involvement:* When determining the environmental status of marine regions, involvement of all interested parties is required. To ensure active involvement of all stakeholders in the implementation of marine strategies, measures for adequate public information on the strategies or relevant information on the development of the marine strategies are required (EC 2008e). The Directive also states that special notice needs to be given towards communication, stakeholder involvement and raising public awareness

### 5.2.7 Maritime Policy (“Blue book”) - 2007

*Objective:* A comprehensive strategy for marine research, maritime surveillance, spatial planning and IUU fishing are important for the marine policies mentioned above. Stakeholder involvement, ecosystem-based approach, subsidiarity and competitiveness are vital principles to successfully implement the EU integrated Maritime Policy (EC 2007c).

The policy should capture the following topics :

- A European Maritime Transport Space without barriers
- A European Strategy for Marine Research
- National integrated maritime policies to be developed by Member States
- An European network for maritime surveillance
- A Roadmap towards maritime spatial planning by Member States
- A Strategy to mitigate the effects of Climate Change on coastal regions
- Reduction of CO2 emissions and pollution by shipping
- Elimination of pirate fishing and destructive high seas bottom trawling
- An European network of maritime clusters
- A review of EU labour law exemptions for the shipping and fishing sectors

*Status:* Commission communication.

*Time frame:* Published in 2007. End time not formally agreed.

*Relevance for fisheries management:* High because it provides the overall framework for policy in the Maritime area. Fisheries represent a relatively small sector (employment, economics) but with a substantial impact on the marine ecosystem.

### 5.2.8 Action Plan Maritime Policy (2007)<sup>12</sup>

*Objective:* Plan on how the maritime policy will be rolled out over European policy.

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<sup>12</sup> [http://ec.europa.eu/maritimeaffairs/pdf/ActionPaper/action\\_plan\\_en.pdf](http://ec.europa.eu/maritimeaffairs/pdf/ActionPaper/action_plan_en.pdf)

*Status:* input to discussion with European Council, Council of Ministers, European Parliament and others. Unclear when this discussion is going to be finalized and what the product will be.

*Time frame:* published in 2007/2008. End time not formally agreed.

*Relevance for fisheries management:* Depends on the detailed plans to be developed. It is likely that fisheries will become a smaller “player” in the overall maritime policy framework. Specific references to fisheries:

- A Report of the Commission on the practical implementation of the provisions of the Directive 93/103/EC concerning the minimum safety and health requirements for work on board fishing vessels is due for adoption in 2008.
- Implementation of ecosystem approach in the common fisheries policy. In 2008, the Commission adopted a Communication on the overall application of the ecosystem approach to the Common Fisheries Policy.
- Implementation of a policy to progressively eliminate discards in European fisheries: In 2008, the Commission presented a roadmap for the preparation of relevant legislation and indicated first concrete examples of the new policy.
- Protection of fisheries resources in international waters: Eliminate IUU fishing, no destructive fishing practices

#### 5.2.9 Communication on offshore windenergy (EC 2008f)

*Objective:* The potential exploitable by 2020 is likely to be some 30-40 times the current installed capacity, and by 2030 it could be up to 150 GW

*Status:* Commission communication

*Time frame:* Published in 2007/2008. End time not formally agreed.

*Relevance for fisheries management:* No specific references to fisheries management although the space claims by windfarms could have impacts on fisheries. Link to fisheries only through redeployment of fisheries resources to future windfarms: “Many regions in Europe are already realising the potential for future jobs, growth and economic regeneration that lies in redeploying existing skills and resources from fisheries, shipbuilding and harbours in decline”.

The communication explicitly links to the conservation legislation and biodiversity objectives: “finalise the specific guidance on the application of the EU nature conservation legislation in the context of wind farms and take all necessary measures to ensure that Member States designate marine protected areas under the Birds and Habitats Directives in a timely way, so as to improve planning certainty for project developers and contribute to the EU's biodiversity objectives”

#### 5.2.10 Communication on European Strategy for Marine and Maritime Research (EC 2008g)

*Objective:* “propose the means to create a better integration between marine and maritime research. Whilst acknowledging the importance to pursue efforts within the different marine and maritime research disciplines (e.g. cleaner and more efficient marine engines, better vessel design, optimal logistics of traffic flows, safety and security of maritime activities, image of shipping, etc), the focus of the communication will be on improving interactions between marine and maritime research rather than specifically addressing well established research sectors.”



*Status:* Commission communication.

*Time frame:* Published in 2007/2008. End time not formally agreed.

*Relevance for fisheries management:* No specific reference to fisheries research. Research is placed within context of ecosystem approach and integrated with different types of activities. Recommendations on main research themes:

- Climate change and the oceans
- Impact of human activities on coastal and marine ecosystems and their management
- Ecosystem approach to resource management and spatial planning
- Marine biodiversity and biotechnology
- Continental margins and deep sea
- Operational oceanography and marine technology
- Exploitation of marine renewable energy resources

#### 5.2.11 Communication on sea faring jobs (EC 2007d)

*Objective:* “reviews the pertinent legislation in order to identify exclusions or derogations affecting workers in maritime professions and difficulties of interpretation of this legislation. It seeks to determine, against the background of the already extensive body of international conventions and standards, to what extent action may be needed to improve legal protection for maritime professions in the EU.”

*Status:* Commission communication.

*Time frame:* Published in 2007. End time not formally agreed.

*Relevance for fisheries management*

- Proposal for a Directive on enforcement of labour standards (2009-2010)
- Proposal for Council decision for ratification by EU MS of ILO convention on work in the fishing sector.
- Explore implementation of ILO convention on fisheries standards.

#### 5.2.12 Communication on a Roadmap for Marine Spatial Planning (EC 2008c)

*Objective:* To “facilitate the development of Marine Spatial Planning (MSP) by Member States and encourage its implementation at national and EU level. The communication sets out key principles for MSP and seeks, by way of debate, to encourage the development of a common approach among Member States.

*Status:* Commission communication.

*Time frame:* Published in 2008. End time not formally agreed.

*Relevance for fisheries management:* “Increased activity on Europe's seas leads to competition between sectoral interests, such as shipping and maritime transport, offshore energy, ports development, fisheries and aquaculture and environmental concerns.” However, there is no specific reference to links from spatial planning (“zoning”) to fisheries management.

“The CFP is exclusive EU competence. A good example of integrated management of marine space across sectoral policies is the decision (...) adopted by the Commission at the request of the Dutch government to protect a habitat on the Dutch North Sea Coast (Voordelta area). Given the interaction of fisheries with the ecosystem and the mobility of fish stocks, sustainable management of fisheries in EU waters would benefit from coherent MSP.”

### 5.2.13 Communication on Ecosystem approach and Common Fisheries Policy (EC 2008b)

#### *Objectives:*

- (1) keep direct and indirect impacts of fisheries on marine ecosystems within bounds in relation to healthy marine ecosystems and ecologically viable fish populations by including all the knowledge we have about the interactions between fisheries and marine ecosystems in decisions under the CFP, and
- (2) ensure that actions taken in fisheries are consistent with and supportive of actions taken under the cross-sectoral Marine Strategy and Habitats Directive.

*Status:* Commission communication.

*Time frame:* Published in 2008. End time not formally agreed.

*Relevance for fisheries management:* Highly relevant. The CFP will support policies aimed at an ecosystem approach to marine management:

- In the short and medium term, steps to reduce overall fishing pressure on marine ecosystems will continue, including implementation of the MSY approach through longterm management plans and in annual or multiannual proposals on catch limitations.
- Legislation will be developed to reduce unwanted by-catches through the discard policy and technical measures will be revised to include considerations of habitat damage and by-catch.
- For specific groups of sensitive species plans of action are being developed where a toolbox of instruments is used to provide specific protection. A plan of action to protect sharks and elasmobranchs will be published in 2008 and a plan of action to protect seabirds will be published in 2009.
- Simplified technical measures through the new regulation proposed in 2008 will trigger improvements in the selectivity of fishing gear.

## 5.3 Conclusions on integration with other marine and maritime policies

### ***1. Definitions and Planning of MPAs is rapidly progressing***

According to the MSFD, the formation of a coherent network of MPAs by 2012 should be achieved. This initiative was already proposed by the WSSD in Johannesburg. These MPAs are vital in halting biodiversity loss, ensuring sustainable use of the marine biodiversity and protecting nursery grounds and certain spawning periods. The special areas for conservation that are allocated by Member States for Natura 2000 should also be taken into account in the establishment of these MPAs under the MSFD. The commission will report on the progress regarding the establishment of the MPAs in 2014.

The WSSD aims to implement representative networks of MPAs, which should be established by 2012, in order to protect nursery grounds and certain spawning periods.

The Maritime Policy refers to maritime spatial planning, where Member States are responsible for each designated area, although these responsibilities should be guided by principles made at Community level.

The Water Framework Directive requires that Member States specify the areas within the river basin that are in need of special protection, again also taking into account the Natura 2000 sites. In designating these areas for special protection, indicators such as areas for human consumption, areas that protect economically important aquatic species, recreational waters and nutrient sensitive waters should be taken into account. Member States have responsibility for compliance to these measures for at latest 15 years after the implementation of the Water Framework Directive (2000), unless stated otherwise in the Community legislation.

Natura 2000 sites, which are part of the Birds and Habitat Directives, aim to establish a coherent European ecological network of special areas for conservation, based on specific habitat types and species. These networks should assure the restoration and conservation of these habitats and species. Member states should propose a list with selected areas and subsequently these special areas for conservation moreover need to be assessed on Community interest before becoming official special areas for conservation. This coherent network of MPAs should be established in 2012.

The OSPAR convention also considers a network of MPAs for creating protective zones in the marine area. These areas have a focus on ecological processes affected by human activity and on areas that possess a highly important range of species, habitats and ecological processes. A coherent network of MPAs should be established in 2010.

### ***2. Fisheries management will be more and more determined by other sectors***

Traditionally fisheries management in Europe is being shaped under the CFP. With the coming about of other, more environment oriented directives, such as the Bird and Habitat directive, the Natura 2000 framework, the water directive and, off late, the Marine Strategy Framework Directive and the Maritime Policy, marine and maritime policy, influencing fisheries, is increasingly being shaped elsewhere. These (new) policies have a difference in focus (between economic and ecological aims), include different stakes (and hence stakeholders) and focus on different ways of setting rules (between challenging and integrative to instrumentally state imposed) (van Hoof and van Tatenhove 2009). With for example the MSFD's objective of good environmental status the sole competence of the CFP to manage fish resource conservation issues is terminated. Also, as we can witness in the Netherlands, the implementation of the policies seeking to regulate the marine environment are not necessarily controlled by the body of government responsible for fisheries but by the ministry of water management. As a consequence, the reform of the Common Fisheries Policy in 2013 will be placed in new legislative boundaries.

### ***3. Participation in integrated planning appears mostly informing and consulting***

All environmental directives like the Birds and Habitat directives, the water framework directive, the Marine Strategy Framework Directive and the Maritime Policy during their process of implementation render attention to participation. However, emphasis is on information and consultation in the early steps of policy formulation (the level of green and white papers). During operationalisation and implementation, environmental directives tend to be put into practice in a rather technocratic way. Environmental policies as for example the water and marine directives, are based on a science based definition of objectives to be achieved (good environmental status) which result in the development of a set of indicators with which environmental processes are being monitored and managed. Operationalising the environmental policy is perceived as a technical matter during which participation of stakeholders involved is not deemed necessary.

For the fisheries sector we hence can conclude that increasingly fisheries policy is shaped elsewhere, mostly in environmental directives. Secondly the participation of the fisheries sector in the development of these new policies is rather limited, due to the basic fabric of participation in the development of these policies. In addition, the fisheries sector is increasingly being confronted with more stakes and stakeholders who on the one hand reduce the overall significance of fisheries in the debate and secondly steer the discussion towards a more environment oriented discourse.

## 6 Factsheet: Dutch fisheries

The Dutch fishing fleet consisted of 831 vessels accounting for a total of 170 000 GT and 333 000 KW in 2007.

The three most important segments in the Dutch fishing fleet are:

- The cutter fishery (345 vessels in 2007) focusing on flatfish (especially sole and plaice) and shrimps (cutters) in the North Sea
- The high sea fisheries (14 vessels) focusing on herring, mackerel and horse mackerel in both EU and non-EU waters
- Shellfish fishing and culture (80 vessels) focusing on mussels oysters and cockles in the southwest coastal area and the Wadden Sea.

These three segments account for 95% of the total value of landing. The small-scale fleet (around 250 vessels), mostly consisting of vessels under 10 meters and targeting a variety of species (e.g. sole, sea bass, lobster) is still of very low importance from an economic perspective (approximately 1% of total value of landings). Many of these vessels operate only for a limited number of trips. Another significant part of the fleet (around 140 vessels) is inactive (no fishing activity at all) and has no economic impact at all.

Fish stocks of all the targeted major species have been declining over the last couple of years. Thus quota for all these fish stocks have also decreased. Especially the coastal water fisheries that target flatfish have been negatively affected by this change. In 2008 and 2009 the quotas have increased again slightly for the flatfish species.

### 6.1 Cutter fisheries

#### *Fleet and fisheries*

The cutter fishery is the most important fishery in terms of value of landings. These vessels fish mainly for shrimp, sole and plaice and other flatfish. The cutter fleet consisted of 345 vessels in 2007; length ranging from 10 till 45 meters and engine power ranging from 70 kW to 2,400 kW. The overall capacity of the segment of the fleet was 214.000 kW .

The cutter fleet mainly consists of shrimp fishers, Euro cutters and larger beam-trawlers. Because of low economic performance the last couple of years, investments in this part of the fleet have stagnated for some years. Virtually no investments were recorded from 2002 – 2007. From 2008 onwards, investments have been increasing slightly as a result of government subsidies. These investments are mainly for other (more ecosystem friendly) gears and for measures to reduce fuel consumption.. The average age of a vessel in this part of the fleet was 27 years in 2007. At the end of 2007, 25 of the mainly larger vessels have been scrapped. Thus the total engine power decreased by 14% to 214.000 kW. The average engine power per vessel decreased in 2006 by 10% to 464 kW.

The main method of fishing used in this part of the fleet is beam-trawling. Almost 85% of the vessels are using this technique. The last couple of years some experimenting has been done with other, lighter gears mainly because beam-trawling is very fuel intensive. Two gears mainly, twin-rig and snurrevod (Danish nets), have been introduced. About 8% of the vessels are using these lighter gears and the share of these vessels is increasing.

The shrimp fishers and Euro cutters mainly fish in the coastal zone, the larger beam-trawlers fish in the North Sea. Most of the vessels fish the whole year round. For a large part of the time, vessels fish in the southern part of the North Sea.

The total landings of the cutter fleet have declined from 90,000 tonnes in 2000 to 77,000 tonnes in 2007. The cutter fleet lands over 50 different species, however the main species are plaice (29%), shrimp (18%), other flatfish species like turbot (17%) and sole (13%). The share of sole and plaice in the total fish landed have declined since 2000 mainly because quota for these species have decreased. The share of non-quoted species, like shrimp, striped red gurnard and mullet has been steadily increasing over the last couple of years.

### *Economic importance*

Total value of landings in this fleet was 270 million Euro in 2007. The value of landings in this sector was higher than previous years, mainly because the shrimp fisheries did very well this year as the price of shrimps was particularly high. The cutter fleet made a small profit (7 million) for the first time in 6 years.

Between 2002 and 2007, fishing effort per vessel increased by almost 15%. Average income in this fleet has increased since 2004 mostly because the vessels have increased their effort. However, since the costs also increased, especially the larger beam-trawlers (that use fuel intensive fishing techniques) are making a loss on average. The costs increase mostly caused by an increase in fuel prices. Especially in 2005 and 2006 the average loss per vessel was quite considerable.

In 2007 the cash flow increased again and the loss has decreased. This can be mainly attributed to an increase in revenue and a decrease in fuel costs. Although the fuel price in 2007 was 41 cents per litre, which is the same as the fuel price in 2006, vessels reduced their fuel consumption, resulting in less fuel costs.

As one of the most fuel intensive segment, the survivability of this fleet is quite threatened by a high fuel price. The fleet has already made some efforts to reduce their fuel consumption which resulted in a lower loss in 2007.

Total revenues in 2008 are estimated to be some 5% lower than in 2007 and total costs will also be lower. Fuel costs are still the most important costs for the beam trawl fleet but meanwhile fishermen are saving substantial quantities and costs. Prices of fuel were on average 0,50 euro (+22%) per litre in 2008. It is expected that beam trawlers will face a (small) loss in 2008. Shrimp vessels (12-24 meters) performed well in 2008. Prices of shrimp went up and catches were good. The smaller trawlers (24-40 meters) performed rather well also. Catches were good and prices for species like squid and red mullets acceptable. All by all it is estimated that the coastal fishery fleet will make a profit of 5-10 million euro.

In 2009 the fuel price has decreased quite dramatically, however the prices of sole and plaice are also decreasing steadily thus the outlook for this segment is still not very good.

Compared to 2001 the employment in the cutter fleet has steadily declined from 1800 FTE to about 1400 FTE in 2007. Since the last decommissioning scheme in 2007 employment has remained stable.

Most of the companies operating in the cutter fleet only exploit 1 vessel (88%) . The financial situation of the cutter fleet has improved slightly since 2005. The liabilities have decreased, mainly because of the decommissioning scheme in 2005, which scrapped 25 vessels. The investments were very low though in the years 2005-2007. These have increased slightly in the last two years.

### *Ecological effects*

The cutter fisheries have two important effects on the ecosystem: discards and bottom disturbance.

Discards in the cutter fisheries consist of overquota fish, undersized fish, non commercial fish species and other organisms. The type of gear, the circumstances and the species and the duration of the haul all play a role in the amount of unwanted by-catch. Studies on discards have been focussed on the beam trawl fishery where fish

discards comprise around 50% of the catch (in weight, period 2002-2006). The production of dead material by the fishery results probably in an increase food supply for scavengers like crabs, cod and different types of birds.

Bottom disturbance results from the targetting of bottom fish with towed gears. Especially the heavy tickler chains of the beam trawl have a large influence on the bottom and its fauna. Research showed that vulnerable species can only survive in less intensive fished areas. In intensive fished areas, the adjusted bottom fauna provides increased food supply for plaice and sole

## 6.2 Large-scale pelagic fishery

### *Fleet and fishery*

The large-scale pelagic segment consists of 14 vessels accounting for a total of around 80,750 GT and 87,610 kW in 2007. The number of vessels has decreased from 17 in 2002 to 14 in 2007. The pelagic fleet is rather small but most of the vessels have a high capacity and landings are almost five times the total landings of the cutter sector. Price levels of pelagic (frozen) fish are traditional much lower than those of most demersal (fresh) fish.

The pelagic trawlers were active on all traditional fishing grounds (mainly North East Atlantic and West African waters) and the main species caught were herring, mackerel, horse mackerel, blue whiting, sardines and sardinellas. Since the year 2006 also some vessels fished in waters around South America (neighbourhood of Chilli) targeting mainly Chilean horse mackerel. All of these vessels are freezer trawlers. With the use of a sonar, these vessels can target fish schools very specifically. The catch is frozen at sea and thus these vessels can stay away from port for several weeks.

### *Economic importance*

Landings had a value of about 135 million euro in 2007. The fleet made a small profit of around 6 million euro in 2007. The total catch was nearly 400,000 tons.

The sector is facing quota problems with regard to blue whiting and herring as well as reduced prices for frozen fish. Employment measured in fulltime equivalents increased by nearly 10% in 2007 compared to the previous year to 508 FTE. Mainly because in the pelagic segment relatively small vessels were replaced by bigger vessels which increased the demand for crewmembers. Total investments were about 5 million euro in 2007. Although this is almost twice as much as the investments in 2006, it is still quite low. There was no investment in new vessels in the fleet, just renovating older vessels.

### *Ecological effects*

Discards and unwanted by-catches are the main ecological by effects of the pelagic fishery. Discard rates vary by region but are generally below 10% of the total catch. The majority of the discards are commercial species (mainly mackerel) that are discarded because of the small size of the fish, the quality of the fish or a shortage of storage capacity. By-catches consist of limited numbers of i.e. sharks, cetaceans and swordfishes and have been reduced by the use of excluders.

## 6.3 Shellfish sector

The shellfish sector can roughly be divided into five different sub sectors: culture of mussels and oysters and fisheries on, spisula, ensis and cockles. Spisula, ensis and cockle fisheries are of limited economic importance and are not described here in further detail.

### *Mussel sector*

The mussel sector is by far the most important and consists of about 50 firms that operate 56 vessels. About 170 persons (in FTE) were employed in the mussel fleet in 2007, including the owners of the vessels. The annual turnover of the mussel sector was 69 million euro.

The mussel sector was economically still doing quite well up to the year 2007. After four very good years (2000-2003) with total net profit of about 35 million on average per year, the total net profit has declined to 23 million in 2006. In 2007 the total net profit increased again to 33 million Euro. Most of the individual companies made a profit and were able to meet repayment obligations easily. The overall financial position of the sector is good. The total equity capital of the sector (25 – 35 million Euro) has declined by 10% in 2005 but has stayed fairly constant since. Total capital from outside was about 15 million Euro. There were hardly any investments in the shellfish fleet in 2007. No new vessels or engines were purchased.

Large cost items were personnel costs (22%) and other operational costs (25%). Energy and interest costs are relatively low in this sector. The area on which the mussels are grown has to be leased and the lease costs are about 10% of the total costs.

The biggest constraint to the sector is the availability of spat. The government allows less spat to be caught than the sector would want. Since February 2008 spat fishing has been completely prohibited although it seems likely that from November 2008 some spat fishing licenses will be issued (see also under ecological effects).

### *Oyster sector*

Around 32 companies produce oysters in the Oosterschelde and the Grevelingenmeer. Oysters are grown on so called oyster plots which are rented from the government. So far, 1500 ha oyster plots are rented out on the Oosterschelde and 500 ha on the Grevelingenmeer. Species cultivated in the Netherlands are the Japanese oyster or creuse (*Crassostrea gigas*) and the endemic European flat oyster (*Ostrea edulis*). About half of the oyster producers (17) also produce mussels. Total employment in the oyster sector is around 75 FTE.

The turnover of the oyster sector was 3.5 million euro in 2007 and 32 million pieces of oysters.

From 2002 -2007, the oyster production has been stable around 30 million oysters annually with an estimated total value of around 3 million Euro. This production has led to considerable profits in this sector. In 2008, however, available information suggests that the total turnover has dropped by 40-50 percent and net profits have become negative. The sector has a relative high equity capital and low debts (7.7 million Euro of equity capital versus 2.7million Euro of debts).

A fairly large percentage of the labour costs are in the form of unpaid labour. Therefore the employment costs per FTE are rather low at 32,000 Euro. Large cost items in this sector were personnel costs (38% of total costs) and costs made to lease the area on which the oysters are grown (25%).



### *Ecological effects*

The ecological impact of especially the mussel sector has raised a lot of attention over the last year. The mussel sector uses wild spat to grow mussels. Until 2008 spat fishery in the Wadden Sea was allowed but limited, which limited the production of mussels for the last 5 years. In January 2008 spat fisheries was prohibited completely in the Waddensee due to concerns on the environmental sustainability of this activity and the effects on the natural mussel banks. Because import of spat from other EU countries is also limited, this threatened the survival of the mussel sector. After negotiations with the environmental NGOs and the ministry, spat fishing is allowed again on a limited basis since the fall of 2008. However, before 2020 the spat fishery has to be replaced completely by the use of spat collection devices (MZIs). Different types of such devices are currently tested.

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# Justification

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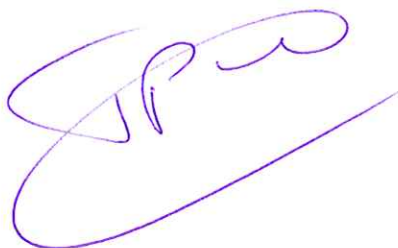
The scientific quality of this report has been peer reviewed by a colleague scientist and the head of the department of Wageningen IMARES.

Approved: Dr. C. Röckmann (Co-editor)  
Scientific researcher

Signature: 

Date: 26 June 2009

Approved: Dr. ir. T.P. Bult  
Head of Fisheries Department

Signature: 

Date: