

Fisheries Centre

The University of British Columbia



Working Paper Series

Working Paper #2015 - 12

Reconstruction of Albania fishery catches by fishing gear

Dimitrios Moutopoulos, Brady Bradshaw
and Daniel Pauly

Year: 2015

Email: dmoutopo@teimes.gr

RECONSTRUCTION OF ALBANIAN FISHERY CATCHES BY FISHING GEAR, 1950 TO 2010

Dimitrios K. Moutopoulos^a, Brady Bradshaw^b and Daniel Pauly^c

- a) Technological Educational Institute of Western Greece,
Department of Aquaculture and Fisheries, Mesolonghi, Greece
- b) Investigative Team, The Black Fish, Amsterdam, The Netherlands. Research Technician, UNC Wilmington
Center for Marine Science, Wilmington, North Carolina, U.S.
- c) *Sea Around Us*, Fisheries Centre, University of British Columbia, Vancouver, Canada

Corresponding author: dmoutopo@teimes.gr

Abstract

A reconstruction of the marine fisheries catch of Albania, from 1950 to 2010 is presented, consisting on the careful evaluation of the official landing statistics reported by Albania to the Food and Agriculture Organization of the U.N. (FAO), complemented by estimates of discards, and differentiating between industrial and small-scale gear. The reconstructed catch estimates were about 1,500 t·year⁻¹ in the early 1950s, peaked at 10,000 t·year⁻¹ in the late 1980s, collapsed to early 1950s levels following the establishment of democracy (1991/1992), and are slowly rebuilding, reaching about 4,000 t in 2010. Some shore based observations on illegal driftnet fishing by Albania-flagged vessels are also provided.

Introduction

Albanian fisheries are mainly marine, but lagoon and especially inland fishing does occur, contributing about 1/3 of total catches (Spaho *et al.* 1997). Albania's Exclusive Economic Zone (Figure 1) includes an extensive easy-to-trawl shelf in the North, and deep waters with a rocky seabed in the South.

Albania's fishing fleet was composed of 378 fishing boats in 2008 (see Table 1), concentrated in four main ports, Durres, Vlora, Shengjini and Saranda, where in approximately 900 people are employed. The fishing fleet consisted mainly of trawlers, with bottom trawlers dominating (Table 1). However, many of these vessels operate only

intermittently and there are many vessels fishing without professional fishing licenses. Brief reviews of what little information is available on Albanian marine fisheries were presented by Spaho et al. (1997), Flloka (2003) and Çobani (2005).



Figure 1: Map of Albania and its Exclusive Economic Zone (EEZ).

We also follow up on some implications of field investigation conducted in southern Italy in the early 2010s, which revealed that many of the ships formerly involved in illegal driftnet activities, and targeting bluefin tuna (*Thunnus thynnus*) and swordfish (*Xiphias gladius*), either appeared to have converted to trawling or longlining, or had been re-flagged, stripped of registration numbers and relocated to several countries outside of the European Union, one being Albania (B. Bradshaw, pers. obs).

Table 1. Albanian fishing vessels in 2008, by type; source: GFCM (2009).

Fishing vessels)	N
Trawlers (<12 m)	5
Trawlers (12-24 m)	144
Trawlers (>24 m)	39
Purse seiners (6-12 m)	12
Purse seiners (>12 m)	11
Artisanal (gill and trammel nets) (<12 m)	6
Artisanal (gill and trammel nets) (<6 m)	147
Artisanal (gill and trammel nets) (6-12 m)	14
Total	378

The section below presents the data sources and method used in our reconstruction of Albanian marine fisheries catches.

Materials and Methods

The time series of reconstructed landings by species (i.e., 64 species or groups of related species, i.e., taxa) and gear (i.e., trawl, mid-water trawl, purse-seine and small-scale vessels) during 1950-2010 using the data derived from the Food and Agriculture Organization of the United Nations (FAO). However, the number of species recorded differed through time; one taxon ('Osteichthyes') from 1950-1982, 8 to 10 taxa from 1983 to 1994, and 25 to 61 taxa from 1995 to 2010.

Following Moutopoulos *et al.* (2015), we calculated the average contribution of the taxa reported in from 1983 to 1994 to the combined landings, and used the resulting mean contributions to split the reported landings of undifferentiated 'Osteichthyes' from 1950 to 1983 (Table 2). The species names were derived from ASFIS List of Species for Fishery Statistics Purposes from FAO database, and verified against FishBase (www.fishbase.org).

Table 2. Ratios computed from the 1983-1994 catch composition, and used to roughly infer the 1950-1982 catch composition (see text).

Species	Ratio
<i>Sardina pilchardus</i> ^a	0.461
<i>Spicara</i> spp.	0.098
<i>Boops boops</i>	0.081
Mugilidae	0.058
<i>Merluccius merluccius</i>	0.040
<i>Mullus</i> spp.	0.032
Rajiformes	0.029
Sparidae	0.015
Atherinidae	0.013
Osteichthyes	0.174

^a See Kapedani (2001).

The disaggregation of the reported total landings into gear-specific landings was done by first computing the mean of the fractional catches by gear for 2001-2010, as derived from Albanian National Statistics Summary (2011; see Table 3). Then, the catch composition of each gear was estimated by using the ratios provided by two different sources (see Appendix Table A1 for industrial gears and A2 for artisanal gear).

Table 3. Fractional landing by gear in Albanian marine fisheries, 2001 to 2010 (Albanian National Statistics Summary 2011).

Gear ratios	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Mean
Bottom trawler	0.75	0.84	0.80	0.91	0.83	0.82	0.74	0.60	0.55	0.59	0.74
Pelagic trawler	0.08	0.04	0.04	0.02	0.03	0.03	0.04	0.19	0.22	0.23	0.09
Purse seiners	0.10	0.08	0.11	0.03	0.03	0.03	0.03	0.01	0.03	0.03	0.05
Coastal hook & line	0.07	0.04	0.05	0.04	0.12	0.12	0.19	0.20	0.20	0.14	0.12

In the absence of data from Albania, discards from Albanian vessels were estimated from discarding rates based on field studies from Aegean waters for the years before 1990s (1950-1966: EVOMED, 2011, 1967-1981: Ananiadis 1968) and from Ionian waters since 1993 (for review see Moutopoulos *et al.* 2015) and were different for each species, both within and among gears. It should be mentioned that reconstruction of discards did not include taxa that are always discarded, which are mainly caught by trawlers (see Table 2 in Machias *et al.*

2001), because these species are not listed in the landing data reported by FAO. Thus, our discard estimates, which only add the discarded fraction to taxa that are landed, are minimal estimates.

Finally, a field investigation, aimed at locating illegal driftnets and formerly blacklisted vessels from Sicily, took place in Albanian ports in late June 2013. Two investigators (incl. the second author) visited seven fishing ports in Albania: Shengjin, Rruga Currila, Durres, Vlorë, Himare, Porto Palermo, and Sarande, and photographed as many vessels as possible, making every effort to include registration number, the name of the ship, and any gear in view.

Results and Discussion

Total catches in Albanian waters increased from just under 1,200 t in 1950 to a peak of 10,700 t in 1987, before declining to just over 4,000 t by 2010 (Figure 2a). They also were, over the entire period, 1.3 times the catch reported by the FAO on behalf of Albania, mainly due to discards having been ignored.

As can also be seen from Figure 2a, this catch was mainly contributed by bottom trawlers, at least in recent decades, while due to the crude nature of our gear disaggregation method, the relative contribution of various in the 1950s to 1970s is highly uncertain. Small-scale fishing contributed 10% of the catch from 1950 to 2010; this small-scale catch was considered to be 95% artisanal and 5% subsistence.

The same uncertainty applies to the taxonomic catch composition (Figure 2b), which was disaggregated using data from 1983 to 1994, and which will be very uncertain outside of this range, particularly in the 1950s to 1970s.

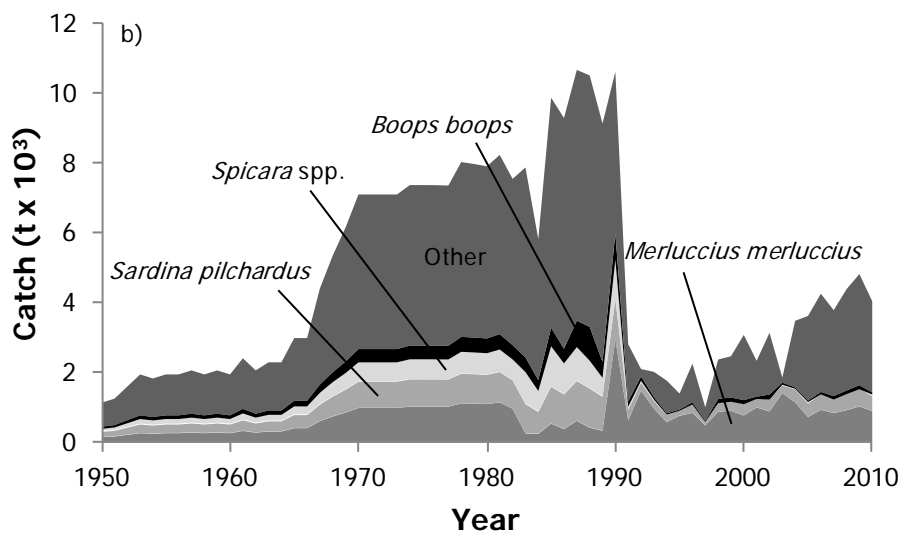
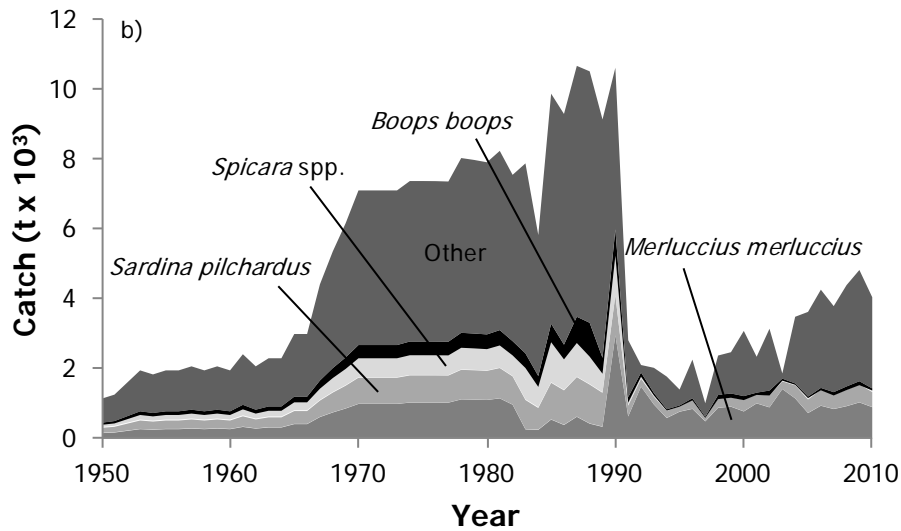


Figure 2. Total reconstructed catch for Albania, 1950-2010, by a) sector, with discards shown separately and data supplied by FAO overlaid as a line graph; and b) by major taxonomic category. ‘Other’ represents 61 additional minor taxonomic groups.

The field investigation conducted in 2013 led to three vessels being identified which appeared to fish with illegal driftnets. One of these was in the port of Shengin, and was equipped with one large driftnet. A conversation with a fisherman on board the ship confirmed that the ship had been targeting swordfish, and that the ship had formerly docked in Sicily. The fisherman also indicated that two other ships had travelled over from Sicily, and

that they were part of the same cooperative there. The second vessel of interest was also in the port of Shengjin, and had been blacklisted several times. However, it was in a state of disrepair, and clearly not in use. The third drift-netting vessel was located in the fishing port of Vlorë. Needless to say, nothing is known of the current catch of these drift-netting vessels, and even less for the 2000s, when their activity was unchallenged and undocumented.

Finally, current sources suggest that Albanian marine recreational fisheries are negligible, incl. GCFM (2010), which omits Albania. Thus, however uncertain, Figures 2a and 2b probably give a reasonable impression of the marine fisheries catches of Albania, which will be straightforward to correct if and when better data become available.

Acknowledgements

D. M. would like to acknowledge the valuable help of Ms. Alma Dhespollari with accessing and translating documents in the Albanian language. BB would like to thank The Waitt Foundation for supporting The Black Fish with a Rapid Ocean Conservation (ROC) grant to enable our investigations in Albania and Tunisia. D.P. acknowledges support from *Sea Around Us*, as scientific collaboration between the University of British Columbia and the Pew Charitable Trusts.

References

- Albanian National Statistics Summary 2011. Ministry of Environment, Forestry and Water Administration, Directorate of Fishing Policies, Albanian Institute of Statistics.
- Ananiadis, K.I., 1968. Greek fisheries. Prospects and perspectives of development. Athens, Centre of National Programme & Economic Research, 281 p.
- Bradshaw, B. and S. van Dorp 2013. Investigative Report: Illegal Driftnets in Albania (June 2013). The Black Fish. Unpublished.
- Çobani, M. 2005. Small-scale fisheries in Albania, p. 13-21 In: Adriatic Sea Small-scale Fisheries. Report of the AdriaMed Technical Consultation on Adriatic Sea Small-Scale Fisheries. Split, Croatia, 14th – 15th October 2003. FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/TD15. AdriaMed Technical Documents, 15.
- European Commission Regulation 2090/98. Concerning the segmentation of the Community fishing fleet and fishing effort in relation to the multiannual guidance programmes. Available from: <http://faolex.fao.org/docs/pdf/eur18320.pdf>
- EVOMED, 2011. The 20th Century evolution of Mediterranean exploited demersal resources under increasing fishing disturbance and environmental change, EVOMED. Open call for tenders n° MARE/2008/11, Proposal for Lot 4, (Contract. N° SI2 539097), 513 p. http://ec.europa.eu/fisheries/documentation/studies/study_evolution_mediterranean/index_en.htm
- Flloko, A. 2003. Overview of the general issues concerning fish markets in the Adriatic Sea: Albania, p. 7-11 In: Aspects of Fish Markets in the Adriatic Sea. Report of the AdriaMed Meeting on Aspects of Fish Markets in the Adriatic Sea, Ancona, Italy 27th - 28th June 2002. AdriaMed Technical Documents. No.10. GCP/RER/010/ITA/TD-10, Termoli, Italy.
- GFCM, 2010. Report of the Transversal Workshop on the Monitoring of Recreational Fisheries in the GFCM Area. Scientific Advisory Committee 13th Session, General Fisheries Commission for the Mediterranean, Palma de Mallorca, Spain, 30 p.
- GFCM 2009. On the establishment of the GFCM regional fleet register. REC.DIR-GFCM/33/2009/5. General Fisheries Commission for the Mediterranean. (<http://www.gfcm.org/gfcm/topic/16103/en>).
- Kapedani, E. 2001. Small pelagic fishery and research in Albania, p. 30-38 In: P. Mannini, F. Massa, N. Milone (eds). Priority topics related to small pelagic fishery resources of the Adriatic Sea. FAO-MiPAF Scientific Cooperation to Support Responsible Fisheries in the Adriatic Sea. GCP/RER/010/ITA/TD-03. AdriaMed Technical Documents 3.
- Machias A, Vassilopoulou V, Vatsos D, Bekas P, Kallianiotis A, Papaconstantinou C and Tsimenides N. 2001. Bottom trawl discards in the northeastern Mediterranean Sea. Fisheries Research 53: 181-195.
- Moutopoulos, D.K., A.C. Tsikliras and K.I. Stergiou. 2015. Reconstruction of Greek fishery catches by fishing gear and area (1950-2010). Fisheries Centre Working Paper #2015-11, University of British Columbia, Vancouver, 14 p.
- Spaho, V., A. Flloko and S. Selfo. 1997. Albanie, une agriculture en transition Options Méditerranéennes, Sér, B (15) : 143-154.

Appendix Table A1. Species composition per gear for industrial fisheries in Albanian waters. Sources: Albanian National Statistics Summary (2011, in Albanian); AdriaMed (2006).

Gear	Albania	AdriaMed
Purse seiners	Percent	Percent
<i>Sardina pilchardus</i>	83.00	95.60
<i>Engraulis encrasicolus</i>	5.67	
<i>Scomber japonicus</i>	5.67	1.60
<i>Trachurus trachurus</i>	5.67	
<i>Sarda sarda</i>		2.10
<i>Loligo</i> spp.		0.70
Mid-water trawler	Percent	
<i>Sardina pilchardus</i>	90	
<i>Xiphias gladius</i>	4	
<i>Scomber japonicus</i>	2	
<i>Loligo vulgaris</i>	2	
Mugilidae	2	
Bottom trawlers		Percent
<i>Merluccius merluccius</i>		28.0
<i>Parapenaeus longirostris</i>		17.4
<i>Mullus barbatus</i>		8.9
<i>Octopus vulgaris</i>		5.6
<i>Boops boops</i>		4.3
<i>Loligo</i> spp.		4.1
<i>Sepia officinalis</i>		3.7
<i>Trachurus trachurus</i>		2.7
<i>Octopus</i> spp		2.6
<i>Spicara</i> spp		2.5
Other		20.1

Appendix Table A2. Species composition per gear for artisanal fisheries in Albanian waters. Source: AdriaMed (2006).

Gear	AdriaMed
Gill nets	Percent
<i>Merluccius merluccius</i>	26.7
<i>Spicara</i> spp.	25.0
<i>Trachurus trachurus</i>	15.4
<i>Boops boops</i>	9.6
<i>Trigloporus lastoviza</i>	3.7
<i>Solea vulgaris</i>	2.6
<i>Sarda sarda</i>	2.1
<i>Sardinella aurita</i>	1.9
<i>Loligo</i> spp.	1.3
Others	11.6
Hook and lines	Percent
<i>Epinephelus</i> spp.	19.4
<i>Mustelus mustelus</i>	14.4
<i>Sepia ocellatus</i>	11.9
<i>Dentex dentex</i>	11.6
<i>Sarda sarda</i>	7.3
<i>Solea vulgaris</i>	7
<i>Sardinella aurita</i>	6.3
<i>Conger conger</i>	5.9
<i>Octopus vulgaris</i>	3.3
<i>Mantis aquila</i>	2.8
Others	10.1
Other small scale gear	Percent*
<i>Merluccius merluccius</i>	0.255
<i>Spicara</i> spp	0.238
<i>Trachurus trachurus</i>	0.147
<i>Boops boops</i>	0.092
<i>Trigloporus lastoviza</i>	0.035
<i>Solea vulgaris</i>	0.028
<i>Sarda sarda</i>	0.023
<i>Sardinella aurita</i>	0.021
<i>Loligo</i> spp	0.012
<i>Epinephelus</i> spp	0.009
<i>Mustelus mustelus</i>	0.007
<i>Sepia ocellatus</i>	0.005
<i>Dentex dentex</i>	0.005
<i>Conger conger</i>	0.003
<i>Octopus vulgaris</i>	0.002
<i>Mantis aquila</i>	0.001
Others	0.116

Appendix Table A3. FAO landings vs. total reconstructed catch for Albania, 1950-2010, including catch by sector with discards shown separately.

Year	FAO landings	Total reconstructed catch	Industrial	Artisanal	Discards
1950	1,000	1,160	880	117	156
1951	1,100	1,270	970	129	171
1952	1,400	1,620	1,240	164	218
1953	1,700	1,960	1,500	199	265
1954	1,600	1,850	1,410	188	249
1955	1,700	1,960	1,500	199	265
1956	1,700	1,960	1,500	199	265
1957	1,800	2,080	1,590	211	280
1958	1,700	1,960	1,500	199	265
1959	1,800	2,080	1,590	211	280
1960	1,700	1,960	1,500	199	265
1961	2,100	2,430	1,850	246	327
1962	1,800	2,080	1,590	211	280
1963	2,000	2,310	1,770	235	312
1964	2,000	2,310	1,770	235	312
1965	2,600	3,010	2,290	305	405
1966	2,600	3,010	2,290	305	405
1967	3,300	4,430	2,910	387	1,128
1968	4,000	5,370	3,530	469	1,367
1969	4,600	6,170	4,060	540	1,572
1970	5,300	7,110	4,680	622	1,811
1971	5,300	7,110	4,680	622	1,811
1972	5,300	7,110	4,680	622	1,811
1973	5,300	7,110	4,680	622	1,811
1974	5,500	7,380	4,850	645	1,879
1975	5,500	7,380	4,850	645	1,879
1976	5,498	7,380	4,850	645	1,879
1977	5,490	7,370	4,850	644	1,876
1978	5,990	8,040	5,290	703	2,047
1979	5,950	7,980	5,250	698	2,033
1980	5,900	7,920	5,210	692	2,016
1981	6,143	8,240	5,420	721	2,099
1982	5,720	7,560	5,050	671	1,837
1983	5,908	7,880	5,210	693	1,976
1984	4,377	5,840	3,860	514	1,458
1985	7,419	9,880	6,550	870	2,459
1986	6,973	9,300	6,150	818	2,325
1987	8,020	10,670	7,080	941	2,652
1988	7,891	10,520	6,970	926	2,626
1989	6,851	9,140	6,050	804	2,289
1990	8,177	10,620	7,220	959	2,442
1991	2,162	2,830	1,910	254	667
1992	1,704	2,120	1,500	200	415
1993	1,600	2,040	1,410	188	439
1994	1,380	1,790	1,220	162	408
1995	1,127	1,420	990	132	290
1996	1,768	2,270	1,560	207	505
1997	809	1,020	710	95	216
1998	1,860	2,390	1,640	218	530
1999	1,933	2,480	1,710	227	552
2000	2,372	3,090	2,090	278	722
2001	1,839	2,360	1,620	216	516
2002	2,436	3,160	2,150	286	720
2003	1,535	1,880	1,350	180	342
2004	2,705	3,500	2,390	317	793
2005	2,769	3,640	2,440	325	869
2006	3,261	4,270	2,880	383	1,012
2007	2,903	3,800	2,560	341	899
2008	3,357	4,400	2,960	394	1,046
2009	3,690	4,840	3,260	433	1,146
2010	3,097	4,060	2,730	363	960

Appendix Table A4. Total reconstructed catch for Albania, 1950-2010, by major species. 'Other' represents 61 additional taxonomic groups.

Year	<i>Merluccius merluccius</i>	<i>Sardina pilchardus</i>	<i>Spicara</i> spp	<i>Boops boops</i>	Other
1950	159	140	103	63	690
1951	175	154	113	69	760
1952	223	196	144	88	970
1953	271	238	175	107	1,170
1954	255	224	165	101	1,100
1955	271	238	175	107	1,170
1956	271	238	175	107	1,170
1957	287	252	185	114	1,240
1958	271	238	175	107	1,170
1959	287	252	185	114	1,240
1960	271	238	175	107	1,170
1961	335	294	216	133	1,450
1962	287	252	185	114	1,240
1963	319	280	206	126	1,380
1964	319	280	206	126	1,380
1965	414	365	268	164	1,790
1966	414	365	268	164	1,790
1967	615	463	360	236	2,750
1968	745	561	436	287	3,340
1969	857	645	502	330	3,840
1970	987	743	578	380	4,420
1971	987	743	578	380	4,420
1972	987	743	578	380	4,420
1973	987	743	578	380	4,420
1974	1,024	771	600	394	4,590
1975	1,024	771	600	394	4,590
1976	1,024	771	600	394	4,590
1977	1,023	770	599	393	4,580
1978	1,116	840	653	429	5,000
1979	1,108	834	649	426	4,970
1980	1,099	827	643	423	4,920
1981	1,144	861	670	440	5,130
1982	966	802	623	409	4,760
1983	264	830	936	420	5,430
1984	251	615	622	312	4,030
1985	543	1,042	1,184	530	6,580
1986	390	980	908	422	6,600
1987	622	1,125	998	753	7,170
1988	427	1,107	821	970	7,190
1989	337	961	568	456	6,820
1990	2,940	1,145	1,158	755	4,620
1991	631	302	104	160	1,630
1992	1,480	221	79	122	220
1993	971	215	57	73	720
1994	587	191	30	42	940
1995	766	158	0	36	460
1996	846	246	9	64	1,110
1997	492	111	0	36	390
1998	877	256	5	120	1,130
1999	908	265	5	124	1,180
2000	773	328	8	117	1,870
2001	1,002	254	4	66	1,030
2002	889	336	16	146	1,770
2003	1,409	215	43	59	150
2004	1,144	369	37	40	1,910
2005	727	380	61	44	2,430
2006	935	451	6	69	2,810
2007	841	400	3	96	2,460
2008	922	461	14	106	2,900
2009	1,030	508	0	114	3,180
2010	895	424	66	60	2,610