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Abstract

Fisheries removals from Gabon were reconstructed to include small-scale artisanal, subsistence catches and foreign industrial catches. Total removals from the Gabonese EEZ were estimated at less than 5,000 t in 1950, constituted mostly of small-scale catches, increased gradually to a peak of 242,000 t in 2000 and then decreased to 161,000 t in 2010. Domestic fisheries catches of Gabon were estimated to be 2.5 times the data reported by the FAO on behalf of Gabon; however, under-reporting decreased in the last few years, suggesting improvements in fisheries catch statistics. Artisanal fisheries represented 73% of total domestic removals from the Gabonese EEZ, which highlights the importance of small-scale fisheries to the local economy and domestic food security.

Introduction

Gabon (Figure 1), a country on the equator, is located in Sub-Saharan West Africa and is bordered by the Congo from the east and south, Cameroon and Equatorial Guinea from the north and the Atlantic Ocean from the west.

Figure 1. Map of Gabon with Exclusive Economic Zone (EEZ).

Gabon obtained independence from France in 1960, and has been considered one of the most prosperous economies of West Africa, thanks to a number of factors including low population, forest resources and abundant oil resources. The economy of Gabon relies mostly on extractive activities, notably timber, manganese, uranium and oil. After the 1973-1974 spike in oil prices, the dependence of Gabon on the oil industry grew strongly, which almost made it the wealthiest country of Africa. However, the sharp decline in oil prices in 1986 resulted in a decline in the GDP by 43% between 1985 and 1987, threatening the local economy, despite Gabon having the highest human development index of Africa. This led the Gabonese government to diversify the economy and invest in other extractive sectors such as fisheries (Ijiff 1991).

As reported by the government, fisheries in Gabon include two main sectors. One is the industrial sector operated mainly by foreign vessels and joint ventures, including reflagged vessels often referred to as "domestic" but essentially remaining mainly under foreign beneficial ownership (Ekouala 2013). The other is the artisanal sector, which is operated mainly by migrant fishers, a distinguishing feature of Gabonese fisheries (Haakonson 1992). Artisanal fisheries in Gabon are the main source of domestic fish landings, and are characterized by the "weakness of its production tool and the supremacy of migrant fishermen" (Bignouma 2011). The informal nature of this sectors makes it difficult to monitor in terms of fisheries statistics (Bignouma 2011).

Total biomass estimates show an increase over time (Kebe *et al.* 1996); in contrast, catches show a decline. With over-exploitation being considered an issue, this does question the quality of data that are available officially. Furthermore, up to the mid-1990s, only 35% of the industrial fleet landed their catches in Libreville (Gabon); thus, official industrial statistics only account for that part of industrial catch that is landed in Libreville, and the remaining vessels' effort and catch data are unknown (Kebe *et al.* 1996). Moreover, non-commercial subsistence fisheries are not included in official statistics, and neither are discards and illegal fisheries.

Catch data have to be improved in order to better grasp the impacts of investments in fisheries (Kebe 2011). Therefore, the purpose of this report is to provide an alternative and comprehensive estimate for catches from the Gabonese Exclusive Economic Zone (EEZ) from 1950 to 2010, using the 'reconstruction' method developed by Zeller *et al.* (2007).

Methods

Total and coastal population of Gabon

Total population data were extracted from www.populstat.info (2014) for the period from 1950 and 1959 and from the World Bank database (www.worldbank.org) for 1960 and 2010. Coastal rural and urban population living within a range of 5 km from the coast was extracted from CIESIN (2012) for 1990, 2000 and 2010, then expressed as a percentage of total population, i.e., 33% for 1990, 43% for 2000 and 30% for 2010. We assumed coastal population represented 33% of the total population in 1950 and thus estimated coastal population for the same year at around 153,000 persons (Figure 2).

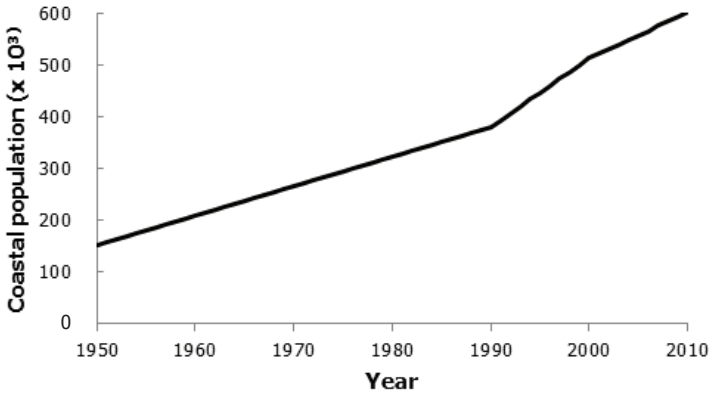

Figure 2. Coastal population of Gabon, 1950-2010.

Subsistence catches

A household survey conducted in the early 1960s estimated fish consumption from non-commercial activities (subsistence fishing) at 23.5 g·person^{-1}·day^{-1}, i.e. 8.6 kg·person^{-1} for 1963. This estimate was multiplied by the estimated coastal population, resulting in estimated subsistence catches of 1,944 t for 1963. Total subsistence catches were assumed to be 30% higher in 1950 compared to 1963. A more recent household survey estimated fish consumption per adult male equivalent (AME) at 200 g·AME^{-1}·day^{-1} from commercial small-scale and non-commercial sources (Wilkie *et al.* 2005), i.e., 150 g·person^{-1}·day^{-1} (1 AME is equivalent to 0.75 person) and 55 kg·person^{-1}·year^{-1}. The latter estimate was multiplied by the coastal population, then artisanal catches (estimated below) were subtracted, and the remainder treated as subsistence catches. Imports and exports extracted from the United Nations Food and Agriculture database for 2005 were also used to balance internal consumption. The same operation was performed for 2010, assuming the same consumption rate. We interpolated linearly to complete the estimates.

Artisanal catches

The number of artisanal canoes was provided by different sources for 1967, 1974, 1983, 1990, 1996, 2008, 2009, 2010 (Table 1). Given the evidence of a lower effort in the early 1950s (Lagoin and Salmon 1970), it was assumed that the number of canoes in 1950 was half of that of 1967; intermediate values were interpolated (Table 1). The catch per unit of effort (CPUE) was averaged at 294 kg·canoe^{-1}·day^{-1} from Kebe *et al.* (1996) for 1995 and at 55.1 kg·canoe^{-1}·day^{-1} from Badjina Egombengani (2011) between 2008 and 2010. Fishers noted a strong decrease in daily CPUE between the mid-1960s and the 1990s (Ijiff 1991); therefore, the CPUE in 1965 was set 20% higher than the CPUE in 1995. Similarly, given lower rates of motorization, and relatively smaller boats in the 1950s compared to later time periods, when migrant fishers introduced bigger boats, the CPUE in 1950 was set 50% lower than the CPUE in 1965, and intermediate values were interpolated (Table 1). The number of fishing days for 1000 canoes were estimated at 99,744 days for 1995 and for 1,600 canoes at 157,510 days for 1999 (Ekouala 2013), i.e. 99 fishing days·canoe^{-1}·year^{-1} between 1995 and 1999. The number of fishing days per canoe for 2010 was obtained by dividing the 26,710 fishing days by the 176 canoes estimated as fishing in 2010 (Badjina Egombengani 2011). The latter was obtained by dividing the number of fishers (230 fishers) by the average number of fishers per canoe (1.3 fishers·canoe^{-1}) estimated from the total number of fishers and the total number of canoes surveyed by Badjina Egombengani (2011). The pattern of increasing number of fishing days suggests declining resources (Ijiff 1991); thus, this pattern was projected backward, i.e., the number of fishing days in 1950 was assumed to have been 40% lower than in 1995, i.e. 40 days·canoe^{-1}·year^{-1}. The days fished were then interpolated to fill in the gaps. Total artisanal catches were then obtained as the product of the number of canoes, the CPUE and the number of fishing days.

Table 1. Number of artisanal fishing canoes and corresponding CPUE in Gabon, 1950-2010. Values in italics are interpolated.

Year	Canoes	Source	CPUE	Source
1950	275	Assumption	176.0	Assumption
1965	518	Interpolation	353.0	Assumption
1967	550	Lagoin and Salmon (1970)	349.0	Interpolation
1974	600	Everett (1976)	335.0	Interpolation
1983	1,800	Haakonson (1992)	318.0	Interpolation
1990	1,110	Ijiff (1991)	304.0	Interpolation
1995	1,435	Interpolation	294.0	Kebe *et al.* (1996)
1996	1,500	Kebe *et al.* (1996)	276.0	Interpolation
2008	2,824	Kebe (2011)	55.1	Badjina Egombengani (2011)
2009	3,000	Kebe (2011)	55.1	Badjina Egombengani (2011)
2010	3,000	Assumed constant	55.1	Badjina Egombengani (2011)

Industrial catches

Domestic catches

The domestic industrial fishing fleet in Gabon includes vessels of foreign origin and majority foreign beneficial ownership, mainly from China. We first reconstructed total 'domestic' industrial catches, then allocated the catch to 'real domestic' and joint venture fleets. The first industrial trawler operated in Gabon in 1948, and it persisted into the 1950s (Haakonson 1992). Catches were low due to the experimental nature of the fishery, with about 60 t for 1956 and 101 t for 1957 (Haakonson 1992). It was assumed that catches were constant between 1950 and 1956. The number of boats was reported at 5 trawlers for 1967 (Lagoin and Salmon 1970) and 10 trawlers for 1974 (Everett 1976). The number of 'domestic' vessels was compiled by Ekouala (2013) for the period between 1979 and 2007, during which (in 1985) China entered the fishery through a joint venture with Gabon. The number of boats for the later years was provided by the Department of Fisheries and Aquaculture for 2008, 2009, 2010, showing both domestic and foreign vessels by name, flag, gear type, number of months fishing, and licence fees paid by each vessel (Anon. 2009, 2010, 2011). Kebe *et al.* (1996) reported a shrimp trawl CPUE of 300 kg·boat^{-1}·day^{-1}, while Ekouala (2013) estimated that catches were, in reality, 5 to 10 times higher than reported landings per boat, i.e. 7.5 times higher, as trawlers usually report only target species. Thus, the shrimp trawler total CPUE was estimated at 2,250 kg·boat^{-1}·day^{-1} (or 720 t·boat^{-1}·year^{-1}), assuming 320 fishing days per year for 1996 (based on the duration of fishing licences). Similarly, Kebe *et al.* (1996) reported 1,600 kg·boat^{-1}·day^{-1} for demersal trawlers. As shrimp trawlers are known to generate higher by-catch amounts, we assumed under-reporting was 50% lower for demersal trawlers. Therefore, the demersal trawler CPUE is estimated to be 3.25 times higher than the reported CPUE, i.e., 1,872 t·boat^{-1} for 1996. This yielded an average CPUE estimate of 1,296 t for 1996. It was assumed that the CPUE would have been 50% higher in 1950 and 10% lower in 2010; an interpolation was then performed to fill in the gaps, which the resulting trend corresponding to the drastic decline in CPUE documented since the 1960s (Ekouala 2013). The 'domestic' industrial catches from 1967 to 2010 were obtained by multiplying the number of 'domestic' industrial vessels by the estimated CPUE, then interpolating to the 1950, 1956 and 1957 catch estimates to complete the time series. To filter out 'real' domestic from joint venture catches, it was assumed that the officially reported industrial catch was that of vessels landing catches at ports of Gabon (Haakonson 1992; Kebe 2011; Ekouala 2013; Barretta and Houston 2014). Although, a few of these vessels might have been of Chinese origin as well, it is more likely that under-reporting is due to Chinese vessels landing their catch elsewhere rather than vessels based and landing in Gabon ports.

Foreign legal catches

The number of foreign fishing vessels, i.e., vessels that are flagged to and have majority beneficial ownership in countries other than Gabon, was gathered from different sources for 1965, 1974, 1979 and between 1991 and 2010 (Kebe *et al.* 1996; Anon. 2009, 2010, 2011; Ekouala 2013). Interpolations were performed back to 1965, which was deemed the start date of foreign fishing in Gabon waters. The foreign fishing effort was multiplied by the previously estimated CPUE (see above). Under-reporting by foreign vessels is likely higher as vessels are generally based in foreign ports, and their catch and effort data are not recorded by Gabon (Kebe *et al.* 1996). There are over twenty foreign countries operating under different types of access agreements in Gabon, flying a range of flags (real nationality in brackets): Angola, Belize (China), Belize (France), Belize (Spain), Cape Verde (China), Cameroon (China for bottom trawlers), China, Congo (China), France, Korea, Ghana, Guatemala, Guinea (China), Indonesia, Japan, Madagascar, Namibia, Netherlands Antilles (unknown), Nigeria (China), Philippines, Sao Tome and Principe, Togo (Spain), Spain, Portugal, and Panama (Korea) (Anon. 2009, 2010, 2011; Mallory 2013). The number of vessels per fishing entity was reported for the period between 2007 and 2010 (Anon. 2009, 2010, 2011). It was assumed that vessels flagged to African countries (except those with a Chinese origin) and those that are European but flagged to other countries such as Belize and Korea, started fishing when the foreign fishery began, given their documented presence in neighbouring countries. Japan started fishing in the early 1980s (Belhabib In press); EU countries under the EU-Gabon fishing agreement started fishing at the beginning of the first agreement in 1998; China started fishing in Gabon in 1985 (Kebe 2011); Chinese vessels flying the Congolese flag started operating in Gabon in the early 2000s when China started reflagging to Congo (Belhabib and Pauly In press-b); vessels from the remaining countries, mainly flag-of-convenience countries were assumed to have begun fishing in Gabon in 2000. We converted the number of vessels per country to percentages between 2007 and 2010, then we carried these percentages backwards to 2000 for all countries which began fishing in 2000, and to 1998 for fleets operating under the EU-Gabon agreement. For the remaining time period, we allocated catches evenly between countries documented within a similar time range.

Foreign illegal catches

Illegal fishing is widespread, but only partly controlled in Gabon. When foreign vessels are incriminated, foreign pressure is usually applied on local officials, such as to assist the foreign crew (Ekouala 2013). In 2010, six trawlers were caught fishing illegally during 17 days of patrol (Ekouala 2013). This number was extrapolated to the entire year, which led to an estimate of 21 vessels fishing illegally, which, when multiplied by the above-estimated CPUE, gives an estimate of 25,000 t·year^{-1} of illegal catch. For 2005, illegal catches were equivalent to 19% of the total legal catch (MRAG 2005). Thus, this estimate was multiplied by the reconstructed total catch by legal foreign fleets, which yielded an illegal catch of 14,356 t·year^{-1}. We assumed illegal fishing, mainly by Chinese operators, began when Chinese fleets started operating in Gabon waters, i.e., in 1985, and interpolated.

Discards

The data submitted by fishing vessels to the Department of Fisheries showed an average discard rate of 2% (Anon. 2009), which was applied across all trawl fleets between 1950 and 2010. This is likely an underestimate. For tuna vessels, i.e., those operating under the flag of Guatemala, Belize, Ghana, EU countries, Japan, Netherlands, Antilles and Cape Verde, discard rates from Romagny *et al.* (2000), and Chavance *et al.* (2011) summarized in Belhabib and Pauly (In press-a) were applied to the tuna catches by these vessels.

Species disaggregation

To disaggregate subsistence and artisanal catches, the species composition for 2000s (Badjina Egombengani 2011) and 1967 (Lagoin and Salmon 1970) were interpolated for each species/taxon. The catch composition was assumed constant between 1950 and 1967. Trawl catch composition between 2005 and 2009 was available from the Department of Fisheries reports (Anon. 2009) and for 1967 by Lagoin and Salmon (1970). For the tuna catch disaggregation, catch descriptions by Failler *et al.* (2013) and Anon. (2004) were used, from which discarded tuna by-catch composition was extracted.

RESULTS

Subsistence catches

Subsistence catches decreased slightly from 2,500 t in 1950 to around 2,000 t in 1963, then increased to a peak of over 8,200 t in 2005, before decreasing again, to less than 4,000 t in 2010 (Figure 3).

Artisanal catches

Artisanal fisheries catches witnessed changes over time as they increased slowly from 2,000 t in 1950 to 56,500 t in 1983 (due to the increase in fishing effort), then decreased to around 37,000 t in 1990 (Figure 4). Catches increased to a second peak of 60,000 t in 2004, before decreasing rapidly to around 28,400 t in 2010, mainly driven by over-exploitation.

Industrial catches

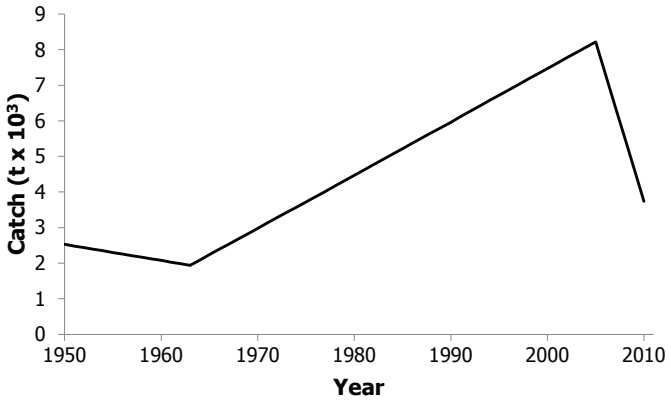

Figure 3. Reconstructed subsistence catches in Gabon, 1950-2010.

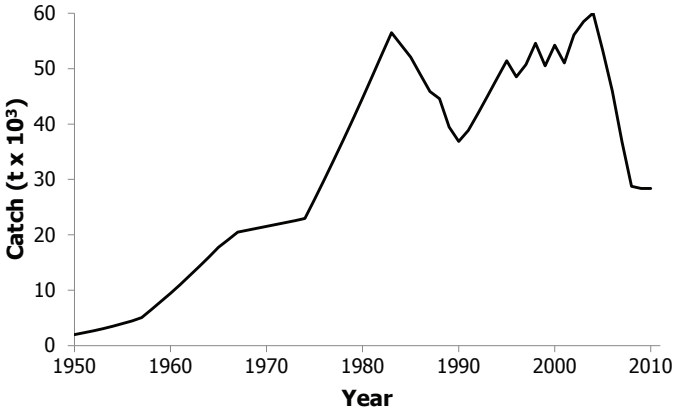

Figure 4. Reconstructed artisanal catches in Gabon, 1950-2010.

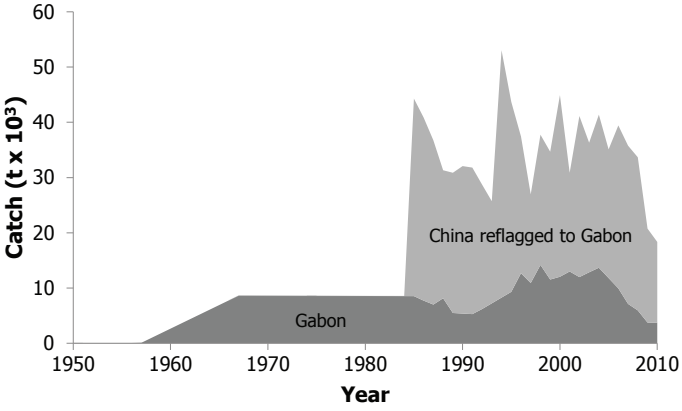

Figure 5. Reconstructed industrial 'domestic' catches including those by vessels of Chinese origin in Gabon, 1950-2010.

Industrial 'domestic' catches (i.e., 'Gabon' in Figure 5) increased from 60 t in 1950 to about 8,600 t in 1967, and remained around that level until 1984, when China entered the fishery under Gabon's flag (Figure 5). Overall 'domestic' catches, Gabon and China reflagged to Gabon, increased rapidly to a first peak of 44,300 t in 1985, and a second peak of 53,000 t in 1994 (Figure 5), the latter due to the increase in the number of fishing vessels. Catches declined thereafter to approximately 18,000 t in 2010, of which 14,600 t were taken by Chinese vessels reflagged to Gabon (Figure 5).

Foreign industrial catches (excluding China flagged as 'Gabon') increased from 9,000 t in 1965, when foreign fishing was deemed to have started, to around 74,000 t in 1979, after which they remained relatively constant until the early 1990s (Figure 6). Industrial foreign catches varied later-on due to changes in the number of legal foreign fishing vessels, and peaked at 104,000 t in 2000 and 101,000 t in 2008, before decreasing to 71,000 t in 2010. Foreign legal fisheries were dominated by trawl catches prior to the mid-2000s and by tuna catches thereafter (Figure 6). Illegal foreign catches increased from less than 1,000 t in 1986 to over 23,000 t in 2010 (Figure 6).

African countries catches represented the bulk of catches with around 47% of foreign catches from the Gabonese EEZ, while EU countries represented less than 20% and China slightly over 20%. However, the contributions of China and the EU to total foreign catches has increased over time.

Discards

Discards increased from around 550 t·year^{-1} in the late 1960s to around 5,000 t·year^{-1} between the early 1980s and the mid-1990s, before increasing to a first peak of 10,000 t in 2000, and then a second peak of 13,000 t in 2008 (Figure 7).

Total catches

Total domestic catches, including artisanal, industrial, and subsistence catches, as well as discards were estimated at around 4,600 t in 1950 compared to 2,400 t reported to the FAO, increased to a peak of 63,000 t in 1994 compared to 26,500 t reported to the FAO, and then decreased to less than 36,000 t in 2010 compared to 22,000 t reported to the FAO (Figure 8a). Overall, total catches were 2.5 times the data supplied to the FAO. However, under-reporting was at its maximum during the first years of industrial fisheries, and underreporting has declined considerably in the most recent time period (Figure 8a).

Taxonomically, domestic catches included around 70 groups. However, the bulk of the catch consisted of bonga shad (*Ethmalosa fimbriata*) and West African croakers (*Pseudotolithus* spp.) (Figure 8b).

Total foreign catches (legal, illegal and discards) were estimated at around 9,000 t in 1965, increased to a peak of 120,000 t in 1994 and a second peak of 176,000 t in 2008, before decreasing to 126,000 t in 2010 (Figure 10).

Discussion

Total removals from the Gabonese EEZ were estimated at less than 5,000 t·year^{-1} in the early 1950s, consisting mostly of small-scale catches, increased gradually to a peak of 243,000 t in 2000 and then decreased to 162,000 t in 2010. Small-scale fisheries accounted, on average, for 60% of the total legal catch. This highlights the importance of small-scale fisheries to the population of Gabon, which remains the second most practiced activity in rural areas (Badjina Egombengani 2011). Although domestic catches were strongly under-reported, the decrease of the under-reported component indicates an improvement in official catch statistics since the early 2000s (see also Badjina Egombengani 2011).

Illegal catches were estimated to have been the equivalent of 1% of legal catches in the past, and around 50% today, indicating an alarming increase in less than 25 years, which may partially explain the problem of over-exploitation in the waters of Gabon. Furthermore, of the around 80 taxa caught by the legal fisheries of Gabon, 40 taxa are also taken by illegal fisheries, indicating an overlap of 50% in taxa targeted or caught. Economically, illegal fisheries are estimated to have extracted over $207 million US in 2010 from the waters of Gabon that could have been extracted by legal fisheries, assuming a price of $8.3 US·kg^{-1} (RFI 2012). Thus, the net loss to the total Gabonese economy, if we could assume complete landings and processing within Gabo, using an economic multiplier of 2.95 (Dyck and Sumaila 2010), would be equivalent to $610 million US per year. The legal fisheries contribute $1.3 billion

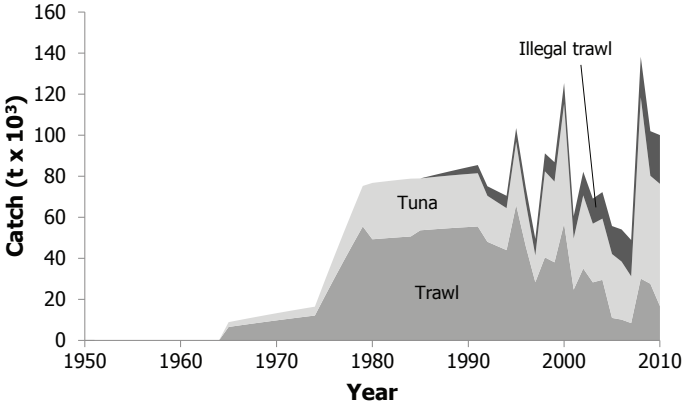

Figure 6. Reconstructed industrial discards from Gabon by gear, 1950-2010.

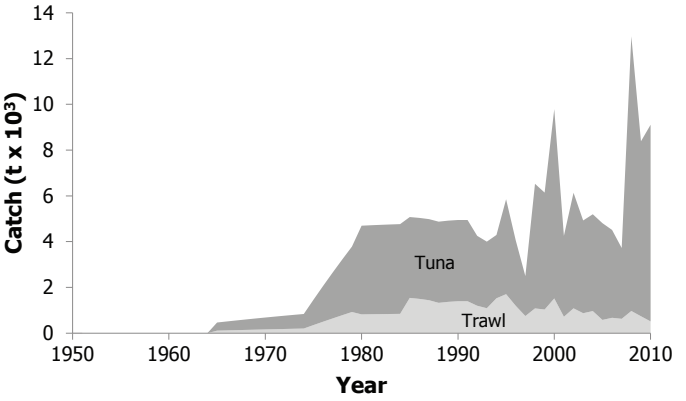

Figure 7. Reconstructed total foreign catches from Gabon, 1950-2010.

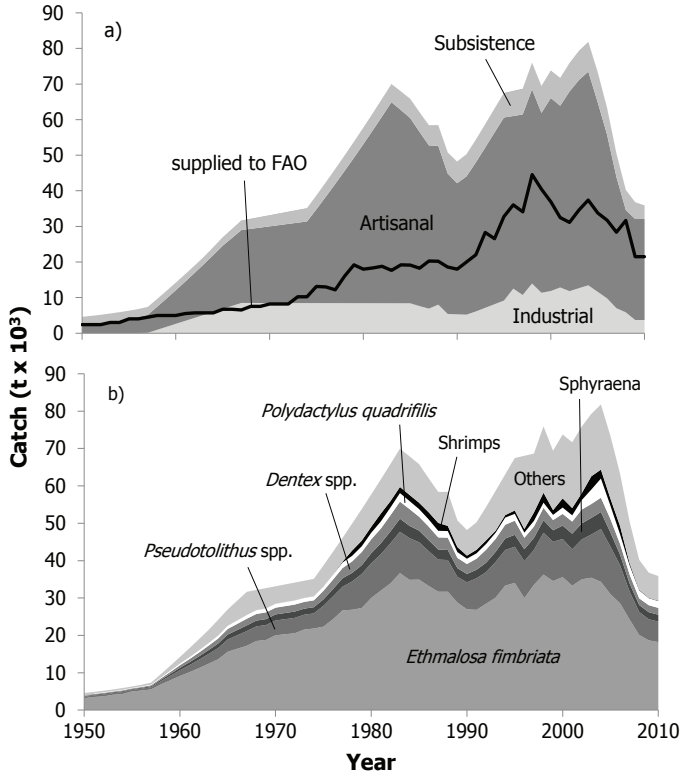

Figure 8. Reconstructed total domestic catches a) by sector from Gabon, 1950-2010, with solid line as data supplied to FAO. Discards plotted but cannot be seen on graph; b) by taxonomic composition from Gabon, 1950-2010.

US to the Gabonese economy, i.e., around 9% of the Gabonese GDP in 2010, while small-scale fisheries alone contribute $800 million US of the total economy, i.e., 5% of the GDP, a clear indication of their importance to both the economy and food security.

Small-scale fisheries in Gabon, the main source of animal protein, are threatened by increasing illegal fishing, combined with a low monitoring, control and surveillance capacity (Barretta and Houston 2014) and other threats, such as increasing migrations towards the coast. Although fisheries statistics have improved over time, there is still room for effort to refine the catch statistics, notably through a separate accounting of small-scale and industrial fisheries. Most important, however, is the enforcement of fisheries legislations, notably against foreign vessel incursions.

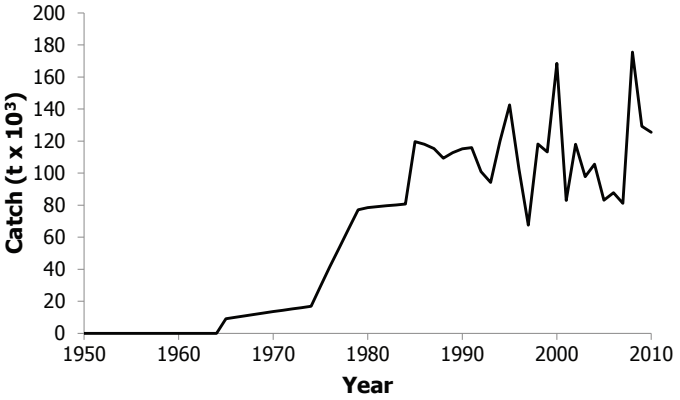

Figure 9. Reconstructed total foreign catches from Gabon, 1950-2010.

Acknowledgements

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Appendix Table A1. FAO landings vs. reconstructed total catch (in tonnes), and catch by sector, with discards shown separately for Gabon, 1950-2010.

Year	FAO landings	Reconstructed total catch	Industrial	Artisanal	Subsistence	Discards
1950	2,400	4,580	60	2,000	2,530	1
1951	2,400	4,860	60	2,320	2,480	1
1952	2,400	5,170	60	2,670	2,440	1
1953	3,000	5,520	60	3,070	2,390	1
1954	3,000	5,900	60	3,490	2,350	1
1955	4,000	6,320	60	3,960	2,300	1
1956	4,000	6,780	60	4,460	2,260	1
1957	4,500	7,360	101	5,040	2,210	2
1958	5,000	9,590	940	6,470	2,170	16
1959	5,000	11,870	1,780	7,940	2,120	30
1960	5,000	14,190	2,620	9,450	2,080	44
1961	5,500	16,560	3,459	11,010	2,030	59
1962	5,700	18,980	4,299	12,620	1,990	73
1963	5,700	21,450	5,138	14,280	1,940	87
1964	5,700	24,160	5,978	15,990	2,090	101
1965	6,700	26,920	6,817	17,750	2,240	115
1966	6,700	29,290	7,656	19,110	2,390	130
1967	6,500	31,660	8,496	20,490	2,530	144
1968	7,500	32,150	8,491	20,830	2,680	144
1969	7,500	32,640	8,485	21,180	2,830	144
1970	8,200	33,130	8,480	21,530	2,980	144
1971	8,200	33,630	8,475	21,880	3,130	143
1972	8,200	34,120	8,469	22,230	3,280	143
1973	10,200	34,620	8,464	22,580	3,430	143
1974	10,200	35,120	8,459	22,940	3,570	143
1975	13,100	38,690	8,453	26,370	3,720	143
1976	13,020	42,350	8,448	29,890	3,870	143
1977	12,210	46,090	8,443	33,480	4,020	143
1978	16,000	49,890	8,437	37,140	4,170	143
1979	19,200	53,760	8,432	40,860	4,320	143
1980	18,000	57,710	8,427	44,670	4,470	143
1981	18,346	61,730	8,421	48,550	4,620	143
1982	18,805	65,810	8,416	52,490	4,770	142
1983	17,649	69,960	8,411	56,490	4,920	142
1984	19,200	67,910	8,405	54,300	5,070	142
1985	19,153	65,800	8,400	52,050	5,220	142
1986	18,244	62,030	7,600	48,940	5,370	129
1987	20,286	58,390	6,900	45,860	5,520	117
1988	20,191	58,400	8,022	44,580	5,670	136
1989	18,601	50,770	5,400	39,460	5,810	91
1990	18,000	48,190	5,300	36,840	5,960	90
1991	20,000	50,240	5,200	38,840	6,120	88
1992	22,000	54,340	6,100	41,880	6,270	103
1993	28,290	58,680	7,120	45,030	6,420	120
1994	26,515	63,100	8,140	48,250	6,570	138
1995	32,777	67,460	9,159	51,430	6,720	155
1996	36,045	68,060	12,518	48,500	6,870	172
1997	34,073	68,640	10,738	50,710	7,020	177
1998	44,556	75,920	13,949	54,570	7,170	236
1999	40,453	69,400	11,353	50,530	7,320	193
2000	36,937	73,740	11,849	54,230	7,470	199
2001	32,482	71,670	12,844	51,050	7,620	160
2002	31,136	75,880	11,804	56,120	7,770	186
2003	34,576	79,270	12,648	58,490	7,920	211
2004	37,423	81,790	13,453	60,040	8,070	228
2005	33,727	73,310	11,619	53,270	8,220	197
2006	31,765	63,260	9,785	45,980	7,330	166
2007	28,374	50,420	7,016	36,850	6,430	119
2008	31,702	40,240	5,860	28,740	5,530	99
2009	21,457	36,780	3,696	28,380	4,640	63
2010	21,457	35,880	3,696	28,380	3,740	63

Appendix Table A1. Reconstructed total catch (in tonnes) by major taxonomic category for Gabon, 1950-2010. 'Others' contain 55 additional taxonomic category.

Year	*Ethmalosa fimbriata*	*Pseudotolithus* spp.	Sphyraena	*Dentex* spp.	*Polydactylus quadrifilis*	Shrimps	Others
1950	3,190	347	148	159	96	-	647
1951	3,500	440	187	201	122	-	410
1952	3,680	491	209	225	136	-	433
1953	4,100	467	199	214	129	-	413
1954	4,300	527	224	241	146	-	464
1955	4,990	437	186	200	121	-	384
1956	5,240	508	216	232	141	-	446
1957	5,540	597	253	273	165	-	535
1958	6,860	855	356	391	232	1	898
1959	7,970	1,197	494	547	322	1	1,336
1960	9,110	1,546	635	706	414	2	1,780
1961	10,140	1,889	763	861	497	3	2,411
1962	11,230	2,244	899	1,022	586	4	2,990
1963	12,400	2,611	1,045	1,189	681	5	3,512
1964	13,600	3,006	1,193	1,368	777	6	4,207
1965	15,610	3,285	1,319	1,496	859	5	4,341
1966	16,420	3,606	1,419	1,639	925	8	5,273
1967	17,230	3,929	1,520	1,783	990	10	6,206
1968	18,500	3,907	1,553	1,777	1,014	10	5,396
1969	18,770	3,989	1,586	1,813	1,038	12	5,438
1970	20,020	3,960	1,618	1,805	1,058	9	4,659
1971	20,290	4,040	1,651	1,840	1,081	10	4,713
1972	20,560	4,119	1,684	1,876	1,104	12	4,767
1973	21,560	3,969	1,622	1,807	1,064	13	4,582
1974	21,830	4,049	1,655	1,842	1,087	14	4,640
1975	22,330	5,571	1,723	2,289	1,125	10	5,648
1976	24,300	6,106	1,968	2,541	1,286	31	6,116
1977	26,680	6,346	2,261	2,731	1,479	223	6,371
1978	26,860	7,558	2,289	3,076	1,492	1,409	7,203
1979	27,310	9,098	2,351	3,528	1,527	1,506	8,437
1980	30,010	9,293	2,683	3,723	1,746	1,608	8,653
1981	31,960	9,735	2,926	3,948	1,905	2,108	9,145
1982	33,880	10,743	3,165	4,330	2,060	1,710	9,921
1983	36,650	11,065	3,509	4,565	2,286	1,630	10,259
1984	34,860	11,163	3,287	4,499	2,140	1,637	10,328
1985	34,920	9,990	3,128	3,715	2,041	1,701	10,313
1986	33,220	9,316	2,948	3,637	1,919	1,906	9,088
1987	31,680	8,602	2,698	3,233	1,765	2,114	8,300
1988	31,670	8,484	2,696	3,293	1,769	1,373	9,115
1989	28,780	6,879	2,336	2,758	1,530	1,348	7,139
1990	26,980	7,222	2,225	2,668	1,428	825	6,846
1991	26,820	8,454	2,273	2,965	1,431	939	7,355
1992	28,450	8,458	2,513	3,488	1,545	966	8,924
1993	30,100	9,540	2,709	3,485	1,646	540	10,661
1994	33,310	9,535	3,072	3,674	1,925	661	10,918
1995	34,030	9,692	3,181	3,787	1,819	898	14,053
1996	29,970	9,907	3,159	3,083	1,371	956	19,609
1997	33,520	9,331	3,222	3,039	1,524	2,250	15,757
1998	36,260	11,205	3,347	3,320	1,377	2,666	17,750
1999	34,540	10,487	3,102	2,725	1,394	1,278	15,878
2000	35,600	10,202	3,562	3,153	1,685	2,456	17,087
2001	33,270	9,748	4,189	3,245	1,663	1,947	17,607
2002	34,990	10,670	4,308	3,707	2,538	1,833	17,831
2003	35,420	11,564	4,452	3,707	3,880	3,544	16,699
2004	34,310	14,156	4,552	3,839	5,102	2,394	17,438
2005	31,000	12,722	3,791	3,595	3,534	1,920	16,754
2006	28,590	10,180	2,837	2,872	2,586	2,207	13,990
2007	24,220	7,509	2,145	2,372	2,505	550	11,118
2008	20,100	6,167	1,849	1,786	2,155	163	8,011
2009	18,670	5,636	1,888	1,883	1,875	102	6,728
2010	18,200	5,498	1,830	1,820	1,837	102	6,600