Definition of EU fishing fleets for economic data collection: What are we aiming for?

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Abstract
From 2004 onwards, each EU member state is obliged to collect economic information on their fishing fleets (EU reg. 1639/2001). This information is to provide advice to the commission on the management of EU fishing fleets. Within the regulation, fishing fleets are defined as in the EU fishing fleet register. This implies that Member States also have to submit data of a large number of inactive vessels. E.g. for the Netherlands economic information has to be provided for over 900 vessels of which only around 45% is commercially active in the sea fisheries. The other vessels do not fish on a commercial basis and do not represent any economic value. Thus, including these vessels in economic models would bias the results. This paper:

1. Examines how the regulation on data collection of economic data is implemented in The Netherlands.
2. Characterizes the group of so-called "commercially inactive vessels" in the Netherlands in comparison to the commercially active fleet.
3. Describes the consequences of including these vessels in the data collection program.

The main conclusion that can be drawn from this analysis is that the economic importance of the commercially inactive vessels is negligible. However, including these vessels in the sampling population has important impacts, both on the sampling effort and on the outcomes of the sampling program.
Based on this conclusion, it is proposed to distinguish between active and inactive vessels based on a minimum income from fishing, as is used in the agricultural data collection system. Collection of economic data could be restricted to active commercially active fleet segments.

1 Introduction

From 2001 onwards all EU member states are obliged to collect information on biological and economic aspects of their fisheries as set out in the EU data regulation (EU 1639, 2001). The goal of this data regulation is to provide the basic data needed for the assessment of the biological status of the fish stocks and the economic consequences of possible management measures for the fisheries. Within the regulation, fishing fleets are defined as in the communal fishing fleet register. However, in several member states additional criteria are used to define a so called 'commercially active' fleet from which economic data are gathered. E.g. for the Netherlands economic information has to be provided for over 900 vessels. However, by working with an income limit of 50,000 Euro per year, only 400 vessels are taken into account (National program 2004). Despite comments from several member states, the European Commission holds on to the definition of the EU fleet register for the economic data collection program and also for the planned new data regulation that will be implemented in 2009. On the other hand no studies have been done on the effects of including or excluding commercially inactive vessels in the economic data collections programs. The purpose of this paper is to facilitate this discussion by:

1. Examining how the regulation on data collection of economic data is implemented in The Netherlands.
2. Characterizing the group of so-called "commercially inactive vessels" in The Netherlands in comparison to the commercially active fleet.

3. Describing the consequences of including these vessels in the data collection program.

2 The legislative context

The registration of fishing vessels is covered by both European and National legislation. Here we describe the European legislative system and the legislative systems of The Netherlands.

2.1 EU data regulation

According to EU regulation 1639/2001, all member states should collect economic information from their “commercial fishing fleets”. These “commercial fishing fleet” are defined as: “vessels registered and licensed, according to Council Regulation No 3690/93 (2) or otherwise authorized to fish for the purpose of commercial exploitation of fisheries”

EU regulation no 3690/93 sets out the obligations for the member states and their fishermen, concerning the fishing license system. It is based on the definition of the fishing fleet in EU regulation 3760/92. In this regulation the fishing vessel is defined as “any vessel equipped for commercial exploitation of resources”. Also in later legislation concerning the fishing vessel register (No 109/94 and No 2090/98), reference is made to this definition. This means that all vessels, carrying commercial fishing gear should have a fishing license and no fishing is allowed without one (No 3690/93). Moreover, member states must keep a fishing vessel register, including all vessels carrying commercial fishing gear, disregarding their activities (No. 2090/98).

2.2 National data regulations in member states

2.2.1 Netherlands

In the Dutch system only fishing vessels may carry commercial fishing gear (trawls, seines, fixed nets and other such gears) (Regulation on catch limitation, art. 3). All sea going fishing vessels are obliged to have a fishing license and are to be registered in the National fishing vessel register (Regulation on fishing license). In order to get a fishing license, the vessel has to be included in the National fishing vessel register. Thus, the license is suspended whenever the vessel is not included in the vessel register anymore (Regulation on fishing license).
Many vessels that are not fishing on a commercial basis have always been included in the Dutch fishing vessel register. In 1994, a bill was passed to deal with this problem and to clear the vessel register from non-commercial fishing vessels. Each vessel owner was obliged to submit a statement on the commercial activities of the vessel together with an audit certificate on the activities of the vessel. In order to stay in the vessel register, these certificates had to be submitted to the ministry annually before the 1st of April. In case of transfer of vessels, the new owner had to submit a statement on the commercial activities and the former owner an audit certificate of the year before. This action resulted in a deregistration of 600 vessels, approx. 35% of the total number of vessels registered at the time.
In the years after this event it became clear that a tailor-made audit certificate could not be made for each vessel, and that the distinction between commercial and non-commercial vessels could also be based on the on catch statistics in the official catch database. Having concluded this, and taking into consideration the financial burden of the annual audit certificate for the sector, the ministry decided to drop the requirement for the audit certificate.
Nowadays, a vessel remains in the vessel register for the present year, as long as any landings of the vessel have been registered in the landings database during last year. In case no landings

have been registered, the vessel owner has to provide evidence that the vessel has been operated by means of e.g. sale notes of fish.
Although vessels less than 10 meter do not have a European obligation to fill in a logbook, these vessels have to provide evidence for their commercial activities at the end of each year to remain registered. Therefore, the ministry obliged owners of vessels under 10 m to register all their landings, including those under 50kg in logbooks from 2003 onwards.

3 The Dutch inactive fleet: a characterization

3.1 Materials and Methods

3.1.1 Data sources

Data were used from four five sources:
Information on effort and landings was retained from the official landings database (VIRIS). In this database information is available on effort and landings for all vessels that have to fill in a European log-book. In The Netherlands, also captains of vessels less than 10m have to fill in a logbook to prove that they are operating on a commercial basis. For these vessels, even landings under 50kg have to be reported, in contrast with the EU logbook regulation that requires only landings over 50kg per species and trip to be recorded.
In order to be able to calculate revenues, average monthly auction prices were used provided by the Dutch Fish Product Board.
The official vessels register was used to get technical details of the vessels, and to valuate the material assets, whereas information on the individual transferable quota (ITQ) from the ministry of Agriculture was used to valuate the immaterial assets.
Economic information on the active fleet was retained from the LEI panel (Taal et al 2005). LEI has gathered economic data from the Dutch fisheries for over 40 years. Accounts of around 25% of the total fleet are collected in detail and analyzed, to get a clear view of trends in the economic position of the fleet.

3.1.2 Methods used

Classification vessels
Data analyses were carried out for all vessels that were in the official vessels register on 31st December 1994. Vessels were classified according to their fishing activities in 1994 as recorded in the logbook database. In case vessels used more than one gear and none of the gears was used in more than 50% of the fishing days, vessels were classified as polyvalent gears. Vessels for which no information on fishing activities was available (315 vessels), were classified based on the MAGP segmentation, on the availability of fishing licenses and on the official gears registered in the vessel register (Table 1).

Table 1: Classification of vessels according to EU classification (EU regulation 1639/2001) based on gear used, official gear, MAGP segment and EU fishing license.

Main gear used/ registered gear	MAGP segment	EU-license	Classification
Beam trawl , shrimp trawl	n.a.	1	Beam trawl
Bottom otter trawl, bottom pair trawl, Danish seine, Scottish seine	n.a.	1	Demersal trawls and seiners
Pelagic otter trawl, pelagic pair trawl, purse seine	n.a.	1	Pelagic trawls and seiners

Dredges	n.a.	1	Dredges
Longlines, set lines, drifting lines, Hand-lines and pole-lines (hand operated	n.a.	1	Gears using hooks
Gillnets (not specified), Encircling gillnets, drift nets, fixed gillnets (on stakes), set gillnets (anchored)	n.a.	1	Drift nets and fixed nets
Pots	n.a.	1	Pots and traps
No main gear	n.a.	1	Polyvalent gears
n.a.	4J7	1	Aquaculture
n.a.	4J7	0	Inland fisheries

Within the Dutch data collection system, vessels are classified as being commercially active, if landings value exceeds 50.000 Euro. Only the vessels that are classified as commercially are included in economic data collection. Total landings value was estimated, from landings and monthly average prices.

Characterization inactive and active vessels

The inactive and active vessels were characterized and compared on different types of characteristics: (1) technical characteristics, (2) effort and landings and (3) economic characteristics.
Technical characteristics of the vessel that were examined were: gross tonnage, engine power, vessel age and engine age.
Effort and landings per vessel were retained from the logbooks. The measure of effort used was the total time spent at sea, expressed as the number of days at sea. Landings were calculated in live weight.
Economic characteristics of the vessels that were examined were some of the important economic indicators used in the DCR: landings value, employment and investment (EU reg. 1639/2001). Income was estimated, from landings and monthly average prices. Employment in the fishery was expressed both as the number of people involved in the fishery and the number of man days made on board of the vessels. Since no accurate information on the number of fishermen per vessel was available for the inactive vessels, this number was estimated, based on the minimum number of crewmembers required by the safety regulations for seagoing vessels **(ref Besluit zeevisvaartbemanning)** (Table 2).

Table 2: Minimum number of crew members, required by the safety regulations for different categories of seagoing vessels **(Besluit zeevisvaartbemanning**).

Length over all (m)	Engine power (kw)	Crew members
<24	<750	3
24-45	<1125	5
24-45	1125-3000	6
24-45	3000-6000	7
45-60	1500-3000	8
45-60	3000-6000	9
60>	<3000	9
60>	>3000	10

The total invested capital was estimated, based on the value of the vessel and the value of the ITQ's connected to it. The total value of the hull and the engine (room) was used as a proxy for the value of the vessel. Replacement values were estimated normatively (Table 3). The norms used to calculate the value of the hull and engine, were based on regression analyses of actual prices and technical characteristics of vessels for all categories except for hulls < 20 GT (Davidse W.P. et al., 1993). For this last group, norms were based on expert knowledge of fisheries technologists. Both hulls and engines were depreciated digressively to estimate their actual value using the age as recorded in the official vessel register (Table 1). Average prices of ITQ's were based on prices from ITQ transactions in 2004.

Table 3: Methods and constants used to valuate the invested capital.

Constant	Value
Value of hull < 20 gt (Euro)	10,000 * gt + 16,000
Value of hull 20 – 70 gt (Euro)	12,118 * gt + 31,887
Value of hull > 70 gt (Euro)	3,006 * gt + 538,090
Value of engine room (Euro)	1,133 * kw
Depreciation hull (small vessels)	3.2% degression, 27 yr
Depreciation hull (large vessels)	3,0% degression,20 yr
Depreciation engine (small vessels)	4,9% degression, 15 yr
Depreciation engine (large vessels)	9.3% degression, 10 yr
Value of sole ITQ (euro/kg)	27.0
Value of plaice ITQ (euro/kg)	9.0
Value of cod ITQ (euro/kg)	7.2
Value of whiting ITQ (euro/kg)	3.5
Value of herring ITQ (euro/kg)	0.9
Value of mackerel ITQ (euro/kg)	1.0
Value of blue whiting ITQ (euro/kg)	0.5
Value of horse mackerel ITQ (euro/kg)	0.9

Of all characteristics described, average values were calculated for each group (active and inactive vessels per fleet segment) and where possible differences between active and inactive vessels were tested using simple t-tests. Besides, total effort, landings, income, employment and investment were calculated to show the importance of active and inactive vessels for the Dutch fishing fleet.

Including inactive vessels in the data collection program would have considerable consequences for needed sampling effort and fleet results. To show the effects on sampling effort and sample size required, estimates of effort, landing value and investment were calculated, based on three scenarios:

1. Only commercially active vessels are considered
2. Both inactive and active vessels are considered, the sampling program is stratified according to the level of activity, the number of sampling units in each stratum are calculated, based on Neymann allocation.
3. Both inactive and active vessels are considered, but the sampling program is not stratified according to the level of activity.

3.2 Results

3.2.1 Fleet stratification

Table 4: Fleet segmentation of all vessels registered in the official vessel register at 31st December 2004, according to the EU data regulation and according to their activity. The number of commercially active vessels (total value of landings of at least 50.000 € in 2004) is given in brackets.

	0 - 12m	12 - 24m	24 – 40m	>40m	Total
Beam trawl	23 (0)	196 (176)	55 (52)	101 (101)	362 (329)
Demersal trawls and seiners	22 (0)	24 (17)	19 (17)		65 (34)
Pelagic trawls and seiners		12 (1)		17 (17)	29 (18)
Dredges		28 (4)		19 (1)	47 (5)
Gears using hooks					20 (0)
Drift nets and fixed nets	148(2)		20 (4)		124 (6)
Pots and traps		9 (0)			33 (0)
Polyvalent gears	52 (2)		14 (4)		66 (6)
Total sea fishery	**253 (4)**	**263 (199)**	**104 (76)**	**139 (119)**	**759 (398)**
Aquaculture and inland fishery*	12	60	78	19	169
Total	**265 (4)**	**323 (199)**	**182 (76)**	**158 (119)**	**928 (398)**

* Because landings of aquaculture and inland vessels are not included in the VIRIS catch database, no distinction is made between active and inactive vessels in this group.

Table results show that the Dutch fleet includes 398 commercially active vessels involved in sea fishing activities. Besides these vessels, 361 vessels are registered, but are not commercially active. Another 169 vessels are used for aquaculture (predominantly mussel culture) and inland fisheries and are not taken into account in the other analyses. The vessels used for aquaculture have only recently (2003) been included in the EU-licensing system and for these vessels, economic data collection will start this year, covering the year 2004 onwards.

3.2.2 Technical characteristics

In general inactive vessels are smaller and older than active vessels (Table 5). For the size of the vessel and the capacity of the engine the differences are most evident; in 6 of the 11 segments in which comparison between active and inactive vessels is possible, the engine power of inactive vessels is lower than that of active vessels. The size of the vessel is smaller in 4 segments. In the other segments, the differences are not significant. The age of the vessel and the engine differ between active and inactive vessels in 6 and 5 segments respectively. Only in 2 segments, vessels over 12 m. using polyvalent gears and vessels over 40 m using dredges, are the active vessels older than the inactive vessels. The number of vessels concerned is small however (4 and 1 active vessels resp.). In 5 segments comparison between inactive and active vessels is not possible because all vessels are either inactive or active.

Table 5: Average technical characteristics of active and inactive vessels in the whole fleet and in the different fleet segments as registered in the official vessel register at 31st December 2004. Significant differences are shaded ($p < 0.05$).

Length (m)	Gear	Gross tonnage (GT)		Engine power (KW)		Age vessel		Age Engine	
		inactive	active	inactive	active	inactive	active	inactive	active
	Overall	10	144	67	474	19	17	12	7
0-12	Beam trawl	2	n.a.	24	n.a.	15	n.a.	14	n.a.
0-12	Dem. trawls/seiners	3	n.a.	29	n.a.	14	n.a.	12	n.a.

0-12	Passive gear	2	9	15	217	14	4	11	5
0-12	Polyvalent gears	1	1	20	14	14	9	11	4
0-24	Pel. trawls/seiners	4	19	47	88	12	86	9	19
0-40	Dredges	72	214	240	721	37	26	18	21
12-24	Beam trawl	31	57	145	199	27	21	9	7
12-24	Dem. trawls/seiners	17	90	78	220	30	16	19	5
12-40	Pots and traps	27	n.a.	86	n.a.	26	n.a.	27	n.a.
12-	Drift nets, fixed nets	26	48	136	173	27	25	14	13
12-	Polyvalent gears	25	77	127	194	30	73	14	33
24-40	Beam trawl	138	202	401	694	42	21	25	7
24-40	Dem. trawls/seiners	72	152	191	409	70	21	32	7
40-	Beam trawl	n.a.	459	n.a.	1,631	n.a.	11	n.a.	8
40-	Pel. trawls/seiners	n.a.	4,527	n.a.	5,259	n.a.	10	n.a.	10
40-	Dredges	240	257	651	191	21	50	9	50

3.2.3 Effort and Landings

As expected because of the selection criteria for active vessels, inactive vessels have low effort and landings (Fig. 1, table 6). Of the 759 vessels involved, 146 did not take part in the fishery at all during 2004. Most of the inactive vessels that did participate in the fishery only made very few sea days (up to 40), resulting in landings up to 10.000 kg at maximum.
The figures also show, however, that there is no clear distinction between the effort and landings of active and inactive fishing vessels.

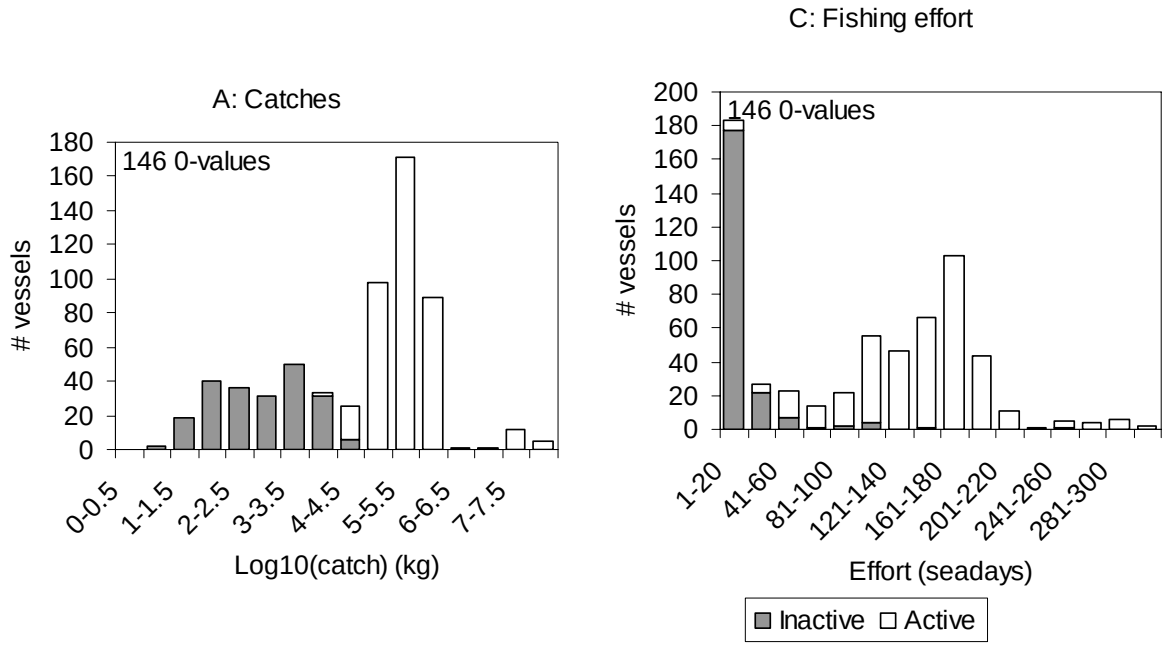

Fig 1: Landings, value of landings and effort in 2004 of all Dutch vessels, registered on 31st of December 2004.

On average, inactive vessels only spent 7 days at sea during 2004 and the total effort of these vessels added less than 5% tot the total effort of the Dutch fleet (table 6). In most of the segments, the average number of sea days was less than 10, whereas active vessels spent on average 146 days at sea. An exception to this was the group of inactive beam trawl vessels from

24 – 40 m (32 sea days), but this is mainly due to one vessel that takes out tourists to watch seals during most of the year.
The difference in average landings between active and inactive vessels is even more apparent than the difference in effort; the average landings of inactive vessels was less than 1,000 kg, whereas the average catch of the active vessels was 1,313,000 kg. Because of this the inactive vessels added only 0.08 % of the total catch of the Dutch fleet. Especially commercially inactive vessels using dredges and pots and traps had low landings; 27 and 4 kg/vessel respectively. Thus it is clear that the so called inactive vessels are completely negligible with regard to their total effort and landings.

Table 6: Average effort and landings in 2004 of active and inactive vessels in the whole fleet and in the different fleet segments as registered in the official vessel register at 31st December 2004.

Length (m)	Gear	Effort (sea days)				Catch (*1000 kg)			
		Average		% of total		Average		% of total	
		Inact.	Active	Inact.	Active	Inact.	Active	Inact.	Active
0-12	Beam trawl	0	n.a.	0.02	0.00	0	n.a.	0.00	0.00
0-12	Dem. trawls/seiners	1	n.a.	0.05	0.00	1	n.a.	0.00	0.00
0-12	Passive gear	8	38	1.92	0.12	1	14	0.03	0.01
0-12	Polyvalent gears	11	78	0.95	0.26	1	19	0.01	0.01
0-24	Pel. trawls/seiners	8	21	0.15	0.04	2	12	0.00	0.00
0-40	Dredges	1	107	0.02	0.70	0	299	0.00	0.23
12-24	Beam trawl	9	125	0.31	36.29	5	103	0.02	3.45
12-24	Dem. trawls/seiners	2	139	0.02	3.91	1	150	0.00	0.49
12-40	Pots and traps	1	n.a.	0.01	0.00	0	n.a.	0.00	0.00
12-	Drift nets, fixed nets	9	57	0.25	0.38	2	16	0.01	0.01
12-	Polyvalent gears	17	35	0.28	0.23	4	160	0.01	0.12
24-40	Beam trawl	32	152	0.16	13.10	5	224	0.00	2.23
24-40	Dem. trawls/seiners	6	162	0.02	4.54	2	284	0.00	0.92
40-	Beam trawl	n.a.	171	0.00	28.56	n.a.	405	0.00	7.81
40-	Pel. trawls/seiners	n.a.	274	0.00	7.71	n.a.	26,027	0.00	84.59
40-	Dredges	0	6	0.00	0.01	0	220	0.00	0.04
	Overall	7	146	4.16	95.84	1	1,313	0.08	99.92

3.2.4 Economic value

Value of landings
In 2004, the inactive fishing vessels only contributed 0.4% of the total value of all landings registered. In most fleet segments, average value of landings of inactive vessels was below €10,000, whereas the average value of landings of active vessels was over €100,000. Only inactive beam trawlers from 24-40 m had a higher landings value (€15,400 average).
The pelagic trawlers and the beam trawlers over 40m added most to the total value of the landings (34% and 37%).

Table 7: Average value of landings in 2004 of active and inactive vessels in the whole fleet and in the different fleet segments as registered in the official vessel register at 31st December 2004.

Length (m)	Gear	Value of landings (* 1000 €)			
		Average		% of total	
		Inact.	Active	Inact.	Active
0-12	Beam trawl	0.3	n.a.	0.00	0.00
0-12	Dem. trawls/seiners	1.1	n.a.	0.01	0.00

0-12	Passive gear	4.0	86.9	0.16	0.05
0-12	Polyvalent gears	4.0	103.3	0.05	0.06
0-24	Pel. trawls/seiners	7.8	67.6	0.02	0.02
0-40	Dredges	0.1	646.5	0.00	0.71
12-24	Beam trawl	9.7	237.5	0.05	11.43
12-24	Dem. trawls/seiners	0.6	404.0	0.00	1.88
12-40	Pots and traps	0.0	n.a.	0.00	0.00
12-	Drift nets, fixed nets	10.1	90.0	0.04	0.10
12-	Polyvalent gears	7.2	344.0	0.02	0.38
24-40	Beam trawl	15.4	739.7	0.01	10.51
24-40	Dem. trawls/seiners	1.1	677.3	0.00	3.15
40-	Beam trawl	n.a.	1,343.5	0.00	37.09
40-	Pel. trawls/seiners	n.a.	7,354.4	0.00	34.18
40-	Dredges	0.0	304.8	0.00	0.08
	Overall	4	916.0	0.38	99.62

Employment

Based on the minimum number of crewmembers required by the safety regulations for seagoing vessels, 2,993 fishermen should be engaged in operating the Dutch fleet. Of these, 1,180 (39%) are attributed to inactive vessels, mainly in vessels under 12m (more than 700 crew members) and vessels using dredges (202 crew members). For the active vessels, 80% of all crew members (1, 441) are employed by beam trawlers.

Although the estimated amount of crew members in the inactive vessels is relatively large, the working days made by the crewmembers of inactive vessels is negligible, compared to the effort of the crewmembers of the active vessels (2.7%). This is due to the very low effort of the inactive vessels; 518 crew members are attributed to vessels with no effort at all in 2004 and for the other vessels, effort is very low. This means that if we assume an FTE to equal 159 working days (average for the active fleet), that the total inactive fleet only accounts for 50 FTE.

Table 8: Estimated total crew and total working days in 2004 of active and inactive vessels in the whole fleet and in the different fleet segments as registered in the official vessel register at 31st December 2004.

Length (m)	Gear	Total crew				Working days			
		Total		% of total		Total		% of total	
		Inact.	Active	Inact.	Active	Inact.	Active	Inact.	Active
0-12	Beam trawl	69	0	2.3	0.0	31	0	0.0	0.0
0-12	Dem. trawls/seiners	66	0	2.2	0.0	85	0	0.0	0.0
0-12	Passive gear	438	6	14.6	0.2	3,492	226	1.2	0.1
0-12	Polyvalent gears	150	6	5.0	0.2	1,717	467	0.6	0.2
0-24	Pel. trawls/seiners	33	3	1.1	0.1	280	64	0.1	0.0
0-40	Dredges	112	20	3.7	0.7	36	2,131	0.0	0.7
12-24	Beam trawl	60	528	2.0	17.6	566	65,935	0.2	22.3
12-24	Dem. trawls/seiners	21	51	0.7	1.7	43	7,092	0.0	2.4
12-40	Pots and traps	29	0	1.0	0.0	21	0	0.0	0.0
12-	Drift nets, fixed nets	54	14	1.8	0.5	547	836	0.2	0.3
12-	Polyvalent gears	32	16	1.1	0.5	508	598	0.2	0.2
24-40	Beam trawl	16	287	0.5	9.6	487	44,117	0.2	14.9
24-40	Dem. trawls/seiners	10	85	0.3	2.8	62	13,730	0.0	4.6
40-	Beam trawl	0	627	0.0	21.0	0	107,235	0.0	36.3
40-	Pel. trawls/seiners	0	165	0.0	5.5	0	45,336	0.0	15.3
40-	Dredges	90	5	3.0	0.2	0	30	0.0	0.0

	Overall	1,180	1,813	39.4	60.6	7,875	287,796	2.7	97.3

Investment

The estimated total invested capital in the Dutch fleet equals almost 1 billion €, from which 95% is accounted for by the active fleet (Table 9). Especially beam trawlers and large pelagic trawlers add considerably to the total value (62% and 30%). For the inactive vessels, the segments of small beam trawlers, small vessels using passive gears and vessels over 12m using gill nets add considerably to the total invested capital (0.74%, 1.3%, 0.85%), but the invested capital in these segments is very small compared to the active fleet.

Of the total capital invested, 29% (305 milj. €) is the value of the vessel whereas 71% (738 milj. €) is the value of the ITQ. Owners of inactive vessel invest less in ITQ than owners of active vessels. For inactive vessels the value of the ITQ comprises 62% of the total invested value, whereas for active vessels the ITQ comprise 71%. There is, however, considerable variation between the fleet segments. In the segment of the small beam trawlers, 97% of the total value comes from the ITQ, which might be due to temporally parking of ITQs. For several other segments the value of the ITQ is 0. For some of them (e.g. dredges) this may not indicate inactivity, as these vessels target non-quota species, but for other segments, like the segments of vessels operating demersal trawls and seines, the absence of quota is a clear indication of inactivity.

Table 9: Estimated total investment in the vessel and in the ITQ (* 1,000,000 €) of active and inactive vessels in the whole fleet and in the different fleet segments as registered in the official vessel register at 31st December 2004.

Length (m)	Gear	Vessel		ITQ		Vessel and ITQ total		% of total	
		Inact.	Active	Inact.	Active	Inact.	Active	Inact.	Active
0-12	Beam trawl	0.23	0.00	7.52	0.00	7.75	0.00	0.74	0.00
0-12	Dem. trawls/seiners	0.58	0.00	1.58	0.00	2.15	0.00	0.21	0.00
0-12	Passive gear	2.66	0.43	10.50	0.74	13.16	1.17	1.26	0.11
0-12	Polyvalent gears	0.99	0.05	3.81	0.00	4.80	0.05	0.46	0.01
0-24	Pel. Trawls/seiners	0.63	0.01	0.00	0.00	0.63	0.01	0.06	0.00
0-40	Dredges	3.78	0.25	0.00	0.00	3.78	0.25	0.36	0.02
12-24	Beam trawl	3.81	40.86	2.49	52.59	6.31	93.45	0.60	8.96
12-24	Dem. trawls/seiners	0.26	6.07	0.00	8.15	0.26	14.21	0.02	1.36
12-40	Pots and traps	0.66	0.00	0.00	0.00	0.66	0.00	0.06	0.00
12-	Drift nets, fixed nets	1.84	0.35	6.96	1.20	8.80	1.55	0.84	0.15
12-	Polyvalent gears	0.94	0.13	0.05	0.00	0.98	0.13	0.09	0.01
24-40	Beam trawl	0.13	19.18	0.02	92.95	0.15	112.13	0.01	10.75
24-40	Dem. trawls/seiners	0.06	6.38	0.00	9.11	0.06	15.49	0.01	1.48
40-	Beam trawl	0.00	91.10	0.00	345.86	0.00	436.96	0.00	41.88
40-	Pel. Trawls/seiners	0.00	120.03	0.00	194.84	0.00	314.87	0.00	30.18
40-	Dredges	3.58	0.05	0.00	0.00	3.58	0.05	0.34	0.01
	Overall	20	285	33	705	53	990	5.09	94.91

3.2.5 Effects of inactivity on sampling effort and on outcomes

Including inactive vessels in the sampling program will increase the required sampling effort considerably. Depending on the indicator, the total number of vessels from which information must be obtained should be increase by a factor 3 – 9 (3, 5 and 9 for investment, income and effort respectively) (Table 10). This large increase is mainly due to the highly diverse segments

of vessels under 12 m. Only in the segment using passive gears more than 100 vessels should be included in the sampling program to attain the prescribed level of accuracy for the different economic indicators, more than the number of vessels needed to get accurate estimates for effort and income for the whole active fleet. Stratification based on the level of activity reduces the needed number of samples considerably, especially in case of the estimates of effort and value of the landings. For these variables, stratification reduces the required number of vessels by 15% and 31% respectively, whereas the reduction in the required number of vessels to estimate the investment was only 5%.

Table 10: Effect of including inactive vessels in the economic sampling program on the sample size needed to attain the prescribed level of accuracy (25% of the average) in the estimates of effort, value of landings and investment in the whole fleet and in the different fleet segments as registered in the official vessel register at 31st December 2004. Active: only active vessels included in population; Strat: all vessels included in population, stratification according to active/inactive using Neymann allocation; All: all vessels included in population, no stratification.

Length (m)	Gear	Effort			Value of landings			Investment		
		Active	Strat.	All	active	Strat.	All	Active	Strat.	All
0-12	Beam trawl	0	22	22	0	23	23	0	22	22
0-12	Dem. trawls/seiners	0	21	21	0	22	22	0	20	20
0-12	Passive gear	2	109	109	2	84	109	2	114	115
0-12	Polyvalent gears	2	40	44	2	21	48	2	47	49
0-24	Pel. trawls/seiners	1	12	12	1	11	12	1	11	12
0-40	Dredges	4	6	27	4	4	27	4	20	22
12-24	Beam trawl	6	7	12	23	24	30	87	91	92
12-24	Dem. trawls/seiners	4	5	15	7	8	16	14	14	20
12-40	Pots and traps	0	9	9	0	9	9	0	9	9
12-	Drift nets, fixed nets	3	14	17	3	13	18	4	17	20
12-	Polyvalent gears	4	13	13	4	5	14	4	11	13
24-40	Beam trawl	4	5	6	15	16	18	20	21	22
24-40	Dem. trawls/seiners	2	2	7	11	12	13	11	11	13
40-	Beam trawl	2	2	2	6	6	6	9	9	9
40-	Pel. trawls/seiners	2	2	2	7	7	7	9	9	9
40-	Dredges	1	3	2	1	3	19	1	11	11
	Total	37	272	320	86	268	391	168	437	458

Including the inactive vessels in the sampling population has considerable consequences for the estimated values as well. Overall, average estimated values per vessel are reduced by 45% for all indicators. For effort and value of landings the reductions are similar for the different segments and vary between 0% for the large beam trawlers and pelagic trawlers (no inactive vessels) to 95% for the large dredgers. For many important segments in terms of value of landings, the bias is relatively small (< 30%), as few vessels are inactive in these segments, but for other segments the bias is large (30%-90%). The bias in average value of the investments does not show the same pattern as for the effort and the value of the landings. For segments that are important in terms of value of landings, the average investment value is reduced, when inactive vessels are included, whereas for segments that are not important in terms of value of landings, the average investment value is higher.

Table 11: Effect of including inactive vessels in the economic sampling program on the average values of effort, income and investment per vessel in the whole fleet and in the different fleet

segments as registered in the official vessel register at 31st December 2004. The bias is expressed as the percentage of the estimated value for the active fleet.

Length (m)	Gear	Effort (sea days)			Value of landings (* € 1000)			Investment (* €1000)		
		Active	All	bias	active	all	bias	Active	all	bias
0-12	Beam trawl	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
0-12	Dem. trawls/seiners	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
0-12	Passive gear	38	8	-78	87	5	-94	587	97	-83
0-12	Polyvalent gears	78	14	-82	103	8	-92	26	93	255
0-24	Pel. trawls/seiners	21	10	-55	68	13	-81	8	53	548
0-40	Dredges	107	16	-85	647	92	-86	62	144	132
12-24	Beam trawl	125	113	-9	238	214	-10	531	509	-4
12-24	Dem. trawls/seiners	139	99	-29	404	286	-29	836	603	-28
12-40	Pots and traps	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
12-	Drift nets, fixed nets	57	19	-67	90	26	-71	387	518	34
12-	Polyvalent gears	35	22	-37	344	103	-70	32	79	151
24-40	Beam trawl	152	146	-4	740	700	-5	2,156	2,042	-5
24-40	Dem. trawls/seiners	162	145	-10	677	606	-11	911	819	-10
40-	Beam trawl	171	171	0	1,343	1,343	0	4,326	4,326	0
40-	Pel. trawls/seiners	274	274	0	7,354	7,354	0	18,522	18,522	0
40-	Dredges	6	0	-95	305	16	-95	52	191	265
	Overall	146	80	-45	916	482	-47	2,488	1,375	-45

4 Discussion and conclusions

4.1 Characteristics of the Dutch inactive fleet

The goal of this exercise was to present an indication as of the characteristics of the inactive vessels and what the effects would be if these vessels would be included in the Dutch sampling program for economic information. For this purpose the data sources and methods are appropriate, although some drawbacks can be mentioned:

- For the estimates of effort and landings, data were used from the official logbook database. For vessels over 10 m there is a threshold of 50 kg per species per trip for registering landings so for larger vessels the landings might be underestimated although the possible bias is small. Vessels under 10 m should register all their landings because of National legislations, so for this group there is no problem.
- The value of the landings was calculated based on monthly average auction prices, which might differ for different fishing methods, depending on the quality of fish and the size. Although the effects of price differences might be considerable for individual species and vessel, the overall effect is assumed to be negligible.
- Total employment was based on the minimal number of crew members required for operating fishing vessels at sea by Dutch legislation. The estimates produced in this paper should therefore be regarded as a minimum estimate. For the large pelagic trawlers, this is evident as the total number of crew members (631) (Taal et al, 2005) is much larger than estimated here (165). This is mainly due to the fact the fish is processed and frozen on board of these large vessels. Apart from this group, the estimate of the total number of crew members for the commercially active fleet fits well with the other estimates of the employment: based on a representative sample of 25% of the total population the total employment for the segments of commercially active beam trawlers and demersal

trawlers and seiners was 1568 in 2004 (Taal et al, 2005), whereas the estimate for these segments was 1578. However, for vessels under 12 m the number of fishermen might very well be lower than estimated as the legislation on minimum number of crewmembers is not enforced.

- The estimate of the total investment is most uncertain. For the active vessels in the Dutch fleet, accurate information on purchase prices is available and the norms are based on this information. For the other segments, norms have been based on expert knowledge in absence of information on purchase prices. The actual prices may in fact vary a lot because of the wide variety of fishing gears used and types of vessel. This problem is not specific for the Netherlands. Currently, a European wide study is done on the valuation of the invested capital to provide standardized methodology for all EU member states (Evaluation of the Capital Value, Investments and Capita Costs in the Fishery Sector, Tender No FISH/2005/03). Because of this, the numbers here presented should be regarded as indicative. The same holds for the value of the intangible assets (ITQ) but for a different reason. ITQ's were valuated using the average market price, but there is considerable discussion on whether this is the right way to valuate this type of fishing rights.

Taking into account these considerations on the methods used, we can conclude that, although the estimated characteristics of the different fleet segments might not be very accurate in some cases, the results give a fairly good characterization of the economic importance of the different segments and the inactive so called commercially inactive vessels.

The main conclusion that can be drawn from the results is that the economic importance of the commercially inactive vessels is negligible. Although the inactive vessels represent over 50% percent of the total Dutch fleet, they add 5% or less to the total invested capital, employment and effort and even less than 1 % to the, landings and value of landings. Moreover, the results show that for most of the segments both effort and landings of the inactive vessels do not differ significantly from zero, taking into account the confidence limits set in the DRC.

However, including these vessels in the sampling population has important impacts, both on the sampling effort and on the outcomes of the sampling program. Table 10 shows that the number of sampling units has to be increased by up to a factor 9 in order to attain the prescribed accuracy when inactive vessels are included, although the economic value of these vessels is negligible. Such an extensive input to monitor the economic performance of merely inactive vessels seems to be in conflict with the goal of the European data collection program to be efficient (verwijzing!!).

Although the increase in sampling effort might not be very efficient, this is not expected be a large problem. However, the differences in output will have more serious consequences for the quality of the economic advice. Over the last few years, the results of the Concerted Action have been used by STECF to estimate the effects of TAC measures on the economic performance of the major European fleets (ref subgroup SGECA of STECF). In the Concerted Action, national experts have defined the most relevant national fishing fleets and provided data for these on economic performance and fleet size. At least in some member states (Denmark, Finland, The Netherlands), only active vessels have been taken into account in the statistics so far, although there are no written guidelines on this. Taking into account the inactive vessels would therefore bias the outcomes for these fleet segments and introduce bias in the bio-economic models used (Anonymous, 2005). This would hold especially for models in which average economic indicators per vessel are used in the modelling process. Also in models which use the total

economic performance of the fleet the bias would implicitly appear, as the proportion between income, variable and fixed cost would change.

Having said this, the question arises whether goal of the DCR is served by including inactive vessels into the Data Collection Programs. The Dutch example shows that it is important to, at least, distinguish between active and inactive vessels and treat inactive vessels as a separate group and that sampling economic information from inactive vessels is highly inefficient. The official vessel register is a sound administrative basis for the data collection, but this register is for administrative purposes and in many countries vessel owners have several different arguments to stay in or out of the register as long as possible. Therefore it may not be the most efficient option to base the economic data collection on the vessel register without additional criteria to distinguish commercial from inactive fishermen. These criteria should of course be (1) simple, (2) transparent and (3) consistent and suitable over the EU member states. The experience from the agricultural data might be of good help here as in agriculture there is also a continuum between commercial farmers and non-commercial farmers. In the agricultural data collection system a farm is defined as a commercial farm if it is large enough to provide a main activity for the farmer and a level of income sufficient to support his/her family (Vrolijk, 2002). Implementing such a criteria in the economic data collection program would be reasonably easy and would enhance the efficiency of the programs and the quality of the outcomes considerably.

The question that remains is whether one should collect complete economic information from the inactive vessels, if these vessels are not taken into account in bio-economic models. This paper shows that for the Dutch case, the main economic indicators can be derived quite easily from available data sources. This information should be enough to have a general idea on the economic potential of the fleet. If this information is not available additional surveys could be done once every few years.

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References

Besluit van 27 augustus 2001, houdende bepalingen omtrent de bemanning van vissersvaartuigen (Besluit zeevisvaartbemanning)

Anonymous, 2005. REPORT OF The Joint SGECA - SGRST sub-group meeting on bio-economic modelling, Ispra 4-6 October 2005

Davidse W.P. et al., 1993. Costs and earnings of fishing fleets in four EC countries, LEI report 110, LEI, (Annex 9 Depreciation and interest calculations for Dutch sample vessels)

Taal, C., Klok, A., Oostenbrugge, J.A.E. van, Smit, M.H., 2005. Visserij in Cijfers 2004, LEI report 05-10. LEI, Den Haag.

Vrolijk, H.C.J. (2002), Working Procedures for the selection of farms in the FADN, in: G. Beers en K. Poppe (eds.), PACIOLI 9; Innovations in the FADN, Report 8.02.02, The Hague, Agricultural Economics Research Institute (LEI).