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Construction and Potential Applications of a Global Cost of Fishing Database

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12

13   **ABSTRACT**

14

15   The development of a global database of fishing cost is first described and then an

16   overview of fishing cost patterns at the national, regional and global scales is

17   provided. This fishing cost database provides crucial economic information that is

18   necessary for assessing the economics of global fisheries and is useful for

19   incorporation into sustainable management. The database was organized into two

20   broad cost categories, that is, variable and fixed costs, for 144 maritime countries.

21   Together, these countries captured approximately 98% of global landings in 2005.

22   The cost data is categorized into country and gear type combinations, and this

23   structure allows the cost data to link to spatially defined catch database for future

24   analysis in both spatial and temporal dimensions. Costs also varied between gear

25   types with tuna longliner and dredge being the gears with the highest variable and

26   total fishing costs. When comparing costs across FAO regions, Oceania is shown to

27   have the highest unit variable cost. The global average variable and total cost per

28   tonne of catch in 2005 is estimated to range between US$ 608 and US$ 1,356 and

29   US$ 732 and US$ 1,605, with middle values of US$ 970 and US$ 1,155, respectively.

30   We estimate the total annual global variable fishing cost to be in the range of US$

31   58 – 129 billion with an average of US$92 billion per year in year 2005 dollars.

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34

1. Introduction

Socio-economic indicators of fisheries such as fishing cost and gross revenue play an important role in economic analysis and ecosystem modeling, and thus are useful pieces of information for sustainable fisheries management policy decision and planning processes (Sainsbury and Sumaila 2001, Le Gallic 2002, Christensen *et al.* 2009). These indicators are useful for monitoring and assessing the economic and social performance of fisheries and the impact of fisheries in a broader context. However, most of these data are neither well documented nor readily available. Deficiency of these data may lead to inaccurate estimation of management options.

On the global scale, researchers and inter-governmental agencies have recently put effort into collecting, compiling, analyzing and making available key economic data such as ex-vessel prices and subsidies (e.g., Sumaila *et al.* 2006 and FAO 2008). However, fishing cost data are still poorly documented and studied on a global scale. Fishing cost and cost structure vary depending on the type of fishing, and the gear and vessel types employed. With fishing cost data, various types of social and economic analysis on global fisheries can be made possible. Researchers and fisheries managers can utilize these data for assessing the current economic status of the fishery sector. Socio-economic analyses such as identifying the most appropriate management measures by comparing the economic efficiency of fisheries under different options are made to be feasible with the launching of this global database. Clark (1979) stated that it is a general principle to include the cost of fishing in the analysis of the optimal

58 management of renewable resources. In addition, cost data is also important for

59 estimating fishing fleet effort data as the costs determine the distribution of fishing

60 fleets around ports. Last but not least, researchers may use the information to study

61 the impact on the economics of fisheries and its ripple effects on society under

62 various climate change scenarios. Therefore, to understand the economic viability of

63 the fisheries sector, it is crucial for us to have information on cost of fishing.

64

65 At the fisher level, this information may help them to estimate their cost of fishing in

66 subsequent fishing seasons, which can help them decide whether to go fishing and

67 invest further in fishing gears. As commercial fishers would only go fishing when

68 doing so is profitable, no fishing and investment will occur when the stock level

69 declines to below the variable-cost bionomic equilibrium unless the fishers are

70 subsidized by the government (OECD 2005, Schrank 2003, Sumaila and Pauly 2006).

71

72 Although fishing cost is important information in analyzing, managing and studying

73 fisheries, a global cost of fishing database did not exist until now. Fishing cost data in

74 most of the countries and regions is scarce, widely scattered and incomplete. There

75 are several reasons for the fishing cost data deficiency and they include fisheries

76 enterprises are generally reluctant to disclose their fishing cost information because

77 this information might be exploited by their competitors (Obeng 2003). In addition,

78 there is generally no mandatory law in most of the countries for fisheries to

79 systematically record and provide this kind of information (Bonzon 2000, Gasalla *et*

80 *al.*, in press, Whitmarsh *et al*. 2000). Meanwhile, there is usually no mutual trust

81   between the fishers and the government institutions. As fishing cost is not

82   systematically collected by many countries, there is no global data set of cost of

83   fishing.

84

85   On the regional scale, the Annual Economic Report (2005) on 'Economic

86   performance of selected European fishing fleets' provides comprehensive cost and

87   landing data for different vessel types operating in 20 European countries. For

88   countries in other regions, fishing cost data of each country are usually collected by

89   their own government and non-governmental bodies and this information is available

90   on their websites or reported in Annual Reports, for example, Japan (Statistics

91   Department, Ministry of Agriculture, Forestry and Fisheries, 2006) and the United

92   Kingdom (Sea Fish Industry Authority[1]). In the United States, the National Oceanic

93   and Atmospheric Administration (NOAA) reports the cost-earning data of

94   commercial fishing vessels in several regions, e.g., Northeast U.S. (Gautam and Kitts

95   1996, NOAA 2009). However, for a large proportion of countries, fishing cost data is

96   not collected or not made available to the public by the government. Scattered

97   information on fishing cost data can only be found in published and gray literatures of

98   various fisheries studies. The United Nations Food and Agricultural Organization

99   (FAO) also provides fishing cost information for some countries in its technical

100   papers (e.g., Lery *et al.* 1999). However, FAO does not provide a comprehensive

101   database of fishing cost on a global scale. The World Bank and FAO (2008)

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[1]   Sea   Fish   Industry   Authority   (SeaFish),   accessed   2009.
http://www.seafish.orgStatistics.

102   attempted to estimate global fishing cost in the Sunken Billion project, a project that

103   sought to evaluate the loss of economic rent due to the mis-management of world

104   fisheries. They estimated the global total fishing operating cost (including fuel and

105   labor) to be about $80 billion in 2004. However, the cost information reported in the

106   Sunken Billion project was only based on the detailed cost data of European fleets

107   and India's fisheries. The fisheries of these countries only contributed about 8.5

108   percent to global marine fish landings in 2004 (World Bank and FAO 2008) and

109   hence the results might not be robust. In order to improve upon this estimate, we have

110   developed the current global database.

111

112   In this paper, we describe the procedure for creating the global cost of fishing

113   database and its structure. Then, we discuss the preliminary results extracted from this

114   database and provide an overview of the fishing cost pattern among countries and

115   gear types.

116

117

118   2. **Methods**

119

120   2.1   Developing global fishing cost database

121   There are three major steps in creating the cost of fishing database. Firstly, we

122   categorize cost of fishing and design the structure of the database. Secondly, we

123   collect raw cost data from different sources. Finally, we fill in data gaps by using a

124   simple interpolation method.

125

2.1.1   Data categorization and database design

Our categorization of cost is based on Annual Economic Report (2005) (European Commission 2006) as it provides more comprehensive definitions of different fishing cost categories among other literatures. Two types of costs, variable (operating) and fixed costs were captured into the database. Costs associated with operating fishing vessels were categorized as variable costs because they vary with the level of fishing activity. The major items under variable costs include fuel cost, salaries for the crew members on board, repair and maintenance cost and those costs depended on vessel activities, excluding fuel, for example, cost of selling fish via auction, cost of treating fish (for example, ice), food, etc. Fixed cost, which is usually regarded as sunk cost, can be defined as the amount that the fishers invested on the vessels. Interest and depreciation costs fall into this category. Interest cost reflects the opportunity cost of capital whereas the depreciation cost is the replacement cost for normal wear and tear of the fishing vessels. Other than the cost data, we also compiled data on the country name, gear type, vessel type and the reported catch values if they are also available in the data sources.

The structure of the database also needed to be carefully designed, so the cost of fishing database can be linked to other databases of the *Sea Around Us Project*.

2.1.2   Data collection

148

149   Fishing cost includes the capital cost of the fishing vessels, expenses at the head

150   offices, salaries for labor, fuel cost, repair, maintenance, etc. Following Sumaila *et al.*

151   (2007), we focused on collecting secondary data for vessels operating in major

152   fisheries and in major fishing nations in each of the six FAO regions of the world: (1)

153   Africa; (2) Asia; (3) Europe; (4) North America; (5) Oceania; and (6) South and

154   Central America, including the Caribbean. The first step is to identify the sources of

155   the fishing cost data. The major data sources of fishing cost are secondary data, which

156   mainly comes from published literature, websites and gray literature, such as

157   government, FAO and consultant reports. Next, we contacted our partners all over the

158   world to help us locate available data. To facilitate the data collection process, we

159   designed a data form and distributed it to colleagues based in different parts of the

160   world.

161

162   We targeted our data collection effort on major fishing countries in each of the six

163   FAO regions with a combined total catch of over 98% of the global landings in 2005.

164   By using this approach, we made sure that we captured the cost data for most

165   fisheries in each region thereby ensuring a truly representative sample.

166

167   In order to capture as much raw data as possible, we tried to access all available

168   sources of data disregarding the year and extending our efforts in collecting cost data

169   from 1950 to the most recent year for which data is available. The data were then

170   converted to 2005 real values. We used the consumer price index (CPI) for each

171   country obtained from the World Bank database (2007) to reduce nominal cost to real

172   ones with 2005 as the base year. To make the comparison of fishing cost among

173   different regions and countries possible, we converted all the raw fishing cost data

174   from local currencies to US dollars by using currency exchange rates provided by the

175   World Bank (2007).

176

177   To allow analysis on comparing fishing costs among regions and countries, we

178   standardized the cost data to annual cost per tonne of catch (US$/tonne). By

179   standardizing the data in this way, we are able to link our cost data to the *Sea Around*

180   *Us Project* catch databases for further analysis.

181

182   2.1.3   Progressive Refinement Process for filling data gaps

183

184   To estimate the cost of all gear types in each fishing country from the raw cost data

185   we collected, we adopted a process of progressive refinement (Tyedmers *et al.* 2005),

186   where more specific estimates regarding a given region and gear type are computed to

187   replace the average cost values at each step. Therefore, we can make sure that all the

188   gear types in each maritime country of the world were assigned with a cost, either the

189   raw data where it is available or an appropriate average cost.

190

191   Before interpolating the data, the raw data was examined for outliers as the estimated

192   cost data can be heavily influenced by extreme values. Instead of trimming off the

193   outliers, we used a method called Winsorization, which is an approach for replacing

9

194   all extreme data points with a data dependent or predetermint value before estimating

195   the population mean (Gwet and Rivest 1992). The mean squared error of the

196   winsorized sample mean was found to be smaller than that of sample mean (Searls

197   1966, Ernst 1980, Fuller 1991). In this study, all outliers were set to a specified

198   percentile of the data. An 80% Winsorization was used to set all the data below the

199   10th percentile equal to the value corresponding to the 10th percentile, and the data

200   above 90th percentile equal to the 90th percentile.

201

202   After filling the database with raw data where this is available, we attempted to attain

203   a realistic and quick estimation of the fishing cost data for the whole world by using

204   the progressive refinement process, which comprised of three major steps described

205   in more detail in Appendix I. To provide all combinations of gear types and countries

206   with an initial estimate, we first started by calculating the overall weighted-by-catch

207   average cost values based on all the raw data from the data sources disregarding gear

208   type and country.

209

210   Secondly, we assume that vessels with the same gear type have similar fishing costs

211   regardless of their FAO regions. With this assumption, if a fishing gear type in an

212   FAO region did not have any cost data from any source, then it can get a more

213   specific estimate from the average costs of the same gear type of all other FAO

214   regions combined. We computed weighted-by-catch average costs for each cost types

215   of each gear type from all the FAO regions. These values are also adjusted by the

216   overall average fishing cost ratio between regions and this estimate replaced the more

217   general estimate from the previous step.

218

219   Finally, we assume vessels with the same gear type have similar fishing costs within

220   the same region, so a more specific estimate can be assigned to a particular gear type

221   in a country without any raw data. This last step is to obtain the weighted-by-catch

222   average costs of each gear type from all the raw data with the same gear type in each

223   FAO region. Then, we assigned this value to the same gear type of all the countries in

224   the same FAO region where raw data was not available. At this point, every gear type

225   in each fishing country should have been assigned a more specific cost data if raw

226   data was not available.

227

228   A scoring system was used to capture some indication of the quality of the cost

229   estimates. In this system, a score was assigned to the data in each of the above step in

230   order to indicate whether the data is from the raw data, the same gear type in the same

231   region, the same gear type in other regions or the global average. This scoring system

232   allows researchers to identify which areas and fisheries have the best quality of cost

233   data and areas where future efforts need to be concentrated on.

234

235

236   2.2   Fishing costs analysis

237

238   Although we collected both variable and fixed costs in our database, we mainly

239   focused on variable costs in the following analyses. Fixed costs were not given as

240   much weight as variable costs in the following analyses because the former is only

241   incurred once by vessel owners and fishers and therefore can be considered sunk

242   costs. Therefore, once the investment on vessels and gears has been made, variable

243   cost is the only cost that the fishers and vessel owners need to consider when they

244   decide whether to continue fishing, i.e., revenues exceed the variable costs (Clark

245   2006).

246

247   With the interpolated cost data, we compared fishing costs across countries and FAO

248   regions. Spatial distribution of variable fishing cost was also plotted to assess the

249   pattern of fishing costs on a global scale. We also compared the difference in fishing

250   cost across different gear types. This allows us to assess the cost effectiveness of

251   different gear types. Finally, a global weight-by-catch average variable fishing cost in

252   2005 was estimated using all the cost data regardless of gear type, country and year.

253   By combining the average cost data with the total global landings, the total variable

254   fishing cost of 144 maritime countries is computed.

255

256

257   3. Results

258

259   3.1   General description of fishing cost raw data in the database

260

261   The number of observations collected from each country in the cost of fishing

262   database is summarized in Table 1. Cost information categorized by countries and

263   gear types are described below.

264

265   3.1.1   Countries

266

267   As of the 20th of August 2010, we had cost data for 41 countries out of 144 maritime

268   countries, covering the years from 1985 to 2009. These 41 countries in our database

269   contributed up to 79% of global landings in 2005. Table 1 shows that each FAO

270   region of the world is represented in the raw data, although we have most raw data

271   records in Europe. Countries with data are highlighted in Figure 1 and the percentage

272   of catch contributed by these countries to regional and global landings are also given

273   in the figure. In economic terms, all of these countries contributed 77% of the global

274   landed value in 2005 (Figure 2). Among these 41 countries, 29 of them were

275   categorized as developed countries and 12 of them are developing countries (UNDP

276   2008).

277

278   3.1.2   Gear Type

279

280   We had raw fishing cost data for 12 gear types out of 18 gear types, which were

281   identified according to the gear categorization system of the *Sea Around Us Project*.

282   Table 2 summarizes the cost records in the raw data by gear types. All major fishing

283   gears are represented in the raw data. Bottom trawls, which contributed about 18% of

284 total catch in 2005, constituted the majority of observations, representing 42% of the

285 total raw data. Gillnets and hook and lines are the next gear types with the most cost

286 information in this database. About 22% of total catch in 2005 are caught by these

287 two gear types. They contributed about 30% to all of the raw fishing cost data.

288

289 3.2   Fishing cost analysis using estimated data

290

291 3.2.1   Developed versus developing country fishing cost

292

293 When we combined all the interpolated and raw data, we estimated the global average

294 variable cost per tonne of catch in 2005 to be approximately US$ 970. The estimated

295 global average fixed cost per tonne of catch in 2005 was US$ 186. All the raw and

296 estimated cost data by countries in the database are shown in Appendix II. The

297 weighted mean, lower bound and upper bound, which were computed based on 90%

298 confidence interval, of all the cost types in the database are shown in Table 3. For the

299 62 developed countries, which have Human Development Index (HDI) >= 0.8

300 (UNDP 2008), the weighted average real (2005) variable cost per tonne of catch was

301 estimated to be US$ 1,171 and the weighted average real (2005) fixed cost per tonne

302 of catch was US$ 197. For the 82 developing countries, which have HDI < 0.8

303 (UNDP 2008), the weighted average real (2005) variable cost per tonne of catch was

304 estimated to be US$ 815 and the weighted average real (2005) fixed cost per tonne of

305 catch was US$ 177.

306

307 3.2.2   Fishing costs across FAO regions

308

309   Figure 3 presents the chart for comparing the average variable cost per tonne of catch

310   across all FAO regions. From this figure, the FAO region with the highest average

311   cost per tonne of catch is Oceania (US$ 2,348/tonne). The catch in this region was

312   mainly caught by bottom trawl (about 30% of total catch in Oceania) which has high

313   variable cost (US$ 1,969/tonne). The fishing costs of other gear types such as tuna

314   longliner, trap, shrimp trawl, hook/line and dredge were extremely high in this region.

315   These exceptionally high cost values (> US$ 4,000/tonne) pull up the weighted

316   average cost in Oceania. Meanwhile, the cost data in the Pacific Islands where most

317   of them are developing countries were estimated using the data in developed

318   countries in the same region as raw data in these islands were not available. Therefore,

319   there is a possibility for the cost data in Oceania to be overestimated. From Figure 3,

320   Africa and South, Central America and Caribbean are shown to have the lowest

321   average variable cost per tonne of catch and the values are US$ 748/tonne and

322   US$343/tonne, respectively.

323

324   When comparing the cost structure across FAO regions (Figure 4), labour cost

325   constitute the largest proportion of the operating cost in all of the regions except

326   Africa. The percentage of the labour cost to the total variable cost is the highest in

327   North America (56% of the total variable cost) when compared with those in other

328   regions (Figure 4). High labour cost may be due to the high gross national per capita

329 income of the two main countries in this region, United States and Canada, (World

330 Bank[2]).

331

332 3.2.3 Comparing cost of fishing across different fishing gears

333

334 There are 18 gear types in the fishing cost database. The weighted average variable

335 costs of each gear type are summarized in Table 4. Among all the gears with raw data,

336 tuna longlines have the highest average variable cost (US$ 2,560/tonne) estimated

337 from our data. The high cost of this gear type can be compensated by the high ex-

338 vessel price of tuna. Dredge is the next gear type with the highest average variable

339 fishing cost (US$ 2,235/tonne). This category includes dragged gear, sweep nets,

340 runner nets, hand dredges, boat dredges and mechanical dredges. Labour cost

341 (payments to crew and captain) contributed the largest proportion of variable cost for

342 dredge as this gear type usually requires more labour for processing meat from

343 shellfish such as scallops at sea. Since vessels using dredge usually operate for

344 twenty-four hours per day and ten to twenty days per trip, larger crew sizes are

345 needed (Kirkley *et al.* 1995). The average variable costs of vessels using net, seine

346 and mid-water trawl were estimated to be the lowest among other gear types. Vessels

347 using static gears such as nets and seines generally consume less fuel and thus have

348 lower operating cost. Mid-water trawls are generally towed at different depths above

349 the bottom in the water column. The mid-water trawls are usually towed by otter

350 trawl or towed behind two boats (pair trawling). Vessels using otter trawl consume

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[2] World Bank, accessed 2009.
http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf.

351   50% less fuel than those using other trawling methods such as beam trawl (Polet *et al.*

352   2006).

353

354   3.2.4   Global cost of fishing

355

356   The total estimated inflation adjusted variable fishing cost (in 2005 US dollars) of

357   144 maritime countries is estimated at about US$ 92 billion in 2005. Total variable

358   fishing cost estimation from our database is higher than the cost estimation from the

359   Sunken Billions study (World Bank and FAO 2008), which is just 87% of the total

360   variable cost estimated from this project. This discrepancy is likely due to the

361   difference in the methodologies used in these two projects and the coverage of

362   observations of raw cost data.

363

364   3.3   Global pattern of fishing cost

365

366   The spatial distribution of total variable fishing cost in the world in 2005 is shown in

367   Figure 5. Our database suggested that countries in the coastal areas of Asia, North

368   America, Europe and West Africa have higher total variable cost of fishing. When we

369   compared the average variable fishing cost per tonne of catch among different

370   locations (Figure 6), the highest unit fishing cost areas are the coastal regions along

371   Eastern Australia and the Antarctic regions. This can be explained by the presence of

372   fishing gears with high variable fishing costs operating in these areas. The lowest unit

373   fishing cost can be found in areas along the coasts of Chile in South America and

17

374   Namibia in Africa. Peru and Benguela currents flowing along the coastal regions of

375   Chile and Namibia, respectively, boost up the volume of marine catch such as the

376   landing of anchovies in Chile and hence pull down the unit operating cost.

377

378

379   4. Discussion

380

381   In this paper, we demonstrated the procedures for developing a global cost of fishing

382   database and its potential applications. This is the first version of what we consider a

383   'living' database, which we will continue to update and improve. Having said that,

384   the current version of the database will be useful in aiding researchers, fisheries

385   managers and interested parties to assess the economic status and impact on fisheries

386   at different spatial scales under different management policies scenarios. When

387   combined with landed values (e.g., Sumaila *et al*. 2007), this information will be

388   useful for determining global economic rent from fisheries, and the profitability of

389   fishing operations. This database is also useful for mapping port-based effort by fleets.

390   With this cost database, a wide range of research areas can be explored, for example,

391   in assessing the cost structure of different gear types in different regions of the world,

392   evaluating the efficiency of different gear types and vessels and developing fishing

393   cost functions.

394

395

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522

FIGURES & TABLES

524

525 **Table 1.** Raw cost data records by countries and regions of the world. There are

526 41 out of 144 maritime countries.

Regions	Country	Number of records	Regions	Country	Number of records
Europe	Belgium	18	**South, Central**	Argentina	6
	Denmark	22	**America and**	Brazil	9
	Estonia	23	**Carribbean**	Chile	9
	Finland	19		Peru	12
	France	41		Trinidad and Tobago	3
	Germany	18	**Africa**	Ghana	12
	Greece	12		Namibia	8
	Iceland	24		Senegal	37
	Italy	31		South Africa	4
	Latvia	12	**Asia**	Bangladesh	1
	Lithuania	16		China Main	4
	Netherlands	25		India	28
	Norway	30		Indonesia	11
	Poland	11		Japan	13
	Portugal	27		Korea Rep	15
	Spain	31		Malaysia	10
	Sweden	39		Sri Lanka	2
	UK	36		Taiwan	10
North America	Canada	5		Thailand	9
	USA	249		Vietnam	1
Oceania	Australia	7			

527

528

529   **Table 2.**   Raw cost data records by gear types.

Gear types	Number of records	% of global catch
Seine	89	28
Bottom trawl	383	18
Midwater trawl	69	16
Gillnet	191	12
Hook and line	91	10
Shrimp trawl	6	3
Longline tuna	2	3
Trap	23	2
Dredge	37	2
Pole line tuna	0	2
Net	9	1
Purse seine tuna	0	1
Hand	0	1
Spear	0	< 0.5
Castnets	0	< 0.5
Liftnet	2	< 0.5
Trammel	1	< 0.5
Bomb/chemical	0	< 0.5
Liftnet	2	< 0.5

530

531

532 **Table 3.** Summary statistics of all the cost types in the cost of fishing database

533 based on all data (both raw and interpolated) (US\$/tonne of catch in

534 2005 real value). The lower and upper bounds are calculated based on

535 90% confidence interval.

Cost types	Weighted Mean	Lower bound	Upper bound
Variable cost			
Fuel cost	234	157	314
Running cost [*]	197	120	281
Repair cost	124	78	175
Labor cost	415	252	586
Fixed Cost			
Depreciation	114	72	159
Interest	71	53	91
Total fishing cost	1,155	732	1,605

536

537 **Table Notes:**

538 [*] Running cost includes those costs depended on vessel activities, excluding fuel, for

539 example, cost of selling fish via auction, cost of treatment of fish (for example, ice),

540 food, etc.

541

542

543

544 **Table 4.**   Summary statistics of the variable and total fishing cost of each gear

545   type (US$/tonne of catch).

SuperGear	Variable cost	Total cost	Landed values[b]
longline tuna	2,560	3,110	2,865
dredge	2,235	2,487	765
trammel	2,126	2,247	1,992
hook and line	1,761	2,007	1,276
trap	1,725	2,001	2,618
shrimp trawl	1,697	1,987	3,820
bottom trawl	1,156	1,366	977
gillnet	963	1,266	839
liftnet	1,087	1,220	894
pole line tuna[a]	979	1,111	3,696
hand[a]	979	1,111	723
purse seine tuna[a]	979	1,111	5,802
castnets[a]	979	1,111	821
bomb/chemical[a]	979	1,111	416
spear[a]	979	1,111	504
midwater trawl	511	614	519
seine	470	571	331
net	359	424	

546

547 **Table Notes:**

548 [a] No raw data for these gear types. The weighted mean is based on the overall average

549 of the raw data from other gear types.

550 [b] Landed values per unit tonne of catch are extracted from ex-vessel price database of

551 *Sea Around Us Project*.

552
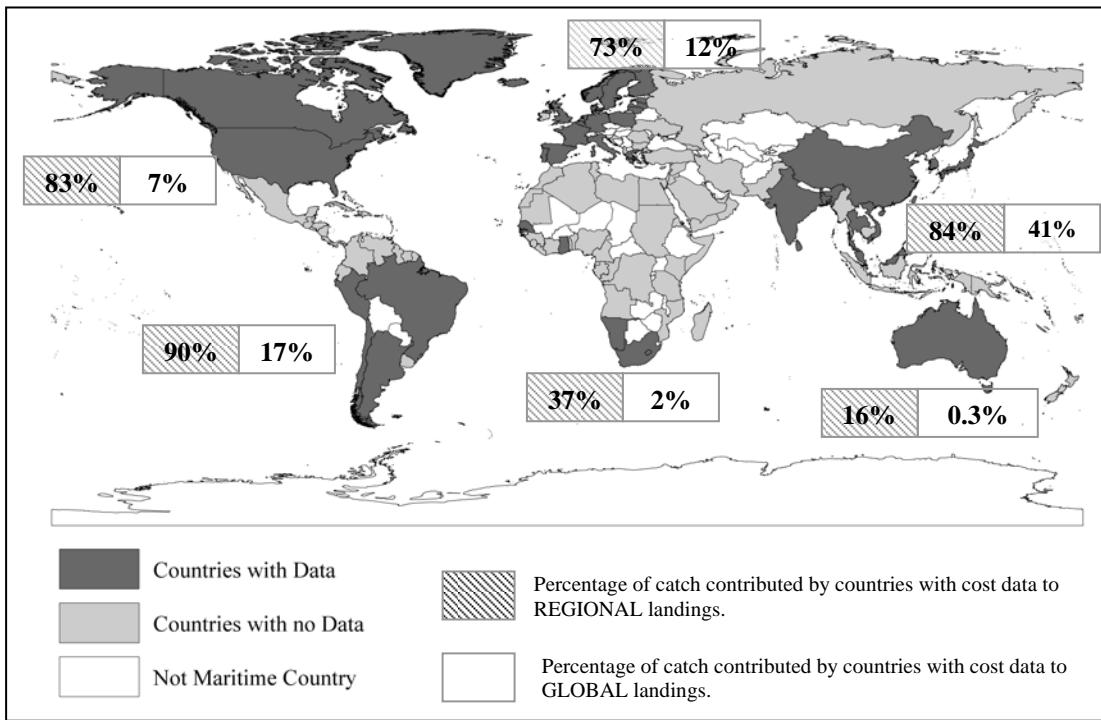
Figure 1. Countries with fishing cost data in the database and percentage of catch contributed by these countries to regional and global landings.

Figure 2.   Percentage of landed values contributed by the countries with cost data

to regional and global landed values.
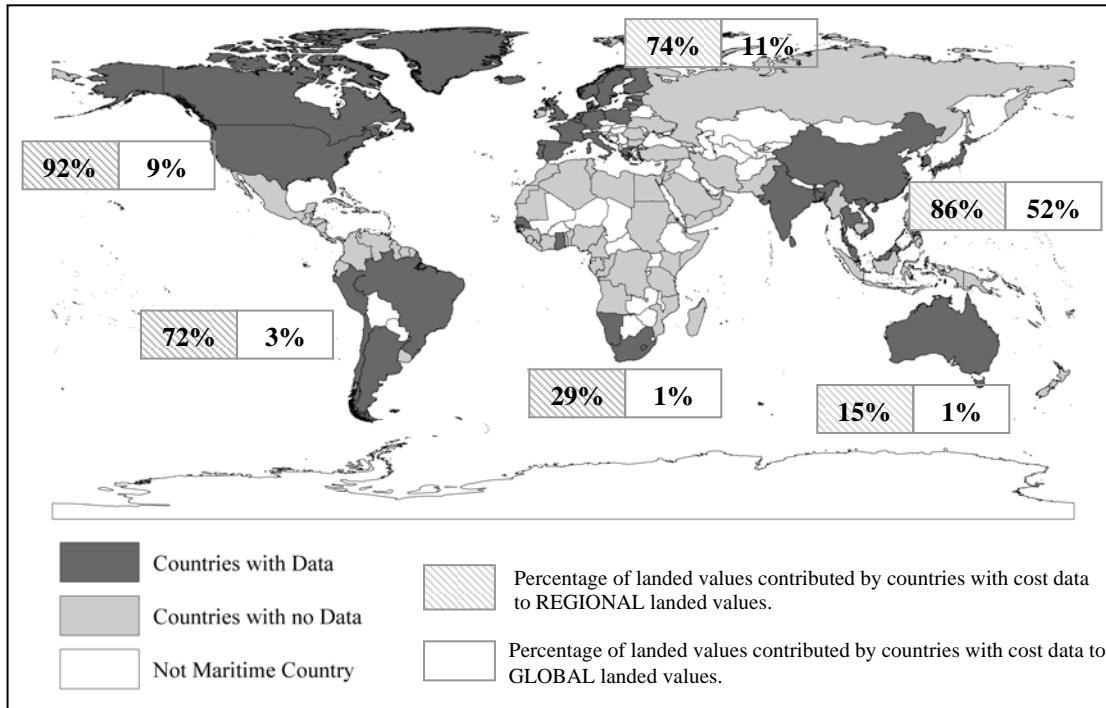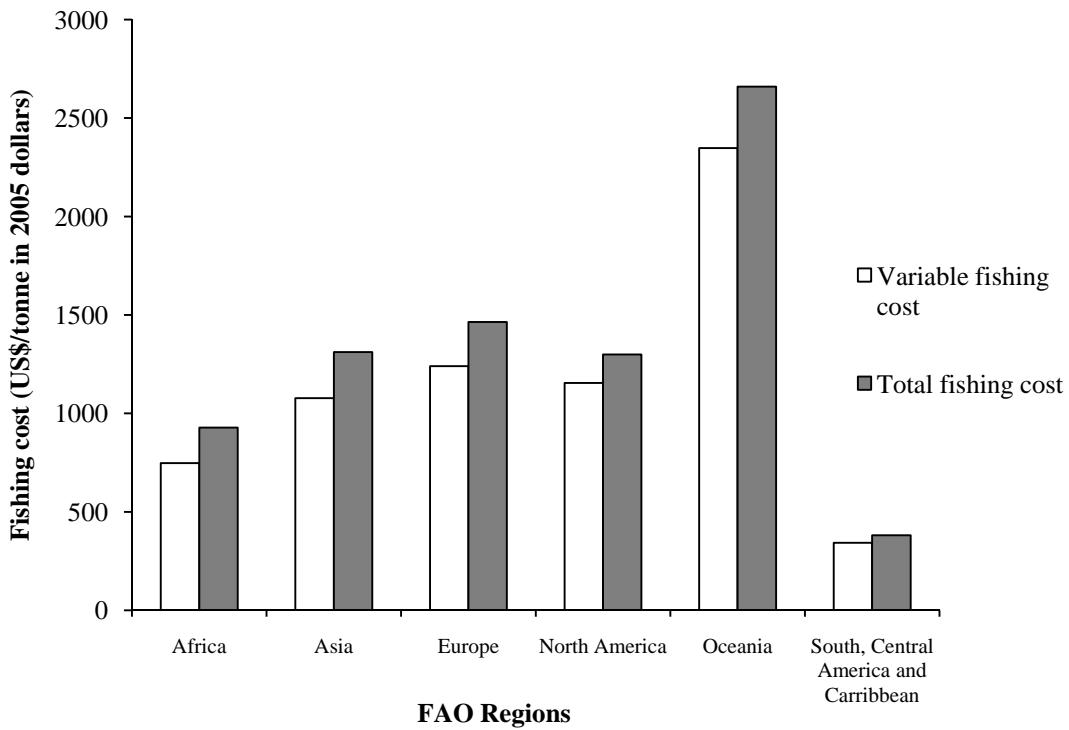
592

593

594 **Figure 3.** Comparing the average variable and total fishing cost per tonne of

595 catch (US$/tonne) across FAO regions.

596
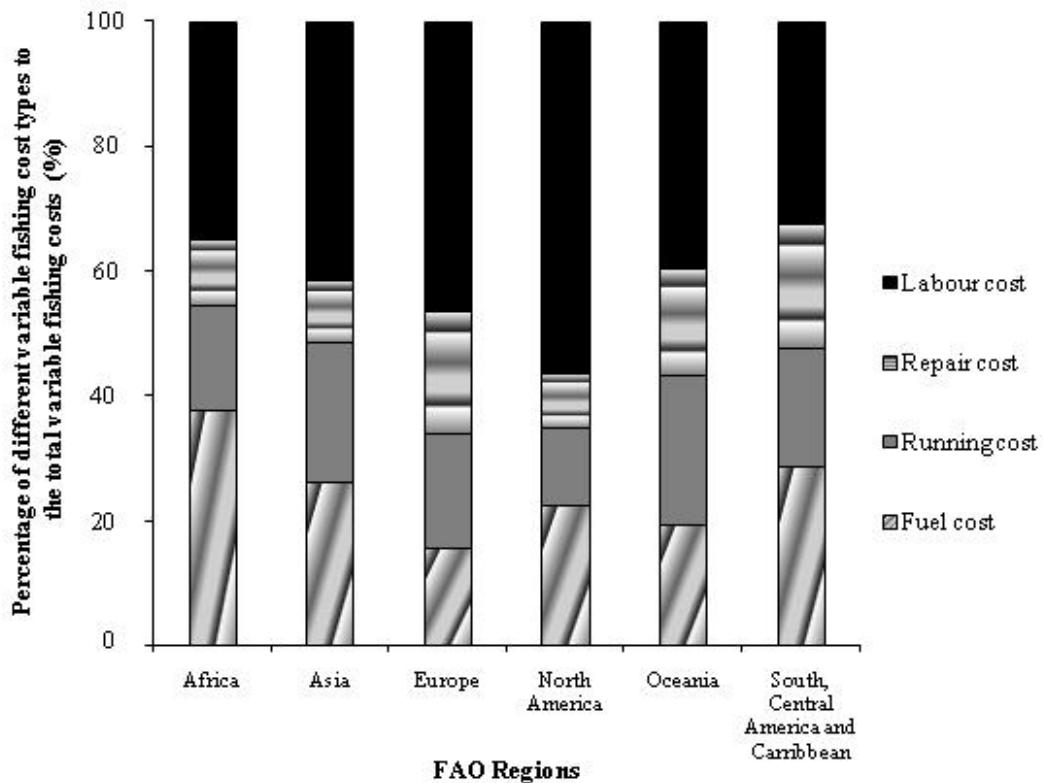
Figure 4. Percentage of different variable fishing cost types to the total variable fishing costs in the six FAO regions.
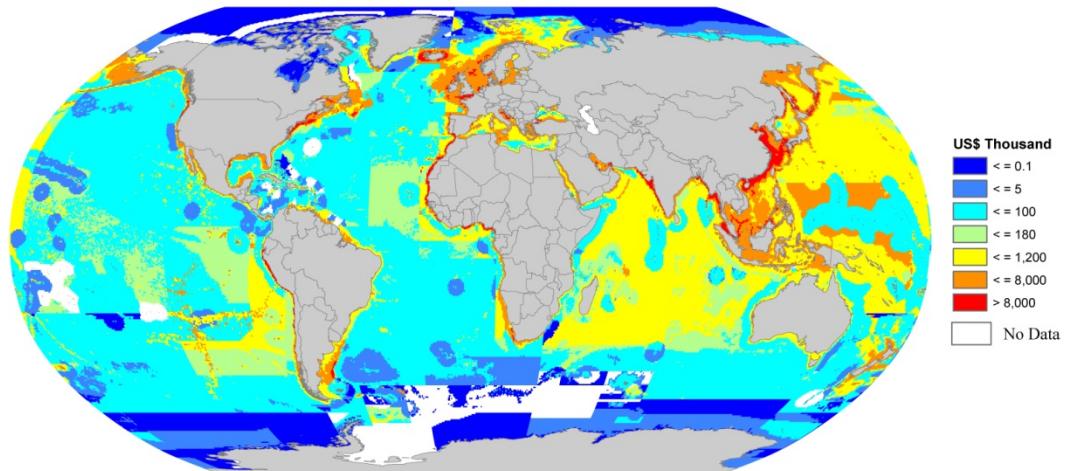
605
606

607 **Figure 5.** Total variable fishing cost (US$ thousand) in 2005.

608

609
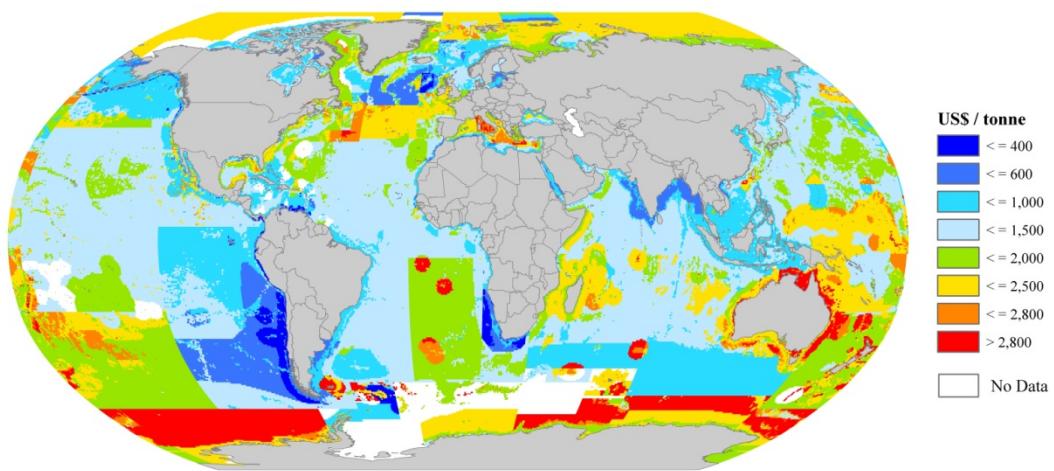
610

611

612 **Figure 6.** Average variable fishing cost per tonne of catch (US$/tonne) in 2005.

613

614

615 **Appendix I**

616

617 **PROGRESSIVE REFINEMENT PROCESS**

618

619 After filling the database with raw data where this is available, we attempted to attain

620 a realistic and quick estimation of the fishing cost data for the whole world by using a

621 progressive refinement process, which comprised of three major steps. To provide all

622 combinations of gear types and countries with an initial estimate, we first started by

623 calculating the average cost values based on all the raw data collected disregarding

624 gear type and country,

$$\bar{c} = \frac{\sum_{i=1}^{n} c_i h_i}{\sum_{i=1}^{n} h_i} \tag{3}$$

625 where $\bar{c}$ is the average cost data (US\$/tonne), c_i is the raw fishing cost (US\$/tonne)

626 for each country and gear combination, h_i is the catch (tonnes) of each country and

627 gear combination.

628

629 Secondly, we assume that vessels with the same gear type have similar fishing costs

630 regardless of their FAO regions. With this assumption, if a fishing gear type in an

631 FAO region did not have any cost data from any source, then it can get a more

632 specific estimate from the average costs of the same gear type of all other FAO

633 regions combined. To get this estimate, we computed the average cost of each gear

634 type in each region and then calculated the average cost ratio between two regions,

635 R_{ik}, which is given by:

$$R_{ik} = \frac{\bar{c}_i}{\bar{c}_k} \tag{4}$$

636 where $\bar{c}_i$ is the ratio of average cost in one region and $\bar{c}_k$ is the average cost of

637 another region. The weighted average cost for gear type j in region i can be calculated

638 from other regions, $\bar{c}_{ji}$, and is given by:

34

$$cji = \frac{\sum\limits_{k=1}^{n} c_{jk} h_{jk} R_{ik}}{\sum\limits_{k=1}^{n} h_{jk}}$$

(5)

639   where c_{jk} is the average cost of gear type j in region k, h_{jk} is the catch of gear type j in

640   region k, R_{ik} is the cost ratio of region i to region k and n is the total number of

641   regions with cost for gear type j.

642

643   Finally, we assume vessels with the same gear type have similar fishing costs within

644   the same region, so a more specific estimate can be assigned to a particular gear type

645   in a country without any raw data. The last step is to obtain the weighted average

646   costs of each gear type in each FAO region,

$$cji = \frac{\sum\limits_{m=1}^{n} c_{jm} h_{jm}}{\sum\limits_{m=1}^{n} h_{jm}}$$

(6)

647   where c_{ji} is the weighted average cost of gear type j in region i, c_{jm} is the average cost

648   of gear type j in country m, h_{jm} is the catch of gear type j in country m, n is the total

649   number of countries with cost for gear type j in region i. Then, we assigned this value

650   to the same gear type of all the countries in the same region where raw data was not

651   available. At this point, every gear type in each fishing country should have been

652   assigned a more specific cost data if raw data was not available.

653

Appendix II.   List of all the raw and estimated average variable and fixed fishing cost data by
countries.

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Albania	N	bottom trawl	(2263.59)	(386.65)	
Albania	N	dredge	(2222.77)	(338.42)	
Albania	N	gillnet	(2412.41)	(461.02)	
Albania	N	hand	(978.61)	(132.80)	
Albania	N	hook and line	(2231.00)	(363.72)	
Albania	N	longline tuna	(3813.03)	(663.89)	
Albania	N	midwater trawl	(493.14)	(126.82)	
Albania	N	pole line tuna	(978.61)	(132.80)	
Albania	N	purse seine tuna	(978.61)	(132.80)	
Albania	N	seine	(821.73)	(136.17)	
Albania	N	shrimp trawl	(2550.25)	(420.94)	
Albania	N	spear	(978.61)	(132.80)	
Albania	N	trammel	(3588.50)	(154.80)	
Albania	N	trap	(1995.05)	(177.55)	
Algeria	N	bottom trawl	(1082.10)	(318.75)	
Algeria	N	gillnet	(1019.85)	(338.18)	
Algeria	N	hook and line	(1539.72)	(326.37)	
Algeria	N	longline tuna	(2006.76)	(449.60)	
Algeria	N	midwater trawl	(289.38)	(38.85)	
Algeria	N	pole line tuna	(978.61)	(132.80)	
Algeria	N	purse seine tuna	(978.61)	(132.80)	
Algeria	N	seine	(366.35)	(80.89)	
Algeria	N	shrimp trawl	(1871.74)	(384.45)	
Algeria	N	spear	(978.61)	(132.80)	
Algeria	N	trap	(1568.80)	(188.91)	
Angola	N	bottom trawl	(1082.10)	(318.75)	
Angola	N	gillnet	(1019.85)	(338.18)	
Angola	N	hook and line	(1539.72)	(326.37)	
Angola	N	longline tuna	(2006.76)	(449.60)	
Angola	N	midwater trawl	(289.38)	(38.85)	
Angola	N	pole line tuna	(978.61)	(132.80)	
Angola	N	purse seine tuna	(978.61)	(132.80)	
Angola	N	seine	(366.35)	(80.89)	
Angola	N	shrimp trawl	(1871.74)	(384.45)	
Angola	N	trammel	(1625.09)	(117.69)	
Angola	N	trap	(1568.80)	(188.91)	
Antigua Barb	N	bottom trawl	(461.12)	(124.63)	
Antigua Barb	N	dredge	(439.29)	(34.27)	
Antigua Barb	N	gillnet	(1204.09)	(29.27)	
Antigua Barb	N	hand	(978.61)	(132.80)	
Antigua Barb	N	hook and line	(1310.53)	(39.21)	
Antigua Barb	N	midwater trawl	(542.28)	(74.37)	
Antigua Barb	N	seine	(171.45)	(20.52)	
Antigua Barb	N	spear	(978.61)	(132.80)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Antigua Barb	N	trap	(651.28)	(114.02)	
Argentina	Y	bottom trawl	417.26	118.70	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Argentina	N	dredge	(439.29)	(34.27)	
Argentina	N	gillnet	(1204.09)	(29.27)	
Argentina	N	hand	(978.61)	(132.80)	
Argentina	N	hook and line	(1310.53)	(39.21)	
Argentina	N	midwater trawl	(568.12)	(75.96)	
Argentina	N	seine	(171.45)	(20.52)	
Argentina	N	shrimp trawl	(927.31)	(137.16)	
Argentina	N	spear	(978.61)	(132.80)	
Argentina	N	trammel	(409.69)	(17.86)	
Argentina	N	trap	(651.28)	(114.02)	
Australia	Y	bottom trawl	1,969.43	155.24	http://www.abare.gov.au/publications_html/fisheries/fisheries_03/afsr03.pdf
Australia	N	dredge	(4098.19)	(369.62)	
Australia	N	gillnet	(1342.82)	(309.85)	
Australia	N	hand	(978.61)	(132.80)	
Australia	Y	hook and line	4,279.31	696.52	http://www.abare.gov.au/publications_html/fisheries/fisheries_03/afsr03.pdf
Australia	N	longline tuna	(4871.04)	(679.38)	
Australia	N	midwater trawl	(642.54)	(104.69)	
Australia	N	net	(759.35)	(79.69)	
Australia	N	pole line tuna	(978.61)	(132.80)	
Australia	N	seine	(1160.16)	(89.56)	
Australia	Y	shrimp trawl	4,364.20	674.00	Galeano et al., 2004
Australia	N	spear	(978.61)	(132.80)	
Australia	N	trammel	(3731.19)	(125.74)	
Australia	N	trap	(4460.19)	(513.25)	
Bahamas	N	bottom trawl	(461.12)	(124.63)	
Bahamas	N	dredge	(439.29)	(34.27)	
Bahamas	N	gillnet	(1204.09)	(29.27)	
Bahamas	N	hook and line	(1310.53)	(39.21)	
Bahamas	N	midwater trawl	(542.28)	(74.37)	
Bahamas	N	seine	(171.45)	(20.52)	
Bahamas	N	trap	(651.28)	(114.02)	
Bahrain	N	bottom trawl	(1071.52)	(192.76)	
Bahrain	N	gillnet	(489.92)	(291.78)	
Bahrain	N	hook and line	(1602.26)	(240.36)	
Bahrain	N	liftnet	(1086.93)	(132.80)	
Bahrain	N	midwater trawl	(655.23)	(106.25)	
Bahrain	N	pole line tuna	(978.61)	(132.80)	
Bahrain	N	seine	(942.33)	(259.16)	
Bahrain	N	shrimp trawl	(1609.08)	(284.40)	
Bahrain	N	trammel	(1992.26)	(129.08)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Bahrain	N	trap	(1363.80)	(325.39)	
Bangladesh	N	bottom trawl	(1071.52)	(192.76)	
Bangladesh	N	gillnet	(489.92)	(291.78)	
Bangladesh	Y	hook and line	1,169.59	118.43	Bay of Bengal Programme, 1993
Bangladesh	N	trap	(1363.80)	(325.39)	
Barbados	N	bottom trawl	(461.12)	(124.63)	
Barbados	N	dredge	(439.29)	(34.27)	
Barbados	N	gillnet	(1204.09)	(29.27)	
Barbados	N	hand	(978.61)	(132.80)	
Barbados	N	hook and line	(1310.53)	(39.21)	
Barbados	N	longline tuna	(482.40)	(54.59)	
Barbados	N	midwater trawl	(542.28)	(74.37)	
Barbados	N	pole line tuna	(978.61)	(132.80)	
Barbados	N	purse seine tuna	(978.61)	(132.80)	
Barbados	N	seine	(171.45)	(20.52)	
Barbados	N	spear	(978.61)	(132.80)	
Barbados	N	trap	(651.28)	(114.02)	
Belgium	Y	bottom trawl	4,121.44	673.61	European Commission, 2006
Belgium	N	dredge	(2222.77)	(338.42)	
Belgium	N	gillnet	(2412.41)	(461.02)	
Belgium	N	hand	(978.61)	(132.80)	
Belgium	N	hook and line	(2231.00)	(363.72)	
Belgium	N	midwater trawl	(493.14)	(126.82)	
Belgium	N	seine	(821.73)	(136.17)	
Belgium	N	shrimp trawl	(2550.25)	(420.94)	
Belgium	N	spear	(978.61)	(132.80)	
Belgium	N	trap	(1995.05)	(177.55)	
Belize	N	bottom trawl	(461.12)	(124.63)	
Belize	N	dredge	(439.29)	(34.27)	
Belize	N	gillnet	(1204.09)	(29.27)	
Belize	N	hand	(978.61)	(132.80)	
Belize	N	hook and line	(1310.53)	(39.21)	
Belize	N	longline tuna	(482.40)	(54.59)	
Belize	N	pole line tuna	(978.61)	(132.80)	
Belize	N	seine	(171.45)	(20.52)	
Belize	N	shrimp trawl	(927.31)	(137.16)	
Belize	N	spear	(978.61)	(132.80)	
Belize	N	trap	(651.28)	(114.02)	
Benin	N	bottom trawl	(1082.10)	(318.75)	
Benin	N	gillnet	(1019.85)	(338.18)	
Benin	N	hook and line	(1539.72)	(326.37)	
Benin	N	longline tuna	(2006.76)	(449.60)	
Benin	N	midwater trawl	(289.38)	(38.85)	
Benin	N	pole line tuna	(978.61)	(132.80)	
Benin	N	purse seine tuna	(978.61)	(132.80)	
Benin	N	seine	(366.35)	(80.89)	
Benin	N	shrimp trawl	(1871.74)	(384.45)	
Benin	N	trap	(1568.80)	(188.91)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Brazil	Y	bottom trawl	582.10	124.63	Gasalla *et al*, 2009
Brazil	N	castnets	(978.61)	(132.80)	
Brazil	N	dredge	(439.29)	(34.27)	
Brazil	Y	gillnet	1,204.09	29.27	Gasalla *et al*, 2009
Brazil	N	hand	(978.61)	(132.80)	
Brazil	Y	hook and line	1,324.20	39.21	Gasalla *et al*, 2009
Brazil	N	liftnet	(224.03)	(132.80)	
Brazil	N	longline tuna	(482.40)	(54.59)	
Brazil	N	midwater trawl	(542.28)	(74.37)	
Brazil	N	pole line tuna	(978.61)	(132.80)	
Brazil	N	purse seine tuna	(978.61)	(132.80)	
Brazil	Y	seine	342.75	20.52	Gasalla *et al*, 2009
Brazil	Y	shrimp trawl	927.31	137.16	Gasalla *et al*, 2009
Brazil	N	spear	(978.61)	(132.80)	
Brazil	N	trammel	(409.69)	(17.86)	
Brazil	Y	trap	1,386.03	114.02	Gasalla *et al*, 2009
Brunei Darsm	N	bottom trawl	(1071.52)	(192.76)	
Brunei Darsm	N	dredge	(2092.03)	(317.27)	
Brunei Darsm	N	hand	(978.61)	(132.80)	
Brunei Darsm	N	spear	(978.61)	(132.80)	
Brunei Darsm	N	trap	(1363.80)	(325.39)	
Bulgaria	N	bottom trawl	(2263.59)	(386.65)	
Bulgaria	N	dredge	(2222.77)	(338.42)	
Bulgaria	N	gillnet	(2412.41)	(461.02)	
Bulgaria	N	hand	(978.61)	(132.80)	
Bulgaria	N	hook and line	(2231.00)	(363.72)	
Bulgaria	N	midwater trawl	(493.14)	(126.82)	
Bulgaria	N	net	(581.84)	(72.58)	
Bulgaria	N	seine	(821.73)	(136.17)	
Bulgaria	N	shrimp trawl	(2550.25)	(420.94)	
Bulgaria	N	spear	(978.61)	(132.80)	
Bulgaria	N	trap	(1995.05)	(177.55)	
Cambodia	N	bottom trawl	(1071.52)	(192.76)	
Cambodia	N	dredge	(2092.03)	(317.27)	
Cambodia	N	hand	(978.61)	(132.80)	
Cambodia	N	hook and line	(1602.26)	(240.36)	
Cambodia	N	midwater trawl	(655.23)	(106.25)	
Cambodia	N	shrimp trawl	(1609.08)	(284.40)	
Cambodia	N	spear	(978.61)	(132.80)	
Cambodia	N	trap	(1363.80)	(325.39)	
Cameroon	N	bottom trawl	(1082.10)	(318.75)	
Cameroon	N	dredge	(1785.19)	(302.50)	
Cameroon	N	gillnet	(1019.85)	(338.18)	
Cameroon	N	hook and line	(1539.72)	(326.37)	
Cameroon	N	midwater trawl	(289.38)	(38.85)	
Cameroon	N	seine	(366.35)	(80.89)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Cameroon	N	shrimp trawl	(1871.74)	(384.45)	
Cameroon	N	trap	(1568.80)	(188.91)	
Canada	N	bottom trawl	(1372.24)	(149.96)	
Canada	N	dredge	(2642.48)	(223.11)	
Canada	N	gillnet	(890.13)	(251.79)	
Canada	N	hand	(978.61)	(132.80)	
Canada	N	hook and line	(2773.30)	(235.59)	
Canada	N	longline tuna	(2586.86)	(423.04)	
Canada	N	midwater trawl	(322.92)	(100.14)	
Canada	N	net	(391.54)	(61.73)	
Canada	N	pole line tuna	(978.61)	(132.80)	
Canada	N	purse seine tuna	(978.61)	(132.80)	
Canada	N	seine	(498.06)	(70.61)	
Canada	N	shrimp trawl	(1707.78)	(243.80)	
Canada	N	spear	(978.61)	(132.80)	
Canada	Y	trap	3,306.58	235.59	http://www.dfo-mpo.gc.ca/communic/statistics/publications/commercial/ces/annexa_e.htm; http://www.glf.dfo-mpo.gc.ca/pe/profil/lobster-homard/lobster-homard_2006-e.php
Cape Verde	N	bottom trawl	(1082.10)	(318.75)	
Cape Verde	N	gillnet	(1019.85)	(338.18)	
Cape Verde	N	hook and line	(1539.72)	(326.37)	
Cape Verde	N	longline tuna	(2006.76)	(449.60)	
Cape Verde	N	pole line tuna	(978.61)	(132.80)	
Cape Verde	N	purse seine tuna	(978.61)	(132.80)	
Cape Verde	N	seine	(366.35)	(80.89)	
Cape Verde	N	trap	(1568.80)	(188.91)	
Chile	N	bottom trawl	(461.12)	(124.63)	
Chile	N	dredge	(439.29)	(34.27)	
Chile	N	gillnet	(1204.09)	(29.27)	
Chile	N	hand	(978.61)	(132.80)	
Chile	N	hook and line	(1310.53)	(39.21)	
Chile	N	longline tuna	(482.40)	(54.59)	
Chile	N	midwater trawl	(542.28)	(74.37)	
Chile	N	pole line tuna	(978.61)	(132.80)	
Chile	N	purse seine tuna	(978.61)	(132.80)	
Chile	N	seine	(171.45)	(20.52)	
Chile	N	shrimp trawl	(927.31)	(137.16)	
Chile	N	spear	(978.61)	(132.80)	
Chile	Y	trap	608.65	114.02	Burgo-Ramos, 2001
China Main	Y	bottom trawl	1,293.67	229.94	http://www.fao.org/DOCREP/003/W9926E/W9926E00.HTM
China Main	N	dredge	(2092.03)	(317.27)	
China Main	N	gillnet	(489.92)	(291.78)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
China Main	N	hand	(978.61)	(132.80)	
China Main	N	hook and line	(1602.26)	(240.36)	
China Main	N	longline tuna	(2467.57)	(572.51)	
China Main	N	midwater trawl	(655.23)	(106.25)	
China Main	N	net	(360.64)	(65.21)	
China Main	N	pole line tuna	(978.61)	(132.80)	
China Main	N	purse seine tuna	(978.61)	(132.80)	
China Main	Y	seine	879.61	572.51	http://www.fao.org/DOCREP/003/W9926E/W9926E00.HTM
China Main	N	shrimp trawl	(1609.08)	(284.40)	
China Main	N	spear	(978.61)	(132.80)	
China Main	N	trap	(1363.80)	(325.39)	
Colombia	N	bottom trawl	(461.12)	(124.63)	
Colombia	N	dredge	(439.29)	(34.27)	
Colombia	N	gillnet	(1204.09)	(29.27)	
Colombia	N	hand	(978.61)	(132.80)	
Colombia	N	hook and line	(1310.53)	(39.21)	
Colombia	N	longline tuna	(482.40)	(54.59)	
Colombia	N	midwater trawl	(542.28)	(74.37)	
Colombia	N	pole line tuna	(978.61)	(132.80)	
Colombia	N	purse seine tuna	(978.61)	(132.80)	
Colombia	N	seine	(171.45)	(20.52)	
Colombia	N	shrimp trawl	(927.31)	(137.16)	
Colombia	N	spear	(978.61)	(132.80)	
Colombia	N	trammel	(409.69)	(17.86)	
Colombia	N	trap	(651.28)	(114.02)	
Comoros	N	bottom trawl	(1082.10)	(318.75)	
Comoros	N	gillnet	(1019.85)	(338.18)	
Comoros	N	hook and line	(1539.72)	(326.37)	
Comoros	N	longline tuna	(2006.76)	(449.60)	
Comoros	N	midwater trawl	(289.38)	(38.85)	
Comoros	N	pole line tuna	(978.61)	(132.80)	
Comoros	N	seine	(366.35)	(80.89)	
Comoros	N	shrimp trawl	(1871.74)	(384.45)	
Comoros	N	trap	(1568.80)	(188.91)	
Congo Dem Rep	N	bottom trawl	(1082.10)	(318.75)	
Congo Dem Rep	N	gillnet	(1019.85)	(338.18)	
Congo Dem Rep	N	hook and line	(1539.72)	(326.37)	
Congo Dem Rep	N	midwater trawl	(289.38)	(38.85)	
Congo Dem Rep	N	seine	(366.35)	(80.89)	
Congo Rep	N	bottom trawl	(1082.10)	(318.75)	
Congo Rep	N	gillnet	(1019.85)	(338.18)	
Congo Rep	N	hook and line	(1539.72)	(326.37)	
Congo Rep	N	liftnet	(916.35)	(132.80)	
Congo Rep	N	midwater trawl	(289.38)	(38.85)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Congo Rep	N	seine	(366.35)	(80.89)	
Congo Rep	N	shrimp trawl	(1871.74)	(384.45)	
Congo Rep	N	trap	(1568.80)	(188.91)	
Costa Rica	N	bottom trawl	(461.12)	(124.63)	
Costa Rica	N	dredge	(439.29)	(34.27)	
Costa Rica	N	gillnet	(1204.09)	(29.27)	
Costa Rica	N	hand	(978.61)	(132.80)	
Costa Rica	N	hook and line	(1310.53)	(39.21)	
Costa Rica	N	longline tuna	(482.40)	(54.59)	
Costa Rica	N	midwater trawl	(542.28)	(74.37)	
Costa Rica	N	pole line tuna	(978.61)	(132.80)	
Costa Rica	N	purse seine tuna	(978.61)	(132.80)	
Costa Rica	N	seine	(171.45)	(20.52)	
Costa Rica	N	shrimp trawl	(927.31)	(137.16)	
Costa Rica	N	spear	(978.61)	(132.80)	
Costa Rica	N	trap	(651.28)	(114.02)	
Cote d'Ivoire	N	bottom trawl	(1082.10)	(318.75)	
Cote d'Ivoire	N	dredge	(1785.19)	(302.50)	
Cote d'Ivoire	N	gillnet	(1019.85)	(338.18)	
Cote d'Ivoire	N	hook and line	(1539.72)	(326.37)	
Cote d'Ivoire	N	longline tuna	(2006.76)	(449.60)	
Cote d'Ivoire	N	midwater trawl	(289.38)	(38.85)	
Cote d'Ivoire	N	pole line tuna	(978.61)	(132.80)	
Cote d'Ivoire	N	purse seine tuna	(978.61)	(132.80)	
Cote d'Ivoire	N	seine	(366.35)	(80.89)	
Cote d'Ivoire	N	shrimp trawl	(1871.74)	(384.45)	
Cote d'Ivoire	N	trap	(1568.80)	(188.91)	
Croatia	N	bottom trawl	(2263.59)	(386.65)	
Croatia	N	dredge	(2222.77)	(338.42)	
Croatia	N	gillnet	(2412.41)	(461.02)	
Croatia	N	hand	(978.61)	(132.80)	
Croatia	N	hook and line	(2231.00)	(363.72)	
Croatia	N	longline tuna	(3813.03)	(663.89)	
Croatia	N	midwater trawl	(493.14)	(126.82)	
Croatia	N	pole line tuna	(978.61)	(132.80)	
Croatia	N	purse seine tuna	(978.61)	(132.80)	
Croatia	N	seine	(821.73)	(136.17)	
Croatia	N	spear	(978.61)	(132.80)	
Croatia	N	trap	(1995.05)	(177.55)	
Cuba	N	bottom trawl	(461.12)	(124.63)	
Cuba	N	dredge	(439.29)	(34.27)	
Cuba	N	gillnet	(1204.09)	(29.27)	
Cuba	N	hand	(978.61)	(132.80)	
Cuba	N	hook and line	(1310.53)	(39.21)	
Cuba	N	longline tuna	(482.40)	(54.59)	
Cuba	N	midwater trawl	(542.28)	(74.37)	
Cuba	N	pole line tuna	(978.61)	(132.80)	
Cuba	N	purse seine tuna	(978.61)	(132.80)	
Cuba	N	seine	(171.45)	(20.52)	
Cuba	N	shrimp trawl	(927.31)	(137.16)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Cuba	N	spear	(978.61)	(132.80)	
Cuba	N	trap	(651.28)	(114.02)	
Cyprus	N	bottom trawl	(2263.59)	(386.65)	
Cyprus	N	gillnet	(2412.41)	(461.02)	
Cyprus	N	hook and line	(2231.00)	(363.72)	
Cyprus	N	longline tuna	(3813.03)	(663.89)	
Cyprus	N	midwater trawl	(493.14)	(126.82)	
Cyprus	N	pole line tuna	(978.61)	(132.80)	
Cyprus	N	purse seine tuna	(978.61)	(132.80)	
Cyprus	N	seine	(821.73)	(136.17)	
Cyprus	N	shrimp trawl	(2550.25)	(420.94)	
Cyprus	N	spear	(978.61)	(132.80)	
Cyprus	N	trap	(1995.05)	(177.55)	
Denmark	Y	bottom trawl	253.32	54.95	European Commission, 2006
Denmark	N	dredge	(2222.77)	(338.42)	
Denmark	Y	gillnet	2,921.60	626.78	European Commission, 2006
Denmark	N	hand	(978.61)	(132.80)	
Denmark	N	hook and line	(2231.00)	(363.72)	
Denmark	N	midwater trawl	(493.14)	(126.82)	
Denmark	Y	seine	1,124.26	189.25	European Commission, 2006
Denmark	N	shrimp trawl	(2550.25)	(420.94)	
Denmark	N	spear	(978.61)	(132.80)	
Denmark	N	trammel	(3588.50)	(154.80)	
Denmark	N	trap	(1995.05)	(177.55)	
Djibouti	N	bottom trawl	(1082.10)	(318.75)	
Djibouti	N	gillnet	(1019.85)	(338.18)	
Djibouti	N	hook and line	(1539.72)	(326.37)	
Djibouti	N	midwater trawl	(289.38)	(38.85)	
Djibouti	N	seine	(366.35)	(80.89)	
Djibouti	N	trap	(1568.80)	(188.91)	
Dominica	N	bottom trawl	(461.12)	(124.63)	
Dominica	N	gillnet	(1204.09)	(29.27)	
Dominica	N	hook and line	(1310.53)	(39.21)	
Dominica	N	longline tuna	(482.40)	(54.59)	
Dominica	N	pole line tuna	(978.61)	(132.80)	
Dominica	N	purse seine tuna	(978.61)	(132.80)	
Dominica	N	seine	(171.45)	(20.52)	
Dominica	N	spear	(978.61)	(132.80)	
Dominica	N	trap	(651.28)	(114.02)	
Dominican Rp	N	bottom trawl	(461.12)	(124.63)	
Dominican Rp	N	dredge	(439.29)	(34.27)	
Dominican Rp	N	gillnet	(1204.09)	(29.27)	
Dominican Rp	N	hand	(978.61)	(132.80)	
Dominican Rp	N	hook and line	(1310.53)	(39.21)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Dominican Rp	N	longline tuna	(482.40)	(54.59)	
Dominican Rp	N	midwater trawl	(542.28)	(74.37)	
Dominican Rp	N	pole line tuna	(978.61)	(132.80)	
Dominican Rp	N	purse seine tuna	(978.61)	(132.80)	
Dominican Rp	N	seine	(171.45)	(20.52)	
Dominican Rp	N	shrimp trawl	(927.31)	(137.16)	
Dominican Rp	N	trammel	(409.69)	(17.86)	
Dominican Rp	N	trap	(651.28)	(114.02)	
Ecuador	N	bottom trawl	(461.12)	(124.63)	
Ecuador	N	dredge	(439.29)	(34.27)	
Ecuador	N	gillnet	(1204.09)	(29.27)	
Ecuador	N	hand	(978.61)	(132.80)	
Ecuador	N	hook and line	(1310.53)	(39.21)	
Ecuador	N	longline tuna	(482.40)	(54.59)	
Ecuador	N	midwater trawl	(542.28)	(74.37)	
Ecuador	N	pole line tuna	(978.61)	(132.80)	
Ecuador	N	purse seine tuna	(978.61)	(132.80)	
Ecuador	N	seine	(171.45)	(20.52)	
Ecuador	N	shrimp trawl	(927.31)	(137.16)	
Ecuador	N	spear	(978.61)	(132.80)	
Ecuador	N	trap	(651.28)	(114.02)	
Egypt	N	bottom trawl	(1082.10)	(318.75)	
Egypt	N	castnets	(978.61)	(132.80)	
Egypt	N	dredge	(1785.19)	(302.50)	
Egypt	N	gillnet	(1019.85)	(338.18)	
Egypt	N	hand	(978.61)	(132.80)	
Egypt	N	hook and line	(1539.72)	(326.37)	
Egypt	N	midwater trawl	(289.38)	(38.85)	
Egypt	N	net	(330.26)	(50.80)	
Egypt	N	pole line tuna	(978.61)	(132.80)	
Egypt	N	seine	(366.35)	(80.89)	
Egypt	N	shrimp trawl	(1871.74)	(384.45)	
Egypt	N	spear	(978.61)	(132.80)	
Egypt	N	trap	(1568.80)	(188.91)	
El Salvador	N	bottom trawl	(461.12)	(124.63)	
El Salvador	N	dredge	(439.29)	(34.27)	
El Salvador	N	gillnet	(1204.09)	(29.27)	
El Salvador	N	hand	(978.61)	(132.80)	
El Salvador	N	hook and line	(1310.53)	(39.21)	
El Salvador	N	midwater trawl	(542.28)	(74.37)	
El Salvador	N	purse seine tuna	(978.61)	(132.80)	
El Salvador	N	seine	(171.45)	(20.52)	
El Salvador	N	shrimp trawl	(927.31)	(137.16)	
El Salvador	N	spear	(978.61)	(132.80)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
El Salvador	N	trap	(651.28)	(114.02)	
Eq Guinea	N	bottom trawl	(1082.10)	(318.75)	
Eq Guinea	N	dredge	(1785.19)	(302.50)	
Eq Guinea	N	gillnet	(1019.85)	(338.18)	
Eq Guinea	N	hand	(978.61)	(132.80)	
Eq Guinea	N	hook and line	(1539.72)	(326.37)	
Eq Guinea	N	midwater trawl	(289.38)	(38.85)	
Eq Guinea	N	seine	(366.35)	(80.89)	
Eq Guinea	N	spear	(978.61)	(132.80)	
Eq Guinea	N	trap	(1568.80)	(188.91)	
Eritrea	N	bottom trawl	(1082.10)	(318.75)	
Eritrea	N	castnets	(978.61)	(132.80)	
Eritrea	N	gillnet	(1019.85)	(338.18)	
Eritrea	N	hand	(978.61)	(132.80)	
Eritrea	N	hook and line	(1539.72)	(326.37)	
Eritrea	N	midwater trawl	(289.38)	(38.85)	
Eritrea	N	net	(330.26)	(50.80)	
Eritrea	N	pole line tuna	(978.61)	(132.80)	
Eritrea	N	seine	(366.35)	(80.89)	
Eritrea	N	shrimp trawl	(1871.74)	(384.45)	
Eritrea	N	trap	(1568.80)	(188.91)	
Estonia	Y	bottom trawl	1,020.32	105.34	European Commission, 2006; http://www.fao.org/docrep/field/373973.htm
Estonia	N	gillnet	(2412.41)	(461.02)	
Estonia	N	hand	(978.61)	(132.80)	
Estonia	N	hook and line	(2231.00)	(363.72)	
Estonia	N	midwater trawl	(493.14)	(126.82)	
Estonia	N	seine	(821.73)	(136.17)	
Estonia	N	shrimp trawl	(2550.25)	(420.94)	
Estonia	N	trap	(1995.05)	(177.55)	
Fiji	N	bottom trawl	(1969.43)	(155.24)	
Fiji	N	dredge	(4098.19)	(369.62)	
Fiji	N	gillnet	(1342.82)	(309.85)	
Fiji	N	hand	(978.61)	(132.80)	
Fiji	N	hook and line	(4279.31)	(696.52)	
Fiji	N	liftnet	(2106.56)	(132.80)	
Fiji	N	longline tuna	(4871.04)	(679.38)	
Fiji	N	midwater trawl	(642.54)	(104.69)	
Fiji	N	pole line tuna	(978.61)	(132.80)	
Fiji	N	purse seine tuna	(978.61)	(132.80)	
Fiji	N	seine	(1160.16)	(89.56)	
Fiji	N	spear	(978.61)	(132.80)	
Fiji	N	trap	(4460.19)	(513.25)	
Finland	Y	bottom trawl	615.64	52.77	European Commission, 2006
Finland	Y	gillnet	2,159.42	537.31	European Commission, 2006
Finland	N	hook and line	(2231.00)	(363.72)	
Finland	N	midwater trawl	(493.14)	(126.82)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Finland	N	seine	(821.73)	(136.17)	
Finland	N	trap	(1995.05)	(177.55)	
France	Y	bottom trawl	2,235.23	415.76	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
France	Y	dredge	2,261.64	316.74	European Commission, 2006
France	Y	gillnet	3,120.69	616.18	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
France	N	hand	(978.61)	(132.80)	
France	Y	hook and line	2,673.10	399.55	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
France	N	longline tuna	(3813.03)	(663.89)	
France	N	midwater trawl	(1371.81)	(204.80)	
France	N	pole line tuna	(978.61)	(132.80)	
France	N	purse seine tuna	(978.61)	(132.80)	
France	N	seine	(718.89)	(76.66)	
France	N	shrimp trawl	(2550.25)	(420.94)	
France	N	spear	(978.61)	(132.80)	
France	N	trammel	(3588.50)	(154.80)	
France	Y	trap	1,995.05	177.55	European Commission, 2006
Gabon	N	bottom trawl	(1082.10)	(318.75)	
Gabon	N	gillnet	(1019.85)	(338.18)	
Gabon	N	hook and line	(1539.72)	(326.37)	
Gabon	N	longline tuna	(2006.76)	(449.60)	
Gabon	N	midwater trawl	(289.38)	(38.85)	
Gabon	N	pole line tuna	(978.61)	(132.80)	
Gabon	N	purse seine tuna	(978.61)	(132.80)	
Gabon	N	seine	(366.35)	(80.89)	
Gabon	N	shrimp trawl	(1871.74)	(384.45)	
Gabon	N	trap	(1568.80)	(188.91)	
Gambia	N	bottom trawl	(1082.10)	(318.75)	
Gambia	N	dredge	(1785.19)	(302.50)	
Gambia	N	gillnet	(1019.85)	(338.18)	
Gambia	N	hand	(978.61)	(132.80)	
Gambia	N	hook and line	(1539.72)	(326.37)	
Gambia	N	midwater trawl	(289.38)	(38.85)	
Gambia	N	seine	(366.35)	(80.89)	
Gambia	N	shrimp trawl	(1871.74)	(384.45)	
Gambia	N	spear	(978.61)	(132.80)	
Gambia	N	trap	(1568.80)	(188.91)	
Georgia	N	bottom trawl	(2263.59)	(386.65)	
Georgia	N	gillnet	(2412.41)	(461.02)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Georgia	N	hand	(978.61)	(132.80)	
Georgia	N	hook and line	(2231.00)	(363.72)	
Georgia	N	midwater trawl	(493.14)	(126.82)	
Georgia	N	seine	(821.73)	(136.17)	
Germany	Y	bottom trawl	1,507.79	314.17	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Germany	N	dredge	(2222.77)	(338.42)	
Germany	N	gillnet	(2412.41)	(461.02)	
Germany	N	hand	(978.61)	(132.80)	
Germany	N	hook and line	(2231.00)	(363.72)	
Germany	N	longline tuna	(3813.03)	(663.89)	
Germany	Y	midwater trawl	434.48	123.55	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Germany	N	seine	(821.73)	(136.17)	
Germany	N	shrimp trawl	(2550.25)	(420.94)	
Germany	N	spear	(978.61)	(132.80)	
Germany	N	trammel	(3588.50)	(154.80)	
Germany	N	trap	(1995.05)	(177.55)	
Ghana	N	bottom trawl	(1082.10)	(318.75)	
Ghana	N	gillnet	(1542.51)	(403.43)	
Ghana	N	hand	(978.61)	(132.80)	
Ghana	Y	hook and line	1,923.13	519.71	ftp://ftp.fao.org/docrep/fao/006/ad427e/ad427e00.pdf
Ghana	N	longline tuna	(2006.76)	(449.60)	
Ghana	N	midwater trawl	(1029.65)	(423.09)	
Ghana	N	pole line tuna	(978.61)	(132.80)	
Ghana	N	purse seine tuna	(978.61)	(132.80)	
Ghana	Y	seine	531.92	184.93	ftp://ftp.fao.org/docrep/fao/006/ad427e/ad427e00.pdf; Brotier-verstraaten, 2002
Ghana	N	shrimp trawl	(1871.74)	(384.45)	
Ghana	N	trammel	(1625.09)	(117.69)	
Ghana	N	trap	(1568.80)	(188.91)	
Greece	Y	bottom trawl	3,774.93	612.23	European Commission, 2006
Greece	N	dredge	(2222.77)	(338.42)	
Greece	N	gillnet	(2412.41)	(461.02)	
Greece	N	hand	(978.61)	(132.80)	
Greece	N	hook and line	(2231.00)	(363.72)	
Greece	N	longline tuna	(3813.03)	(663.89)	
Greece	N	midwater trawl	(493.14)	(126.82)	
Greece	N	pole line tuna	(978.61)	(132.80)	
Greece	N	purse seine tuna	(978.61)	(132.80)	
Greece	N	seine	(821.73)	(136.17)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Greece	N	shrimp trawl	(2550.25)	(420.94)	
Greece	N	spear	(978.61)	(132.80)	
Greece	N	trammel	(3588.50)	(154.80)	
Greece	N	trap	(1995.05)	(177.55)	
Grenada	N	bottom trawl	(461.12)	(124.63)	
Grenada	N	dredge	(439.29)	(34.27)	
Grenada	N	gillnet	(1204.09)	(29.27)	
Grenada	N	hand	(978.61)	(132.80)	
Grenada	N	hook and line	(1310.53)	(39.21)	
Grenada	N	longline tuna	(482.40)	(54.59)	
Grenada	N	midwater trawl	(542.28)	(74.37)	
Grenada	N	pole line tuna	(978.61)	(132.80)	
Grenada	N	purse seine tuna	(978.61)	(132.80)	
Grenada	N	seine	(171.45)	(20.52)	
Grenada	N	spear	(978.61)	(132.80)	
Grenada	N	trap	(651.28)	(114.02)	
Guatemala	N	bottom trawl	(461.12)	(124.63)	
Guatemala	N	gillnet	(1204.09)	(29.27)	
Guatemala	N	hook and line	(1310.53)	(39.21)	
Guatemala	N	longline tuna	(482.40)	(54.59)	
Guatemala	N	midwater trawl	(542.28)	(74.37)	
Guatemala	N	pole line tuna	(978.61)	(132.80)	
Guatemala	N	purse seine tuna	(978.61)	(132.80)	
Guatemala	N	seine	(171.45)	(20.52)	
Guatemala	N	shrimp trawl	(927.31)	(137.16)	
Guatemala	N	trap	(651.28)	(114.02)	
Guinea	N	bottom trawl	(1082.10)	(318.75)	
Guinea	N	gillnet	(1019.85)	(338.18)	
Guinea	N	hook and line	(1539.72)	(326.37)	
Guinea	N	longline tuna	(2006.76)	(449.60)	
Guinea	N	midwater trawl	(289.38)	(38.85)	
Guinea	N	pole line tuna	(978.61)	(132.80)	
Guinea	N	seine	(366.35)	(80.89)	
Guinea	N	trap	(1568.80)	(188.91)	
GuineaBissau	N	bottom trawl	(1082.10)	(318.75)	
GuineaBissau	N	gillnet	(1019.85)	(338.18)	
GuineaBissau	N	hook and line	(1539.72)	(326.37)	
GuineaBissau	N	midwater trawl	(289.38)	(38.85)	
GuineaBissau	N	seine	(366.35)	(80.89)	
GuineaBissau	N	shrimp trawl	(1871.74)	(384.45)	
GuineaBissau	N	trap	(1568.80)	(188.91)	
Guyana	N	bottom trawl	(461.12)	(124.63)	
Guyana	N	gillnet	(1204.09)	(29.27)	
Guyana	N	hook and line	(1310.53)	(39.21)	
Guyana	N	seine	(171.45)	(20.52)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Guyana	N	shrimp trawl	(927.31)	(137.16)	
Guyana	N	trap	(651.28)	(114.02)	
Haiti	N	bottom trawl	(461.12)	(124.63)	
Haiti	N	dredge	(439.29)	(34.27)	
Haiti	N	hand	(978.61)	(132.80)	
Haiti	N	shrimp trawl	(927.31)	(137.16)	
Haiti	N	spear	(978.61)	(132.80)	
Haiti	N	trap	(651.28)	(114.02)	
Honduras	N	bottom trawl	(461.12)	(124.63)	
Honduras	N	dredge	(439.29)	(34.27)	
Honduras	N	gillnet	(1204.09)	(29.27)	
Honduras	N	hand	(978.61)	(132.80)	
Honduras	N	longline tuna	(482.40)	(54.59)	
Honduras	N	pole line tuna	(978.61)	(132.80)	
Honduras	N	purse seine tuna	(978.61)	(132.80)	
Honduras	N	shrimp trawl	(927.31)	(137.16)	
Honduras	N	spear	(978.61)	(132.80)	
Honduras	N	trap	(651.28)	(114.02)	
Hong Kong	N	bottom trawl	(1071.52)	(192.76)	
Hong Kong	N	dredge	(2092.03)	(317.27)	
Hong Kong	N	gillnet	(489.92)	(291.78)	
Hong Kong	N	hook and line	(1602.26)	(240.36)	
Hong Kong	N	midwater trawl	(655.23)	(106.25)	
Hong Kong	N	seine	(942.33)	(259.16)	
Hong Kong	N	shrimp trawl	(1609.08)	(284.40)	
Hong Kong	N	trap	(1363.80)	(325.39)	
Iceland	Y	bottom trawl	1,131.97	295.08	European Commission, 2006
Iceland	N	dredge	(2222.77)	(338.42)	
Iceland	N	gillnet	(2412.41)	(461.02)	
Iceland	N	hand	(978.61)	(132.80)	
Iceland	Y	hook and line	1,752.72	347.33	European Commission, 2006
Iceland	Y	midwater trawl	770.61	202.86	European Commission, 2006
Iceland	N	seine	(821.73)	(136.17)	
Iceland	N	shrimp trawl	(2550.25)	(420.94)	
Iceland	N	trammel	(3588.50)	(154.80)	
Iceland	N	trap	(1995.05)	(177.55)	
India	Y	bottom trawl	734.18	212.87	http://www.fao.org/docrep/008/y6982e/y6982e00.htm; ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf
India	N	castnets	(978.61)	(132.80)	
India	N	dredge	(2092.03)	(317.27)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
India	Y	gillnet	276.27	294.58	http://www.fao.org/docrep/007/ae453e/ae453e00.htm; http://www.fao.org/DOCREP/007/AD838E/AD838E00.HTM; http://www.fao.org/docrep/007/ae460e/ae460e00.htm
India	N	hand	(978.61)	(132.80)	
India	Y	hook and line	1,240.94	435.72	http://www.fao.org/docrep/008/y6982e/y6982e00.htm; http://www.fao.org/docrep/007/ae453e/ae453e00.htm; ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf
India	N	liftnet	(1086.93)	(132.80)	
India	N	longline tuna	(2467.57)	(572.51)	
India	N	midwater trawl	(655.23)	(106.25)	
India	Y	net	171.27	61.34	Sehara *et al*., 1987
India	N	pole line tuna	(978.61)	(132.80)	
India	Y	seine	236.87	100.13	http://www.fao.org/docrep/008/y6982e/y6982e00.htm; ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf
India	N	shrimp trawl	(1609.08)	(284.40)	
India	N	spear	(978.61)	(132.80)	
India	N	trammel	(1992.26)	(129.08)	
India	N	trap	(1363.80)	(325.39)	
Indonesia	N	bomb/chemical	(978.61)	(132.80)	
Indonesia	N	bottom trawl	(1071.52)	(192.76)	
Indonesia	N	castnets	(978.61)	(132.80)	
Indonesia	N	dredge	(2092.03)	(317.27)	
Indonesia	Y	gillnet	898.85	273.97	
Indonesia	N	hand	(978.61)	(132.80)	
Indonesia	N	hook and line	(831.16)	(200.99)	
Indonesia	N	liftnet	(1086.93)	(132.80)	
Indonesia	Y	longline tuna	3,616.30	572.51	
Indonesia	N	midwater trawl	(655.23)	(106.25)	
Indonesia	N	net	(360.64)	(65.21)	
Indonesia	N	pole line tuna	(978.61)	(132.80)	
Indonesia	N	purse seine tuna	(978.61)	(132.80)	
Indonesia	Y	seine	767.42	244.19	
Indonesia	N	shrimp trawl	(1609.08)	(284.40)	
Indonesia	N	spear	(978.61)	(132.80)	
Indonesia	N	trammel	(1992.26)	(129.08)	
Indonesia	N	trap	(1363.80)	(325.39)	
Iran	N	bottom trawl	(1071.52)	(192.76)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Iran	N	castnets	(978.61)	(132.80)	
Iran	N	gillnet	(489.92)	(291.78)	
Iran	N	hand	(978.61)	(132.80)	
Iran	N	hook and line	(1602.26)	(240.36)	
Iran	N	liftnet	(1086.93)	(132.80)	
Iran	N	longline tuna	(2467.57)	(572.51)	
Iran	N	midwater trawl	(655.23)	(106.25)	
Iran	N	net	(360.64)	(65.21)	
Iran	N	pole line tuna	(978.61)	(132.80)	
Iran	N	seine	(942.33)	(259.16)	
Iran	N	shrimp trawl	(1609.08)	(284.40)	
Iran	N	spear	(978.61)	(132.80)	
Iran	N	trammel	(1992.26)	(129.08)	
Iran	N	trap	(1363.80)	(325.39)	
Ireland	N	bottom trawl	(2263.59)	(386.65)	
Ireland	N	dredge	(2222.77)	(338.42)	
Ireland	N	gillnet	(2412.41)	(461.02)	
Ireland	N	hand	(978.61)	(132.80)	
Ireland	N	hook and line	(2231.00)	(363.72)	
Ireland	N	longline tuna	(3813.03)	(663.89)	
Ireland	N	midwater trawl	(493.14)	(126.82)	
Ireland	N	pole line tuna	(978.61)	(132.80)	
Ireland	N	purse seine tuna	(978.61)	(132.80)	
Ireland	N	seine	(821.73)	(136.17)	
Ireland	N	shrimp trawl	(2550.25)	(420.94)	
Ireland	N	spear	(978.61)	(132.80)	
Ireland	N	trammel	(3588.50)	(154.80)	
Ireland	N	trap	(1995.05)	(177.55)	
Israel	N	bottom trawl	(1071.52)	(192.76)	
Israel	N	gillnet	(489.92)	(291.78)	
Israel	N	hook and line	(1602.26)	(240.36)	
Israel	N	midwater trawl	(655.23)	(106.25)	
Israel	N	net	(360.64)	(65.21)	
Israel	N	seine	(942.33)	(259.16)	
Israel	N	shrimp trawl	(1609.08)	(284.40)	
Italy	Y	bottom trawl	4,343.68	560.28	European Commission, 2006
Italy	Y	dredge	2,152.20	377.77	European Commission, 2006
Italy	Y	gillnet	3,949.69	440.67	European Commission, 2006
Italy	N	hand	(978.61)	(132.80)	
Italy	N	hook and line	(2231.00)	(363.72)	
Italy	N	longline tuna	(3813.03)	(663.89)	
Italy	Y	midwater trawl	945.17	99.94	European Commission, 2006
Italy	N	pole line tuna	(978.61)	(132.80)	
Italy	N	purse seine tuna	(978.61)	(132.80)	
Italy	Y	seine	2,082.66	215.58	European Commission, 2006
Italy	N	shrimp trawl	(2550.25)	(420.94)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Italy	N	spear	(978.61)	(132.80)	
Italy	N	trammel	(3588.50)	(154.80)	
Italy	N	trap	(1995.05)	(177.55)	
Jamaica	N	bottom trawl	(461.12)	(124.63)	
Jamaica	N	dredge	(439.29)	(34.27)	
Jamaica	N	hand	(978.61)	(132.80)	
Jamaica	N	spear	(978.61)	(132.80)	
Jamaica	N	trap	(651.28)	(114.02)	
Japan	Y	bottom trawl	2,284.95	358.64	Ministry of Agriculture, Forestry and Fisheries. Statistics Department. Tokyo, 2007
Japan	N	dredge	(2092.03)	(317.27)	
Japan	N	gillnet	(489.92)	(291.78)	
Japan	N	hand	(978.61)	(132.80)	
Japan	Y	hook and line	2,683.33	284.74	Ministry of Agriculture, Forestry and Fisheries. Statistics Department. Tokyo, 2007
Japan	N	longline tuna	(2467.57)	(572.51)	
Japan	N	midwater trawl	(655.23)	(106.25)	
Japan	N	net	(360.64)	(65.21)	
Japan	N	pole line tuna	(978.61)	(132.80)	
Japan	N	purse seine tuna	(978.61)	(132.80)	
Japan	Y	seine	1,691.04	273.68	Ministry of Agriculture, Forestry and Fisheries. Statistics Department. Tokyo, 2007
Japan	N	shrimp trawl	(1609.08)	(284.40)	
Japan	N	spear	(978.61)	(132.80)	
Japan	N	trammel	(1992.26)	(129.08)	
Japan	N	trap	(1363.80)	(325.39)	
Jordan	N	bottom trawl	(1071.52)	(192.76)	
Jordan	N	gillnet	(489.92)	(291.78)	
Jordan	N	hook and line	(1602.26)	(240.36)	
Jordan	N	midwater trawl	(655.23)	(106.25)	
Jordan	N	pole line tuna	(978.61)	(132.80)	
Jordan	N	seine	(942.33)	(259.16)	
Jordan	N	trap	(1363.80)	(325.39)	
Kenya	N	bottom trawl	(1082.10)	(318.75)	
Kenya	N	dredge	(1785.19)	(302.50)	
Kenya	N	gillnet	(1019.85)	(338.18)	
Kenya	N	hand	(978.61)	(132.80)	
Kenya	N	hook and line	(1539.72)	(326.37)	
Kenya	N	midwater trawl	(289.38)	(38.85)	
Kenya	N	pole line tuna	(978.61)	(132.80)	
Kenya	N	seine	(366.35)	(80.89)	
Kenya	N	shrimp trawl	(1871.74)	(384.45)	
Kenya	N	spear	(978.61)	(132.80)	
Kenya	N	trammel	(1625.09)	(117.69)	
Kenya	N	trap	(1568.80)	(188.91)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Kiribati	N	bottom trawl	(1969.43)	(155.24)	
Kiribati	N	dredge	(4098.19)	(369.62)	
Kiribati	N	gillnet	(1342.82)	(309.85)	
Kiribati	N	hand	(978.61)	(132.80)	
Kiribati	N	hook and line	(4279.31)	(696.52)	
Kiribati	N	longline tuna	(4871.04)	(679.38)	
Kiribati	N	midwater trawl	(642.54)	(104.69)	
Kiribati	N	pole line tuna	(978.61)	(132.80)	
Kiribati	N	purse seine tuna	(978.61)	(132.80)	
Kiribati	N	seine	(1160.16)	(89.56)	
Kiribati	N	spear	(978.61)	(132.80)	
Kiribati	N	trap	(4460.19)	(513.25)	
Korea Rep	Y	bottom trawl	1,534.05	166.09	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Korea Rep	N	dredge	(2092.03)	(317.27)	
Korea Rep	Y	gillnet	1,080.85	176.39	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Korea Rep	N	hand	(978.61)	(132.80)	
Korea Rep	Y	hook and line	2,072.55	226.03	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Korea Rep	N	longline tuna	(2467.57)	(572.51)	
Korea Rep	Y	midwater trawl	1,276.32	161.22	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Korea Rep	Y	net	745.96	78.15	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Korea Rep	N	pole line tuna	(978.61)	(132.80)	
Korea Rep	N	purse seine tuna	(978.61)	(132.80)	
Korea Rep	Y	seine	1,421.29	205.43	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Korea Rep	N	shrimp trawl	(1609.08)	(284.40)	
Korea Rep	N	spear	(978.61)	(132.80)	
Korea Rep	N	trammel	(1992.26)	(129.08)	
Korea Rep	N	trap	(1363.80)	(325.39)	
Kuwait	N	bottom trawl	(1071.52)	(192.76)	
Kuwait	N	gillnet	(489.92)	(291.78)	
Kuwait	N	hook and line	(1602.26)	(240.36)	
Kuwait	N	midwater trawl	(655.23)	(106.25)	
Kuwait	N	net	(360.64)	(65.21)	
Kuwait	N	seine	(942.33)	(259.16)	
Kuwait	N	shrimp trawl	(1609.08)	(284.40)	
Kuwait	N	trap	(1363.80)	(325.39)	
Latvia	Y	bottom trawl	300.55	78.71	European Commission, 2006
Latvia	Y	gillnet	1,634.55	322.15	European Commission, 2006
Latvia	N	hand	(978.61)	(132.80)	
Latvia	N	hook and line	(2231.00)	(363.72)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Latvia	N	longline tuna	(3813.03)	(663.89)	
Latvia	N	midwater trawl	(493.14)	(126.82)	
Latvia	N	pole line tuna	(978.61)	(132.80)	
Latvia	N	purse seine tuna	(978.61)	(132.80)	
Latvia	N	seine	(821.73)	(136.17)	
Latvia	N	shrimp trawl	(2550.25)	(420.94)	
Latvia	N	trap	(1995.05)	(177.55)	
Lebanon	N	bottom trawl	(1071.52)	(192.76)	
Lebanon	N	gillnet	(489.92)	(291.78)	
Lebanon	N	hook and line	(1602.26)	(240.36)	
Lebanon	N	midwater trawl	(655.23)	(106.25)	
Lebanon	N	seine	(942.33)	(259.16)	
Lebanon	N	trap	(1363.80)	(325.39)	
Liberia	N	bottom trawl	(1082.10)	(318.75)	
Liberia	N	gillnet	(1019.85)	(338.18)	
Liberia	N	hand	(978.61)	(132.80)	
Liberia	N	hook and line	(1539.72)	(326.37)	
Liberia	N	longline tuna	(2006.76)	(449.60)	
Liberia	N	midwater trawl	(289.38)	(38.85)	
Liberia	N	pole line tuna	(978.61)	(132.80)	
Liberia	N	purse seine tuna	(978.61)	(132.80)	
Liberia	N	seine	(366.35)	(80.89)	
Liberia	N	shrimp trawl	(1871.74)	(384.45)	
Liberia	N	trap	(1568.80)	(188.91)	
Libya	N	bottom trawl	(1082.10)	(318.75)	
Libya	N	gillnet	(1019.85)	(338.18)	
Libya	N	hook and line	(1539.72)	(326.37)	
Libya	N	longline tuna	(2006.76)	(449.60)	
Libya	N	midwater trawl	(289.38)	(38.85)	
Libya	N	pole line tuna	(978.61)	(132.80)	
Libya	N	purse seine tuna	(978.61)	(132.80)	
Libya	N	seine	(366.35)	(80.89)	
Lithuania	Y	bottom trawl	558.86	82.99	European Commission, 2006
Lithuania	Y	gillnet	1,137.24	216.89	European Commission, 2006
Lithuania	N	hook and line	(2231.00)	(363.72)	
Lithuania	N	longline tuna	(3813.03)	(663.89)	
Lithuania	N	midwater trawl	(493.14)	(126.82)	
Lithuania	N	pole line tuna	(978.61)	(132.80)	
Lithuania	N	purse seine tuna	(978.61)	(132.80)	
Lithuania	N	seine	(821.73)	(136.17)	
Lithuania	N	shrimp trawl	(2550.25)	(420.94)	
Lithuania	N	trammel	(3588.50)	(154.80)	
Lithuania	N	trap	(1995.05)	(177.55)	
Madagascar	N	bottom trawl	(1082.10)	(318.75)	
Madagascar	N	dredge	(1785.19)	(302.50)	
Madagascar	N	hand	(978.61)	(132.80)	
Madagascar	N	hook and line	(1539.72)	(326.37)	
Madagascar	N	shrimp trawl	(1871.74)	(384.45)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Madagascar	N	spear	(978.61)	(132.80)	
Madagascar	N	trap	(1568.80)	(188.91)	
Malaysia	Y	bottom trawl	578.05	147.55	ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf
Malaysia	N	dredge	(2092.03)	(317.27)	
Malaysia	Y	gillnet	1,014.46	346.77	ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf; Abu Talib et al., 2003
Malaysia	N	hand	(978.61)	(132.80)	
Malaysia	Y	hook and line	1,422.78	362.10	ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf
Malaysia	N	liftnet	(1086.93)	(132.80)	
Malaysia	N	longline tuna	(2467.57)	(572.51)	
Malaysia	Y	midwater trawl	336.56	80.31	
Malaysia	N	net	(360.64)	(65.21)	
Malaysia	N	pole line tuna	(978.61)	(132.80)	
Malaysia	N	purse seine tuna	(978.61)	(132.80)	
Malaysia	Y	seine	443.61	53.84	ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf; Abu Talib et al., 2003
Malaysia	N	shrimp trawl	(1609.08)	(284.40)	
Malaysia	N	spear	(978.61)	(132.80)	
Malaysia	N	trammel	(1992.26)	(129.08)	
Malaysia	Y	trap	803.29	325.39	ftp://ftp.fao.org/docrep/fao/008/y6982e/y6982e00.pdf
Maldives	N	bottom trawl	(1082.10)	(318.75)	
Maldives	N	dredge	(1785.19)	(302.50)	
Maldives	N	gillnet	(1019.85)	(338.18)	
Maldives	N	hand	(978.61)	(132.80)	
Maldives	N	hook and line	(1539.72)	(326.37)	
Maldives	N	longline tuna	(2006.76)	(449.60)	
Maldives	N	pole line tuna	(978.61)	(132.80)	
Maldives	N	seine	(366.35)	(80.89)	
Maldives	N	spear	(978.61)	(132.80)	
Malta	N	bottom trawl	(2263.59)	(386.65)	
Malta	N	gillnet	(2412.41)	(461.02)	
Malta	N	hook and line	(2231.00)	(363.72)	
Malta	N	longline tuna	(3813.03)	(663.89)	
Malta	N	midwater trawl	(493.14)	(126.82)	
Malta	N	pole line tuna	(978.61)	(132.80)	
Malta	N	purse seine tuna	(978.61)	(132.80)	
Malta	N	seine	(821.73)	(136.17)	
Malta	N	shrimp trawl	(2550.25)	(420.94)	
Malta	N	spear	(978.61)	(132.80)	
Malta	N	trap	(1995.05)	(177.55)	
Marshall Is	N	bottom trawl	(1969.43)	(155.24)	
Marshall Is	N	gillnet	(1342.82)	(309.85)	

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Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Marshall Is	N	hook and line	(4279.31)	(696.52)	
Marshall Is	N	longline tuna	(4871.04)	(679.38)	
Marshall Is	N	pole line tuna	(978.61)	(132.80)	
Marshall Is	N	purse seine tuna	(978.61)	(132.80)	
Mauritania	N	bottom trawl	(1082.10)	(318.75)	
Mauritania	N	gillnet	(1019.85)	(338.18)	
Mauritania	N	hook and line	(1539.72)	(326.37)	
Mauritania	N	midwater trawl	(289.38)	(38.85)	
Mauritania	N	seine	(366.35)	(80.89)	
Mauritania	N	shrimp trawl	(1871.74)	(384.45)	
Mauritania	N	trammel	(1625.09)	(117.69)	
Mauritania	N	trap	(1568.80)	(188.91)	
Mauritius	N	bottom trawl	(1082.10)	(318.75)	
Mauritius	N	gillnet	(1019.85)	(338.18)	
Mauritius	N	hook and line	(1539.72)	(326.37)	
Mauritius	N	longline tuna	(2006.76)	(449.60)	
Mauritius	N	midwater trawl	(289.38)	(38.85)	
Mauritius	N	pole line tuna	(978.61)	(132.80)	
Mauritius	N	seine	(366.35)	(80.89)	
Mauritius	N	shrimp trawl	(1871.74)	(384.45)	
Mauritius	N	trap	(1568.80)	(188.91)	
Mexico	N	bottom trawl	(1372.24)	(149.96)	
Mexico	N	castnets	(978.61)	(132.80)	
Mexico	N	dredge	(2642.48)	(223.11)	
Mexico	N	gillnet	(890.13)	(251.79)	
Mexico	N	hand	(978.61)	(132.80)	
Mexico	N	hook and line	(2773.30)	(235.59)	
Mexico	N	longline tuna	(2586.86)	(423.04)	
Mexico	N	midwater trawl	(322.92)	(100.14)	
Mexico	N	pole line tuna	(978.61)	(132.80)	
Mexico	N	purse seine tuna	(978.61)	(132.80)	
Mexico	N	seine	(498.06)	(70.61)	
Mexico	N	shrimp trawl	(1707.78)	(243.80)	
Mexico	N	spear	(978.61)	(132.80)	
Mexico	N	trammel	(2296.05)	(205.78)	
Mexico	N	trap	(3306.58)	(235.59)	
Micronesia	N	bottom trawl	(1969.43)	(155.24)	
Micronesia	N	gillnet	(1342.82)	(309.85)	
Micronesia	N	hook and line	(4279.31)	(696.52)	
Micronesia	N	longline tuna	(4871.04)	(679.38)	
Micronesia	N	midwater trawl	(642.54)	(104.69)	
Micronesia	N	pole line tuna	(978.61)	(132.80)	
Micronesia	N	purse seine tuna	(978.61)	(132.80)	
Micronesia	N	trap	(4460.19)	(513.25)	
Morocco	N	bottom trawl	(1082.10)	(318.75)	
Morocco	N	dredge	(1785.19)	(302.50)	
Morocco	N	gillnet	(1019.85)	(338.18)	
Morocco	N	hand	(978.61)	(132.80)	
Morocco	N	hook and line	(1539.72)	(326.37)	
Morocco	N	longline tuna	(2006.76)	(449.60)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Morocco	N	midwater trawl	(289.38)	(38.85)	
Morocco	N	pole line tuna	(978.61)	(132.80)	
Morocco	N	purse seine tuna	(978.61)	(132.80)	
Morocco	N	seine	(366.35)	(80.89)	
Morocco	N	shrimp trawl	(1871.74)	(384.45)	
Morocco	N	spear	(978.61)	(132.80)	
Morocco	N	trammel	(1625.09)	(117.69)	
Morocco	N	trap	(1568.80)	(188.91)	
Mozambique	N	bottom trawl	(1082.10)	(318.75)	
Mozambique	N	dredge	(1785.19)	(302.50)	
Mozambique	N	hand	(978.61)	(132.80)	
Mozambique	N	shrimp trawl	(1871.74)	(384.45)	
Mozambique	N	spear	(978.61)	(132.80)	
Mozambique	N	trap	(1568.80)	(188.91)	
Myanmar	N	bottom trawl	(1071.52)	(192.76)	
Myanmar	N	gillnet	(489.92)	(291.78)	
Myanmar	N	hook and line	(1602.26)	(240.36)	
Myanmar	N	shrimp trawl	(1609.08)	(284.40)	
Namibia	N	bottom trawl	(1082.10)	(318.75)	
Namibia	N	gillnet	(1019.85)	(338.18)	
Namibia	Y	hook and line	376.38	46.30	Ministry of Fisheries and Marine Resources, Republic of Namibia, 1999
Namibia	N	longline tuna	(2006.76)	(449.60)	
Namibia	Y	midwater trawl	257.87	22.50	Ministry of Fisheries and Marine Resources, Republic of Namibia, 1999
Namibia	N	pole line tuna	(978.61)	(132.80)	
Namibia	N	purse seine tuna	(978.61)	(132.80)	
Namibia	Y	seine	660.54	141.73	Ministry of Fisheries and Marine Resources, Republic of Namibia, 1999
Namibia	Y	trap	1,568.80	188.91	Ministry of Fisheries and Marine Resources, Republic of Namibia, 1999
Nauru	N	bottom trawl	(1969.43)	(155.24)	
Nauru	N	gillnet	(1342.82)	(309.85)	
Nauru	N	hook and line	(4279.31)	(696.52)	
Nauru	N	longline tuna	(4871.04)	(679.38)	
Nauru	N	midwater trawl	(642.54)	(104.69)	
Nauru	N	pole line tuna	(978.61)	(132.80)	
Nauru	N	purse seine tuna	(978.61)	(132.80)	
Nauru	N	seine	(1160.16)	(89.56)	
Nauru	N	trap	(4460.19)	(513.25)	
Netherlands	Y	bottom trawl	2,882.70	514.33	European Commission, 2006
Netherlands	N	dredge	(2222.77)	(338.42)	
Netherlands	N	gillnet	(2412.41)	(461.02)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Netherlands	N	hand	(978.61)	(132.80)	
Netherlands	N	hook and line	(2231.00)	(363.72)	
Netherlands	N	longline tuna	(3813.03)	(663.89)	
Netherlands	N	midwater trawl	(493.14)	(126.82)	
Netherlands	N	pole line tuna	(978.61)	(132.80)	
Netherlands	N	purse seine tuna	(978.61)	(132.80)	
Netherlands	N	seine	(821.73)	(136.17)	
Netherlands	N	shrimp trawl	(2550.25)	(420.94)	
Netherlands	N	spear	(978.61)	(132.80)	
Netherlands	N	trammel	(3588.50)	(154.80)	
Netherlands	N	trap	(1995.05)	(177.55)	
New Zealand	N	bottom trawl	(1969.43)	(155.24)	
New Zealand	N	dredge	(4098.19)	(369.62)	
New Zealand	N	gillnet	(1342.82)	(309.85)	
New Zealand	N	hand	(978.61)	(132.80)	
New Zealand	N	hook and line	(4279.31)	(696.52)	
New Zealand	N	longline tuna	(4871.04)	(679.38)	
New Zealand	N	midwater trawl	(642.54)	(104.69)	
New Zealand	N	pole line tuna	(978.61)	(132.80)	
New Zealand	N	purse seine tuna	(978.61)	(132.80)	
New Zealand	N	seine	(1160.16)	(89.56)	
New Zealand	N	shrimp trawl	(4364.20)	(674.00)	
New Zealand	N	spear	(978.61)	(132.80)	
New Zealand	N	trammel	(3731.19)	(125.74)	
New Zealand	N	trap	(4460.19)	(513.25)	
Nicaragua	N	bottom trawl	(461.12)	(124.63)	
Nicaragua	N	dredge	(439.29)	(34.27)	
Nicaragua	N	gillnet	(1204.09)	(29.27)	
Nicaragua	N	hand	(978.61)	(132.80)	
Nicaragua	N	hook and line	(1310.53)	(39.21)	
Nicaragua	N	longline tuna	(482.40)	(54.59)	
Nicaragua	N	midwater trawl	(542.28)	(74.37)	
Nicaragua	N	pole line tuna	(978.61)	(132.80)	
Nicaragua	N	purse seine tuna	(978.61)	(132.80)	
Nicaragua	N	seine	(171.45)	(20.52)	
Nicaragua	N	shrimp trawl	(927.31)	(137.16)	
Nicaragua	N	spear	(978.61)	(132.80)	
Nicaragua	N	trap	(651.28)	(114.02)	
Nigeria	N	bottom trawl	(1082.10)	(318.75)	
Nigeria	N	dredge	(1785.19)	(302.50)	
Nigeria	N	gillnet	(1019.85)	(338.18)	
Nigeria	N	hand	(978.61)	(132.80)	
Nigeria	N	hook and line	(1539.72)	(326.37)	
Nigeria	N	longline tuna	(2006.76)	(449.60)	
Nigeria	N	midwater trawl	(289.38)	(38.85)	
Nigeria	N	pole line tuna	(978.61)	(132.80)	
Nigeria	N	purse seine tuna	(978.61)	(132.80)	
Nigeria	N	seine	(366.35)	(80.89)	
Nigeria	N	shrimp trawl	(1871.74)	(384.45)	
Nigeria	N	spear	(978.61)	(132.80)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Nigeria	N	trap	(1568.80)	(188.91)	
Norway	Y	bottom trawl	1,353.96	312.09	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Norway	N	dredge	(2222.77)	(338.42)	
Norway	Y	gillnet	1,042.61	204.86	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Norway	N	hand	(978.61)	(132.80)	
Norway	Y	hook and line	1,261.82	169.39	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Norway	Y	midwater trawl	327.14	83.65	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Norway	Y	seine	322.12	79.14	European Commission, 2006; http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Norway	N	shrimp trawl	(2550.25)	(420.94)	
Norway	N	spear	(978.61)	(132.80)	
Norway	N	trammel	(3588.50)	(154.80)	
Norway	N	trap	(1995.05)	(177.55)	
Oman	N	bottom trawl	(1071.52)	(192.76)	
Oman	N	castnets	(978.61)	(132.80)	
Oman	N	gillnet	(489.92)	(291.78)	
Oman	N	hand	(978.61)	(132.80)	
Oman	N	hook and line	(1602.26)	(240.36)	
Oman	N	longline tuna	(2467.57)	(572.51)	
Oman	N	midwater trawl	(655.23)	(106.25)	
Oman	N	pole line tuna	(978.61)	(132.80)	
Oman	N	seine	(942.33)	(259.16)	
Oman	N	shrimp trawl	(1609.08)	(284.40)	
Oman	N	trap	(1363.80)	(325.39)	
Pakistan	N	bottom trawl	(1071.52)	(192.76)	
Pakistan	N	castnets	(978.61)	(132.80)	
Pakistan	N	gillnet	(489.92)	(291.78)	
Pakistan	N	hook and line	(1602.26)	(240.36)	
Pakistan	N	longline tuna	(2467.57)	(572.51)	
Pakistan	N	midwater trawl	(655.23)	(106.25)	
Pakistan	N	net	(360.64)	(65.21)	
Pakistan	N	pole line tuna	(978.61)	(132.80)	
Pakistan	N	seine	(942.33)	(259.16)	
Pakistan	N	shrimp trawl	(1609.08)	(284.40)	
Pakistan	N	trammel	(1992.26)	(129.08)	
Pakistan	N	trap	(1363.80)	(325.39)	
Palau	N	bottom trawl	(1969.43)	(155.24)	
Palau	N	gillnet	(1342.82)	(309.85)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Palau	N	hand	(978.61)	(132.80)	
Palau	N	hook and line	(4279.31)	(696.52)	
Palau	N	liftnet	(2106.56)	(132.80)	
Palau	N	longline tuna	(4871.04)	(679.38)	
Palau	N	midwater trawl	(642.54)	(104.69)	
Palau	N	pole line tuna	(978.61)	(132.80)	
Palau	N	purse seine tuna	(978.61)	(132.80)	
Palau	N	seine	(1160.16)	(89.56)	
Palau	N	trap	(4460.19)	(513.25)	
Panama	N	bottom trawl	(461.12)	(124.63)	
Panama	N	dredge	(439.29)	(34.27)	
Panama	N	gillnet	(1204.09)	(29.27)	
Panama	N	hand	(978.61)	(132.80)	
Panama	N	hook and line	(1310.53)	(39.21)	
Panama	N	longline tuna	(482.40)	(54.59)	
Panama	N	midwater trawl	(542.28)	(74.37)	
Panama	N	pole line tuna	(978.61)	(132.80)	
Panama	N	purse seine tuna	(978.61)	(132.80)	
Panama	N	seine	(171.45)	(20.52)	
Panama	N	shrimp trawl	(927.31)	(137.16)	
Panama	N	spear	(978.61)	(132.80)	
Panama	N	trammel	(409.69)	(17.86)	
Panama	N	trap	(651.28)	(114.02)	
Papua N Guin	N	bottom trawl	(1969.43)	(155.24)	
Papua N Guin	N	dredge	(4098.19)	(369.62)	
Papua N Guin	N	gillnet	(1342.82)	(309.85)	
Papua N Guin	N	hand	(978.61)	(132.80)	
Papua N Guin	N	hook and line	(4279.31)	(696.52)	
Papua N Guin	N	longline tuna	(4871.04)	(679.38)	
Papua N Guin	N	midwater trawl	(642.54)	(104.69)	
Papua N Guin	N	pole line tuna	(978.61)	(132.80)	
Papua N Guin	N	purse seine tuna	(978.61)	(132.80)	
Papua N Guin	N	shrimp trawl	(4364.20)	(674.00)	
Papua N Guin	N	spear	(978.61)	(132.80)	
Papua N Guin	N	trap	(4460.19)	(513.25)	
Peru	N	bottom trawl	(635.13)	(160.81)	
Peru	N	dredge	(439.29)	(34.27)	
Peru	N	gillnet	(1204.09)	(29.27)	
Peru	N	hand	(978.61)	(132.80)	
Peru	N	hook and line	(1310.53)	(39.21)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Peru	N	longline tuna	(482.40)	(54.59)	
Peru	Y	midwater trawl	205.37	47.60	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Peru	N	pole line tuna	(978.61)	(132.80)	
Peru	N	purse seine tuna	(978.61)	(132.80)	
Peru	Y	seine	171.27	20.52	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Peru	N	shrimp trawl	(927.31)	(137.16)	
Peru	N	spear	(978.61)	(132.80)	
Peru	N	trammel	(409.69)	(17.86)	
Peru	N	trap	(651.28)	(114.02)	
Philippines	N	bottom trawl	(1071.52)	(192.76)	
Philippines	N	castnets	(978.61)	(132.80)	
Philippines	N	dredge	(2092.03)	(317.27)	
Philippines	N	gillnet	(489.92)	(291.78)	
Philippines	N	hand	(978.61)	(132.80)	
Philippines	N	hook and line	(1602.26)	(240.36)	
Philippines	N	liftnet	(1086.93)	(132.80)	
Philippines	N	longline tuna	(2467.57)	(572.51)	
Philippines	N	midwater trawl	(655.23)	(106.25)	
Philippines	N	net	(360.64)	(65.21)	
Philippines	N	pole line tuna	(978.61)	(132.80)	
Philippines	N	purse seine tuna	(978.61)	(132.80)	
Philippines	N	seine	(942.33)	(259.16)	
Philippines	N	shrimp trawl	(1609.08)	(284.40)	
Philippines	N	spear	(978.61)	(132.80)	
Philippines	N	trammel	(1992.26)	(129.08)	
Philippines	N	trap	(1363.80)	(325.39)	
Poland	Y	bottom trawl	661.94	401.08	European Commission, 2006
Poland	Y	gillnet	1,130.43	673.35	European Commission, 2006
Poland	N	hand	(978.61)	(132.80)	
Poland	Y	hook and line	1,088.85	544.42	European Commission, 2006
Poland	Y	midwater trawl	217.86	74.61	European Commission, 2006
Poland	N	seine	(821.73)	(136.17)	
Poland	N	shrimp trawl	(2550.25)	(420.94)	
Poland	N	trap	(1995.05)	(177.55)	
Portugal	Y	bottom trawl	2,093.56	295.88	European Commission, 2006
Portugal	N	dredge	(2222.77)	(338.42)	
Portugal	Y	gillnet	3,801.74	606.06	European Commission, 2006
Portugal	N	hand	(978.61)	(132.80)	
Portugal	Y	hook and line	2,639.75	390.68	European Commission, 2006
Portugal	N	liftnet	(978.61)	(132.80)	
Portugal	N	longline tuna	(3813.03)	(663.89)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Portugal	N	midwater trawl	(493.14)	(126.82)	
Portugal	N	net	(581.84)	(72.58)	
Portugal	N	pole line tuna	(978.61)	(132.80)	
Portugal	N	purse seine tuna	(978.61)	(132.80)	
Portugal	Y	seine	794.35	62.02	European Commission, 2006
Portugal	N	shrimp trawl	(2550.25)	(420.94)	
Portugal	N	spear	(978.61)	(132.80)	
Portugal	N	trammel	(3588.50)	(154.80)	
Portugal	N	trap	(1995.05)	(177.55)	
Qatar	N	bottom trawl	(1071.52)	(192.76)	
Qatar	N	gillnet	(489.92)	(291.78)	
Qatar	N	hook and line	(1602.26)	(240.36)	
Qatar	N	midwater trawl	(655.23)	(106.25)	
Qatar	N	seine	(942.33)	(259.16)	
Qatar	N	spear	(978.61)	(132.80)	
Qatar	N	trap	(1363.80)	(325.39)	
Romania	N	bottom trawl	(2263.59)	(386.65)	
Romania	N	gillnet	(2412.41)	(461.02)	
Romania	N	hook and line	(2231.00)	(363.72)	
Romania	N	midwater trawl	(493.14)	(126.82)	
Romania	N	seine	(821.73)	(136.17)	
Russian Fed	N	bottom trawl	(2263.59)	(386.65)	
Russian Fed	N	dredge	(2222.77)	(338.42)	
Russian Fed	N	gillnet	(2412.41)	(461.02)	
Russian Fed	N	hand	(978.61)	(132.80)	
Russian Fed	N	hook and line	(2231.00)	(363.72)	
Russian Fed	N	longline tuna	(3813.03)	(663.89)	
Russian Fed	N	midwater trawl	(493.14)	(126.82)	
Russian Fed	N	net	(581.84)	(72.58)	
Russian Fed	N	pole line tuna	(978.61)	(132.80)	
Russian Fed	N	purse seine tuna	(978.61)	(132.80)	
Russian Fed	N	seine	(821.73)	(136.17)	
Russian Fed	N	shrimp trawl	(2550.25)	(420.94)	
Russian Fed	N	spear	(978.61)	(132.80)	
Russian Fed	N	trammel	(3588.50)	(154.80)	
Russian Fed	N	trap	(1995.05)	(177.55)	
Samoa	N	bottom trawl	(1969.43)	(155.24)	
Samoa	N	dredge	(4098.19)	(369.62)	
Samoa	N	gillnet	(1342.82)	(309.85)	
Samoa	N	hand	(978.61)	(132.80)	
Samoa	N	hook and line	(4279.31)	(696.52)	
Samoa	N	longline tuna	(4871.04)	(679.38)	
Samoa	N	midwater trawl	(642.54)	(104.69)	
Samoa	N	pole line tuna	(978.61)	(132.80)	
Samoa	N	purse seine tuna	(978.61)	(132.80)	
Samoa	N	seine	(1160.16)	(89.56)	
Samoa	N	spear	(978.61)	(132.80)	
Samoa	N	trap	(4460.19)	(513.25)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Sao Tome Prn	N	bottom trawl	(1082.10)	(318.75)	
Sao Tome Prn	N	dredge	(1785.19)	(302.50)	
Sao Tome Prn	N	gillnet	(1019.85)	(338.18)	
Sao Tome Prn	N	hand	(978.61)	(132.80)	
Sao Tome Prn	N	hook and line	(1539.72)	(326.37)	
Sao Tome Prn	N	liftnet	(916.35)	(132.80)	
Sao Tome Prn	N	longline tuna	(2006.76)	(449.60)	
Sao Tome Prn	N	midwater trawl	(289.38)	(38.85)	
Sao Tome Prn	N	pole line tuna	(978.61)	(132.80)	
Sao Tome Prn	N	purse seine tuna	(978.61)	(132.80)	
Sao Tome Prn	N	seine	(366.35)	(80.89)	
Sao Tome Prn	N	spear	(978.61)	(132.80)	
Sao Tome Prn	N	trammel	(1625.09)	(117.69)	
Sao Tome Prn	N	trap	(1568.80)	(188.91)	
Saudi Arabia	N	bottom trawl	(1071.52)	(192.76)	
Saudi Arabia	N	castnets	(978.61)	(132.80)	
Saudi Arabia	N	gillnet	(489.92)	(291.78)	
Saudi Arabia	N	hand	(978.61)	(132.80)	
Saudi Arabia	N	hook and line	(1602.26)	(240.36)	
Saudi Arabia	N	liftnet	(1086.93)	(132.80)	
Saudi Arabia	N	midwater trawl	(655.23)	(106.25)	
Saudi Arabia	N	net	(360.64)	(65.21)	
Saudi Arabia	N	pole line tuna	(978.61)	(132.80)	
Saudi Arabia	N	seine	(942.33)	(259.16)	
Saudi Arabia	N	shrimp trawl	(1609.08)	(284.40)	
Saudi Arabia	N	spear	(978.61)	(132.80)	
Saudi Arabia	N	trap	(1363.80)	(325.39)	
Senegal	Y	bottom trawl	1,082.10	318.75	http://www.fao.org/docrep/008/y6982e/y6982e00.htm; Gert van Santen pers comm., 2009
Senegal	N	dredge	(1785.19)	(302.50)	
Senegal	Y	gillnet	954.87	334.35	http://www.fao.org/docrep/008/y6982e/y6982e00.htm; Gert van Santen pers comm., 2009
Senegal	N	hand	(978.61)	(132.80)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Senegal	Y	hook and line	1,894.04	380.78	http://www.fao.org/docrep/008/y6982e/y6982e00.htm; Gert van Santen pers comm., 2009
Senegal	N	longline tuna	(2006.76)	(449.60)	
Senegal	N	midwater trawl	(289.38)	(38.85)	
Senegal	N	pole line tuna	(978.61)	(132.80)	
Senegal	N	purse seine tuna	(978.61)	(132.80)	
Senegal	Y	seine	173.85	22.50	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Senegal	N	shrimp trawl	(1871.74)	(384.45)	
Senegal	N	spear	(978.61)	(132.80)	
Senegal	N	trammel	(1625.09)	(117.69)	
Senegal	N	trap	(1568.80)	(188.91)	
Seychelles	N	bottom trawl	(1082.10)	(318.75)	
Seychelles	N	castnets	(978.61)	(132.80)	
Seychelles	N	dredge	(1785.19)	(302.50)	
Seychelles	N	gillnet	(1019.85)	(338.18)	
Seychelles	N	hand	(978.61)	(132.80)	
Seychelles	N	hook and line	(1539.72)	(326.37)	
Seychelles	N	longline tuna	(2006.76)	(449.60)	
Seychelles	N	midwater trawl	(289.38)	(38.85)	
Seychelles	N	pole line tuna	(978.61)	(132.80)	
Seychelles	N	seine	(366.35)	(80.89)	
Seychelles	N	spear	(978.61)	(132.80)	
Seychelles	N	trap	(1568.80)	(188.91)	
Sierra Leone	N	bottom trawl	(1082.10)	(318.75)	
Sierra Leone	N	dredge	(1785.19)	(302.50)	
Sierra Leone	N	gillnet	(1019.85)	(338.18)	
Sierra Leone	N	hand	(978.61)	(132.80)	
Sierra Leone	N	hook and line	(1539.72)	(326.37)	
Sierra Leone	N	midwater trawl	(289.38)	(38.85)	
Sierra Leone	N	seine	(366.35)	(80.89)	
Sierra Leone	N	shrimp trawl	(1871.74)	(384.45)	
Sierra Leone	N	spear	(978.61)	(132.80)	
Sierra Leone	N	trap	(1568.80)	(188.91)	
Singapore	N	bottom trawl	(1071.52)	(192.76)	
Singapore	N	gillnet	(489.92)	(291.78)	
Singapore	N	hook and line	(1602.26)	(240.36)	
Singapore	N	longline tuna	(2467.57)	(572.51)	
Singapore	N	midwater trawl	(655.23)	(106.25)	
Singapore	N	pole line tuna	(978.61)	(132.80)	
Singapore	N	purse seine tuna	(978.61)	(132.80)	
Singapore	N	seine	(942.33)	(259.16)	
Singapore	N	shrimp trawl	(1609.08)	(284.40)	
Singapore	N	trammel	(1992.26)	(129.08)	
Singapore	N	trap	(1363.80)	(325.39)	
Solomon Is.	N	bottom trawl	(1969.43)	(155.24)	
Solomon Is.	N	dredge	(4098.19)	(369.62)	
Solomon Is.	N	gillnet	(1342.82)	(309.85)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Solomon Is.	N	hand	(978.61)	(132.80)	
Solomon Is.	N	hook and line	(4279.31)	(696.52)	
Solomon Is.	N	longline tuna	(4871.04)	(679.38)	
Solomon Is.	N	pole line tuna	(978.61)	(132.80)	
Solomon Is.	N	purse seine tuna	(978.61)	(132.80)	
Solomon Is.	N	shrimp trawl	(4364.20)	(674.00)	
Solomon Is.	N	spear	(978.61)	(132.80)	
Somalia	N	bottom trawl	(1082.10)	(318.75)	
Somalia	N	trap	(1568.80)	(188.91)	
South Africa	N	bottom trawl	(1082.10)	(318.75)	
South Africa	N	dredge	(1785.19)	(302.50)	
South Africa	N	gillnet	(1019.85)	(338.18)	
South Africa	N	hand	(978.61)	(132.80)	
South Africa	Y	hook and line	1,111.86	238.45	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
South Africa	N	longline tuna	(2006.76)	(449.60)	
South Africa	N	midwater trawl	(289.38)	(38.85)	
South Africa	N	pole line tuna	(978.61)	(132.80)	
South Africa	N	purse seine tuna	(978.61)	(132.80)	
South Africa	N	seine	(366.35)	(80.89)	
South Africa	N	shrimp trawl	(1871.74)	(384.45)	
South Africa	N	trammel	(1625.09)	(117.69)	
South Africa	N	trap	(1568.80)	(188.91)	
Spain	Y	bottom trawl	2,808.00	512.20	European Commission, 2006; Garza-Gil and Varela Lafuente, 2007
Spain	N	dredge	(2222.77)	(338.42)	
Spain	N	gillnet	(2412.41)	(461.02)	
Spain	N	hand	(978.61)	(132.80)	
Spain	Y	hook and line	3,000.60	474.76	European Commission, 2006
Spain	N	liftnet	(978.61)	(132.80)	
Spain	N	longline tuna	(3813.03)	(663.89)	
Spain	N	midwater trawl	(912.66)	(142.77)	
Spain	N	net	(581.84)	(72.58)	
Spain	N	pole line tuna	(978.61)	(132.80)	
Spain	N	purse seine tuna	(978.61)	(132.80)	
Spain	Y	seine	756.55	202.45	European Commission, 2006
Spain	N	shrimp trawl	(2550.25)	(420.94)	
Spain	N	spear	(978.61)	(132.80)	
Spain	N	trammel	(3588.50)	(154.80)	
Spain	N	trap	(1995.05)	(177.55)	
Sri Lanka	N	bottom trawl	(1071.52)	(192.76)	
Sri Lanka	N	dredge	(2092.03)	(317.27)	
Sri Lanka	Y	gillnet	365.50	135.72	ftp://ftp.fao.org/docrep/fao/007/ad888e/ad888e00.pdf; Maldeniya and Suraweera (1991)
Sri Lanka	N	hand	(978.61)	(132.80)	
Sri Lanka	N	hook and line	(1602.26)	(240.36)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Sri Lanka	N	longline tuna	(2467.57)	(572.51)	
Sri Lanka	N	midwater trawl	(655.23)	(106.25)	
Sri Lanka	N	pole line tuna	(978.61)	(132.80)	
Sri Lanka	N	seine	(942.33)	(259.16)	
Sri Lanka	N	spear	(978.61)	(132.80)	
Sri Lanka	N	trap	(1363.80)	(325.39)	
St Kitts Nev	N	bottom trawl	(461.12)	(124.63)	
St Kitts Nev	N	dredge	(439.29)	(34.27)	
St Kitts Nev	N	gillnet	(1204.09)	(29.27)	
St Kitts Nev	N	hand	(978.61)	(132.80)	
St Kitts Nev	N	hook and line	(1310.53)	(39.21)	
St Kitts Nev	N	midwater trawl	(542.28)	(74.37)	
St Kitts Nev	N	seine	(171.45)	(20.52)	
St Kitts Nev	N	spear	(978.61)	(132.80)	
St Kitts Nev	N	trap	(651.28)	(114.02)	
St Lucia	N	bottom trawl	(461.12)	(124.63)	
St Lucia	N	dredge	(439.29)	(34.27)	
St Lucia	N	gillnet	(1204.09)	(29.27)	
St Lucia	N	hand	(978.61)	(132.80)	
St Lucia	N	hook and line	(1310.53)	(39.21)	
St Lucia	N	longline tuna	(482.40)	(54.59)	
St Lucia	N	midwater trawl	(542.28)	(74.37)	
St Lucia	N	pole line tuna	(978.61)	(132.80)	
St Lucia	N	purse seine tuna	(978.61)	(132.80)	
St Lucia	N	seine	(171.45)	(20.52)	
St Lucia	N	spear	(978.61)	(132.80)	
St Lucia	N	trap	(651.28)	(114.02)	
St Vincent	N	bottom trawl	(461.12)	(124.63)	
St Vincent	N	dredge	(439.29)	(34.27)	
St Vincent	N	gillnet	(1204.09)	(29.27)	
St Vincent	N	hand	(978.61)	(132.80)	
St Vincent	N	hook and line	(1310.53)	(39.21)	
St Vincent	N	longline tuna	(482.40)	(54.59)	
St Vincent	N	pole line tuna	(978.61)	(132.80)	
St Vincent	N	purse seine tuna	(978.61)	(132.80)	
St Vincent	N	seine	(171.45)	(20.52)	
St Vincent	N	spear	(978.61)	(132.80)	
St Vincent	N	trap	(651.28)	(114.02)	
Sudan	N	bottom trawl	(1082.10)	(318.75)	
Sudan	N	gillnet	(1019.85)	(338.18)	
Sudan	N	hook and line	(1539.72)	(326.37)	
Suriname	N	bottom trawl	(1071.52)	(192.76)	
Suriname	N	shrimp trawl	(1609.08)	(284.40)	
Suriname	N	trap	(1363.80)	(325.39)	
Sweden	Y	bottom trawl	2,877.55	289.22	European Commission, 2006
Sweden	N	dredge	(2222.77)	(338.42)	
Sweden	Y	gillnet	1,569.66	461.02	European Commission, 2006
Sweden	N	hand	(978.61)	(132.80)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Sweden	N	hook and line	(2231.00)	(363.72)	
Sweden	Y	midwater trawl	307.75	121.98	European Commission, 2006
Sweden	N	seine	(821.73)	(136.17)	
Sweden	N	shrimp trawl	(2550.25)	(420.94)	
Sweden	N	spear	(978.61)	(132.80)	
Sweden	N	trammel	(3588.50)	(154.80)	
Sweden	N	trap	(1995.05)	(177.55)	
Syria	N	bottom trawl	(1071.52)	(192.76)	
Syria	N	dredge	(2092.03)	(317.27)	
Syria	N	gillnet	(489.92)	(291.78)	
Syria	N	hand	(978.61)	(132.80)	
Syria	N	hook and line	(1602.26)	(240.36)	
Syria	N	liftnet	(978.61)	(132.80)	
Syria	N	longline tuna	(2467.57)	(572.51)	
Syria	N	midwater trawl	(655.23)	(106.25)	
Syria	N	pole line tuna	(978.61)	(132.80)	
Syria	N	purse seine tuna	(978.61)	(132.80)	
Syria	N	seine	(942.33)	(259.16)	
Syria	N	spear	(978.61)	(132.80)	
Syria	N	trap	(1363.80)	(325.39)	
Taiwan	Y	bottom trawl	1,069.96	192.76	http://www.fa.gov.tw/chnn/statistics_publish/statistics/economy/92economy.pdf
Taiwan	N	dredge	(2092.03)	(317.27)	
Taiwan	Y	gillnet	2,015.89	291.78	http://www.fa.gov.tw/chnn/statistics_publish/statistics/economy/92economy.pdf
Taiwan	N	hand	(978.61)	(132.80)	
Taiwan	Y	hook and line	3,454.24	240.36	http://www.fa.gov.tw/chnn/statistics_publish/statistics/economy/92economy.pdf
Taiwan	Y	liftnet	1,086.93	132.80	http://www.fa.gov.tw/chnn/statistics_publish/statistics/economy/92economy.pdf
Taiwan	Y	longline tuna	2,342.91	572.51	http://www.fao.org/DOCREP/003/W9926E/W9926E00.HTM
Taiwan	N	midwater trawl	(655.23)	(106.25)	
Taiwan	N	net	(360.64)	(65.21)	
Taiwan	N	pole line tuna	(978.61)	(132.80)	
Taiwan	N	purse seine tuna	(978.61)	(132.80)	
Taiwan	N	seine	(1590.77)	(421.06)	
Taiwan	N	shrimp trawl	(1609.08)	(284.40)	
Taiwan	N	spear	(978.61)	(132.80)	
Taiwan	N	trammel	(1992.26)	(129.08)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne) [c]	Source(s)
Taiwan	Y	trap	1,817.86	325.39	http://www.fa.gov.tw/chnn/statistics_publish/statistics/economy/92economy.pdf
Tanzania	N	bottom trawl	(1082.10)	(318.75)	
Tanzania	N	castnets	(978.61)	(132.80)	
Tanzania	N	dredge	(1785.19)	(302.50)	
Tanzania	N	gillnet	(1019.85)	(338.18)	
Tanzania	N	hand	(978.61)	(132.80)	
Tanzania	N	hook and line	(1539.72)	(326.37)	
Tanzania	N	longline tuna	(2006.76)	(449.60)	
Tanzania	N	midwater trawl	(289.38)	(38.85)	
Tanzania	N	pole line tuna	(978.61)	(132.80)	
Tanzania	N	seine	(366.35)	(80.89)	
Tanzania	N	shrimp trawl	(1871.74)	(384.45)	
Tanzania	N	spear	(978.61)	(132.80)	
Tanzania	N	trammel	(1625.09)	(117.69)	
Tanzania	N	trap	(1568.80)	(188.91)	
Thailand	Y	bottom trawl	363.76	91.27	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Thailand	N	castnets	(978.61)	(132.80)	
Thailand	N	dredge	(2092.03)	(317.27)	
Thailand	N	gillnet	(489.92)	(291.78)	
Thailand	N	hand	(978.61)	(132.80)	
Thailand	N	hook and line	(1602.26)	(240.36)	
Thailand	N	liftnet	(1086.93)	(132.80)	
Thailand	N	longline tuna	(2467.57)	(572.51)	
Thailand	Y	midwater trawl	321.43	71.70	
Thailand	Y	net	876.91	75.57	http://www.fao.org/docrep/008/y6982e/y6982e00.htm
Thailand	N	pole line tuna	(978.61)	(132.80)	
Thailand	N	seine	(942.33)	(259.16)	
Thailand	N	shrimp trawl	(1609.08)	(284.40)	
Thailand	N	spear	(978.61)	(132.80)	
Thailand	N	trammel	(1992.26)	(129.08)	
Thailand	N	trap	(1363.80)	(325.39)	
Togo	N	bottom trawl	(1082.10)	(318.75)	
Togo	N	gillnet	(1019.85)	(338.18)	
Togo	N	hand	(978.61)	(132.80)	
Togo	N	hook and line	(1539.72)	(326.37)	
Togo	N	longline tuna	(2006.76)	(449.60)	
Togo	N	midwater trawl	(289.38)	(38.85)	
Togo	N	pole line tuna	(978.61)	(132.80)	
Togo	N	purse seine tuna	(978.61)	(132.80)	
Togo	N	seine	(366.35)	(80.89)	
Togo	N	shrimp trawl	(1871.74)	(384.45)	
Togo	N	trap	(1568.80)	(188.91)	
Tonga	N	bottom trawl	(1969.43)	(155.24)	
Tonga	N	dredge	(4098.19)	(369.62)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Tonga	N	gillnet	(1342.82)	(309.85)	
Tonga	N	hand	(978.61)	(132.80)	
Tonga	N	hook and line	(4279.31)	(696.52)	
Tonga	N	longline tuna	(4871.04)	(679.38)	
Tonga	N	midwater trawl	(642.54)	(104.69)	
Tonga	N	pole line tuna	(978.61)	(132.80)	
Tonga	N	purse seine tuna	(978.61)	(132.80)	
Tonga	N	seine	(1160.16)	(89.56)	
Tonga	N	spear	(978.61)	(132.80)	
Tonga	N	trap	(4460.19)	(513.25)	
Trinidad Tob	Y	bottom trawl	1,367.67	291.69	Kuruvilla *et al*., 2002
Trinidad Tob	N	gillnet	(1204.09)	(29.27)	
Trinidad Tob	Y	hook and line	728.55	39.21	http://www.fao.org/docrep/008/y6982e/y6982e000.htm
Trinidad Tob	N	longline tuna	(482.40)	(54.59)	
Trinidad Tob	N	midwater trawl	(542.28)	(74.37)	
Trinidad Tob	N	pole line tuna	(978.61)	(132.80)	
Trinidad Tob	N	purse seine tuna	(978.61)	(132.80)	
Trinidad Tob	N	seine	(171.45)	(20.52)	
Trinidad Tob	N	shrimp trawl	(927.31)	(137.16)	
Trinidad Tob	N	spear	(978.61)	(132.80)	
Trinidad Tob	N	trap	(651.28)	(114.02)	
Tunisia	N	bottom trawl	(1082.10)	(318.75)	
Tunisia	N	dredge	(1785.19)	(302.50)	
Tunisia	N	gillnet	(1019.85)	(338.18)	
Tunisia	N	hand	(978.61)	(132.80)	
Tunisia	N	hook and line	(1539.72)	(326.37)	
Tunisia	N	liftnet	(978.61)	(132.80)	
Tunisia	N	longline tuna	(2006.76)	(449.60)	
Tunisia	N	midwater trawl	(289.38)	(38.85)	
Tunisia	N	pole line tuna	(978.61)	(132.80)	
Tunisia	N	purse seine tuna	(978.61)	(132.80)	
Tunisia	N	seine	(366.35)	(80.89)	
Tunisia	N	shrimp trawl	(1871.74)	(384.45)	
Tunisia	N	spear	(978.61)	(132.80)	
Tunisia	N	trammel	(1625.09)	(117.69)	
Tunisia	N	trap	(1568.80)	(188.91)	
Turkey	N	bottom trawl	(1071.52)	(192.76)	
Turkey	N	dredge	(2092.03)	(317.27)	
Turkey	N	gillnet	(489.92)	(291.78)	
Turkey	N	hand	(978.61)	(132.80)	
Turkey	N	hook and line	(1602.26)	(240.36)	
Turkey	N	longline tuna	(2467.57)	(572.51)	
Turkey	N	midwater trawl	(655.23)	(106.25)	
Turkey	N	pole line tuna	(978.61)	(132.80)	
Turkey	N	purse seine tuna	(978.61)	(132.80)	
Turkey	N	seine	(942.33)	(259.16)	
Turkey	N	shrimp trawl	(1609.08)	(284.40)	
Turkey	N	spear	(978.61)	(132.80)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Turkey	N	trap	(1363.80)	(325.39)	
UK	Y	bottom trawl	3,045.81	402.55	European Commission, 2006
UK	N	dredge	(2222.77)	(338.42)	
UK	N	gillnet	(2412.41)	(461.02)	
UK	N	hand	(978.61)	(132.80)	
UK	N	hook and line	(2231.00)	(363.72)	
UK	N	longline tuna	(3813.03)	(663.89)	
UK	N	midwater trawl	(493.14)	(126.82)	
UK	N	pole line tuna	(978.61)	(132.80)	
UK	N	purse seine tuna	(978.61)	(132.80)	
UK	Y	seine	2,175.03	256.23	European Commission, 2006
UK	N	shrimp trawl	(2550.25)	(420.94)	
UK	N	spear	(978.61)	(132.80)	
UK	N	trammel	(3588.50)	(154.80)	
UK	N	trap	(1995.05)	(177.55)	
Ukraine	N	bottom trawl	(2263.59)	(386.65)	
Ukraine	N	dredge	(2222.77)	(338.42)	
Ukraine	N	gillnet	(2412.41)	(461.02)	
Ukraine	N	hand	(978.61)	(132.80)	
Ukraine	N	hook and line	(2231.00)	(363.72)	
Ukraine	N	midwater trawl	(493.14)	(126.82)	
Ukraine	N	seine	(821.73)	(136.17)	
Ukraine	N	shrimp trawl	(2550.25)	(420.94)	
Ukraine	N	spear	(978.61)	(132.80)	
Ukraine	N	trap	(1995.05)	(177.55)	
Untd Arab Em	N	castnets	(978.61)	(132.80)	
Untd Arab Em	N	gillnet	(489.92)	(291.78)	
Untd Arab Em	N	hook and line	(1602.26)	(240.36)	
Untd Arab Em	N	pole line tuna	(978.61)	(132.80)	
Untd Arab Em	N	seine	(942.33)	(259.16)	
Untd Arab Em	N	trap	(1363.80)	(325.39)	
Uruguay	N	bottom trawl	(461.12)	(124.63)	
Uruguay	N	dredge	(439.29)	(34.27)	
Uruguay	N	gillnet	(1204.09)	(29.27)	
Uruguay	N	hand	(978.61)	(132.80)	
Uruguay	N	hook and line	(1310.53)	(39.21)	
Uruguay	N	longline tuna	(482.40)	(54.59)	
Uruguay	N	midwater trawl	(542.28)	(74.37)	
Uruguay	N	pole line tuna	(978.61)	(132.80)	
Uruguay	N	purse seine tuna	(978.61)	(132.80)	
Uruguay	N	seine	(171.45)	(20.52)	
Uruguay	N	shrimp trawl	(927.31)	(137.16)	
Uruguay	N	spear	(978.61)	(132.80)	
Uruguay	N	trap	(651.28)	(114.02)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
USA	Y	bottom trawl	1,372.24	149.96	
USA	N	castnets	(978.61)	(132.80)	
USA	Y	dredge	2,642.48	223.11	Gautam and Kitts, 1996
USA	Y	gillnet	890.13	251.79	NOAA (https://fish.nefsc.noaa.gov/fvcs/a)
USA	N	hand	(978.61)	(132.80)	
USA	Y	hook and line	2,773.30	235.59	Larkin *et al.,* 2000; O'Malley and Pooley, 2000; Porter *et al*., 2001
USA	N	longline tuna	(2586.86)	(423.04)	
USA	Y	midwater trawl	322.92	100.14	
USA	N	net	(391.54)	(61.73)	
USA	N	pole line tuna	(978.61)	(132.80)	
USA	N	purse seine tuna	(978.61)	(132.80)	
USA	Y	seine	498.06	70.61	NOAA (https://fish.nefsc.noaa.gov/fvcs/a)
USA	N	shrimp trawl	(1707.78)	(243.80)	
USA	N	spear	(978.61)	(132.80)	
USA	N	trammel	(2296.05)	(205.78)	
USA	N	trap	(3306.58)	(235.59)	
Vanuatu	N	bottom trawl	(1969.43)	(155.24)	
Vanuatu	N	dredge	(4098.19)	(369.62)	
Vanuatu	N	gillnet	(1342.82)	(309.85)	
Vanuatu	N	hand	(978.61)	(132.80)	
Vanuatu	N	hook and line	(4279.31)	(696.52)	
Vanuatu	N	longline tuna	(4871.04)	(679.38)	
Vanuatu	N	midwater trawl	(642.54)	(104.69)	
Vanuatu	N	pole line tuna	(978.61)	(132.80)	
Vanuatu	N	purse seine tuna	(978.61)	(132.80)	
Vanuatu	N	seine	(1160.16)	(89.56)	
Vanuatu	N	spear	(978.61)	(132.80)	
Vanuatu	N	trap	(4460.19)	(513.25)	
Venezuela	N	bottom trawl	(461.12)	(124.63)	
Venezuela	N	dredge	(439.29)	(34.27)	
Venezuela	N	gillnet	(1204.09)	(29.27)	
Venezuela	N	hand	(978.61)	(132.80)	
Venezuela	N	hook and line	(1310.53)	(39.21)	
Venezuela	N	longline tuna	(482.40)	(54.59)	
Venezuela	N	midwater trawl	(542.28)	(74.37)	
Venezuela	N	pole line tuna	(978.61)	(132.80)	
Venezuela	N	purse seine tuna	(978.61)	(132.80)	
Venezuela	N	seine	(171.45)	(20.52)	
Venezuela	N	shrimp trawl	(927.31)	(137.16)	
Venezuela	N	spear	(978.61)	(132.80)	
Venezuela	N	trammel	(409.69)	(17.86)	
Venezuela	N	trap	(651.28)	(114.02)	
Viet Nam	N	bottom trawl	(1071.52)	(192.76)	
Viet Nam	N	dredge	(2092.03)	(317.27)	
Viet Nam	N	gillnet	(489.92)	(291.78)	

Country	Raw Data (Y/N)[a]	Gear types[b]	Average Variable Cost (US$/tonne)[c]	Average Fixed Cost (US$/tonne)[c]	Source(s)
Viet Nam	N	hand	(978.61)	(132.80)	
Viet Nam	Y	hook and line	1,662.29	110.85	Long *et al.,* 2008
Viet Nam	N	midwater trawl	(655.23)	(106.25)	
Viet Nam	N	net	(360.64)	(65.21)	
Viet Nam	N	seine	(942.33)	(259.16)	
Viet Nam	N	shrimp trawl	(1609.08)	(284.40)	
Viet Nam	N	spear	(978.61)	(132.80)	
Viet Nam	N	trap	(1363.80)	(325.39)	
Yemen	N	bottom trawl	(1071.52)	(192.76)	
Yemen	N	castnets	(978.61)	(132.80)	
Yemen	N	dredge	(2092.03)	(317.27)	
Yemen	N	gillnet	(489.92)	(291.78)	
Yemen	N	hand	(978.61)	(132.80)	
Yemen	N	hook and line	(1602.26)	(240.36)	
Yemen	N	longline tuna	(2467.57)	(572.51)	
Yemen	N	midwater trawl	(655.23)	(106.25)	
Yemen	N	pole line tuna	(978.61)	(132.80)	
Yemen	N	seine	(942.33)	(259.16)	
Yemen	N	shrimp trawl	(1609.08)	(284.40)	
Yemen	N	spear	(978.61)	(132.80)	
Yemen	N	trap	(1363.80)	(325.39)	

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659 [a] Raw data Y/N indicates the data is obtained from data sources (Y) or estimated from progressive
660 refinement process (N).
661
662 [b] Gear type follows fishing gear categorization system used in *Sea Around Us Project* database.
663
664 [c] Figures in parenthesis are estimated from progressive refinement process.
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