

Marine Fishery Resources of the World

Overview of Marine Fishery resources: According to FAO, both Atlantic and Pacific oceans are considered fully fished and sees some prospects for increasing Indian Ocean fisheries as India has one of the longest coastlines in the world. They examined long term trend of 200 major fish resources representing 77% of the marine fish landings of the world and concluded that

- About 47 to 50% of the stocks are fully exploited.
- An estimate of 25 to 27% are under exploited or moderately exploited.
- Another 15 to 18% are over exploited and have no potential for further increase.
- The remaining 9 to 10% stocks have been depleted.

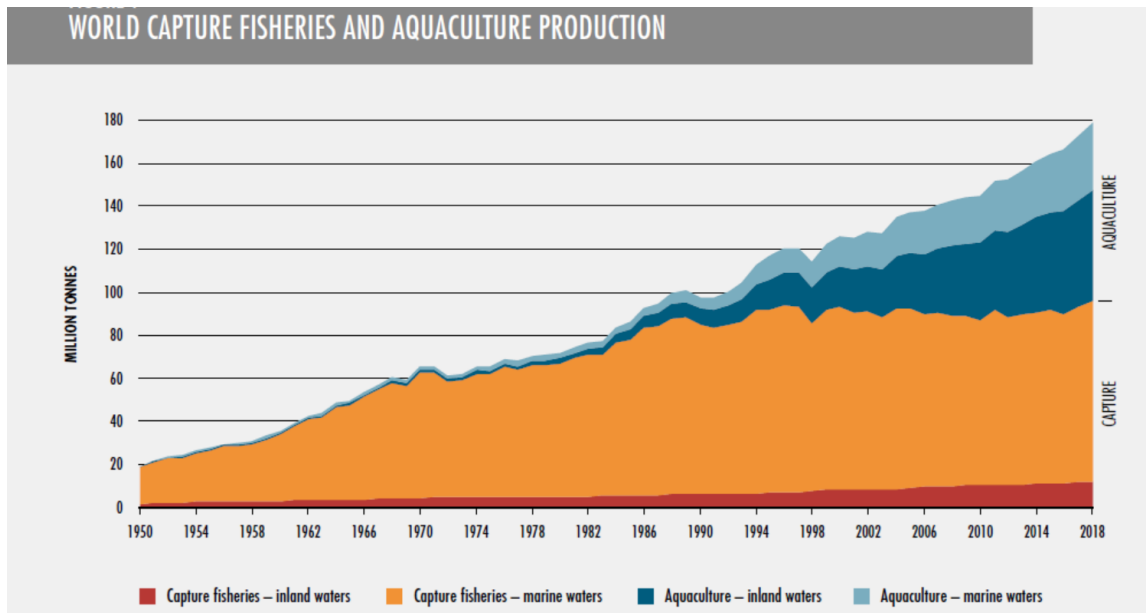
Major fluctuations have been recorded for some individual species. High landings are dependent on one or two productive stocks such as Alaska Pollock and Japanese Anchovy in the North West Pacific, Atlantic herring in the North East Atlantic and skipjack and yellow fin tuna in the Western Central Pacific. The over all trend depends on major tuna stocks and older categories of marine fish. If the factors influencing capture fisheries such as over fishing, by catch discard and other management measures are not resolved, pressure on capture fisheries will continue and decline in production is certain. In general, the major fisheries of the world occur in two main areas, the areas of **wide continental shelf** and **upwelling areas**. The areas of upwelling include Peru, South Africa, North West Africa, California and south west coast of India.

Total World Fish Production: The total world fish production from both capture and culture fisheries was 101.8 million tonnes during 1986-1995 which was increased to 178.5 mt in 2018. Of this, 156.4 mt of fish was used for food, providing a per capita apparent consumption of 20.5 kg, remaining 22.2 mt was destined for non-food uses, in particular the manufacture of fish meal and oil and direct feed for aquaculture (data for 2018).

Table 1: World fisheries and aquaculture production and utilization (Source: THE STATE OF WORLD FISHERIES AND AQUACULTURE 2020)

	1986–1995	1996–2005	2006–2015	2016	2017	2018
	Average per year					
	(million tonnes, live weight)					
Production						
Capture						
Inland	6.4	8.3	10.6	11.4	11.9	12.0
Marine	80.5	83.0	79.3	78.3	81.2	84.4
Total capture	86.9	91.4	89.8	89.6	93.1	96.4
Aquaculture						
Inland	8.6	19.8	36.8	48.0	49.6	51.3
Marine	6.3	14.4	22.8	28.5	30.0	30.8
Total aquaculture	14.9	34.2	59.7	76.5	79.5	82.1
Total world fisheries and aquaculture	101.8	125.6	149.5	166.1	172.7	178.5
Utilization²						
Human consumption	71.8	98.5	129.2	148.2	152.9	156.4
Non-food uses	29.9	27.1	20.3	17.9	19.7	22.2
Population (billions) ³	5.4	6.2	7.0	7.5	7.5	7.6
Per capita apparent consumption (kg)	13.4	15.9	18.4	19.9	20.3	20.5

World marine capture fisheries production: World marine capture fisheries production which was 80.5 mt during 1986-1995, there was a decreased during 2006-2016 and then increased to 84.4 mt in 2018. Slight increase in marine capture is due to improved gear selectivity and fishing practices, fisheries management that decreases access to some stocks, no discard policies in some countries and growing demand for fish combined with improved technologies and opportunities for utilizing by catch recently, significant changes have taken place in the offshore fisheries of the world.. The following graph shows the contribution made by the marine capture fisheries sector to the total world capture fisheries and aquaculture production (in million tonnes) during 1950-2018.

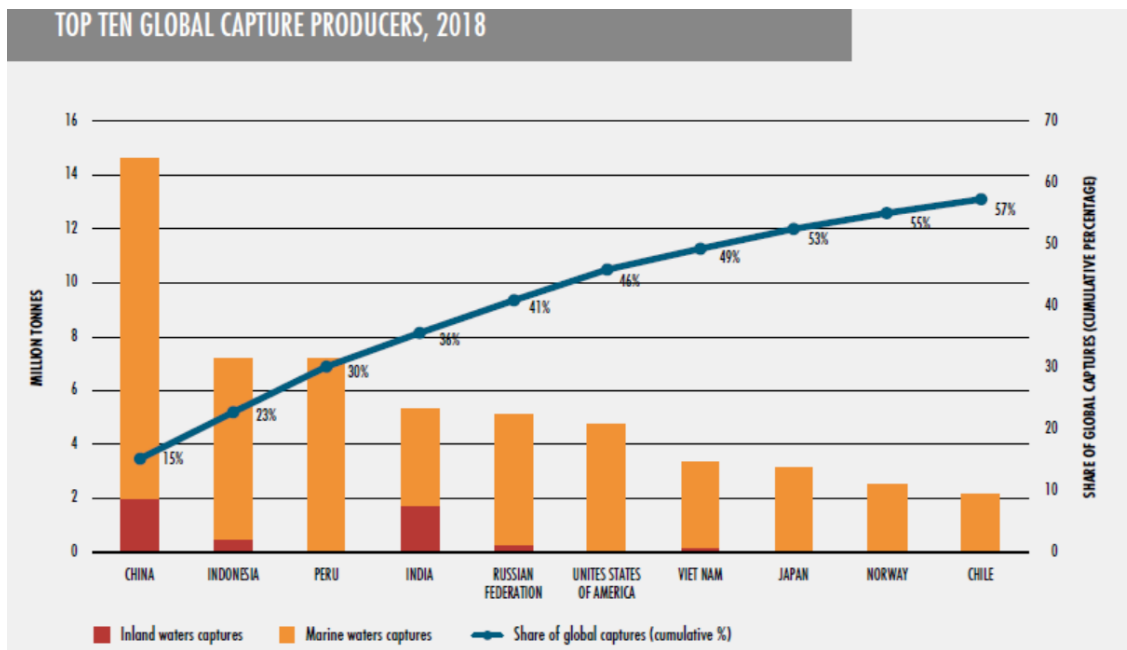


MArine capture Production: In 2018, the top 7 producers were responsible for over 50 percent of the total marine captures, of which China accounted for 15 percent of the world total, followed by Peru (8 percent), Indonesia (8 percent), the Russian Federation (6 percent), the United States of America (6 percent), India (4 percent), and Viet Nam (4 percent).

MARINE CAPTURE PRODUCTION: MAJOR PRODUCING COUNTRIES AND TERRITORIES

Country or territory	Production (average per year)			Production				Percentage of total, 2018
	1980s	1990s	2000s	2015	2016	2017	2018	
	<i>(million tonnes, live weight)</i>							
China	3.82	9.96	12.43	14.39	13.78	13.19	12.68	15
Peru (total)	4.14	8.10	8.07	4.79	3.77	4.13	7.15	8
<i>Peru (excluding anchoveta)</i>	2.50	2.54	0.95	1.02	0.92	0.83	0.96	–
Indonesia	1.74	3.03	4.37	6.22	6.11	6.31	6.71	8
Russian Federation	1.51	4.72	3.20	4.17	4.47	4.59	4.84	6
United States of America	4.53	5.15	4.75	5.02	4.88	5.02	4.72	6
India	1.69	2.60	2.95	3.50	3.71	3.94	3.62	4
Viet Nam	0.53	0.94	1.72	2.71	2.93	3.15	3.19	4
Japan	10.59	6.72	4.41	3.37	3.17	3.18	3.10	4
Norway	2.21	2.43	2.52	2.29	2.03	2.38	2.49	3
Chile (total)	4.52	5.95	4.02	1.79	1.50	1.92	2.12	3
<i>Chile (excluding anchoveta)</i>	4.00	4.45	2.75	1.25	1.16	1.29	1.27	–

China is top capture producer (including both inland and marine) which accounted for about 15 percent of total global captures in 2018, more than the total captures of the second- and third-ranked countries combined. **The top seven capture producers are: 1. China, 2. Indonesia, 3. Peru, 4. India, 5. Russian Federation, 6. United States of America and 7. Vietnam**



Top capture species:

Finfish: In 2018, catches of **Anchoveta (*Engraulis ringens*)** once again made it the top species, at over 7.0 million tonnes per year, after relatively lower catches recorded in recent years. **Alaska pollock (*Theragra chalcogramma*)** was second, at 3.4 million tonnes, while **skipjack tuna (*Katsuwonus pelamis*)** ranked third for the ninth consecutive year, at 3.2 million tonnes.

**TABLE 5
MARINE CAPTURE PRODUCTION: MAJOR SPECIES AND GENERA**

Species item	Production		Production			Percentage of total, 2018
	2004–2013 (average per year)	2015	2016	2017	2018	
Finfish						
Anchoveta, <i>Engraulis ringens</i>	7 276	4 310	3 192	3 923	7 045	10
Alaska pollock, <i>Gadus chalcogrammus</i>	2 897	3 373	3 476	3 489	3 397	5
Skipjack tuna, <i>Katsuwonus pelamis</i>	2 494	2 822	2 862	2 785	3 161	4
Atlantic herring, <i>Clupea harengus</i>	2 162	1 512	1 640	1 816	1 820	3
Blue whiting, <i>Micromesistius poutassou</i>	1 182	1 414	1 190	1 559	1 712	2
European pilchard, <i>Sardina pilchardus</i>	1 084	1 176	1 279	1 437	1 608	2
Pacific chub mackerel, <i>Scomber japonicus</i>	1 483	1 457	1 565	1 514	1 557	2
Yellowfin tuna, <i>Thunnus albacares</i>	1 239	1 377	1 479	1 513	1 458	2
Scads nei, ¹ <i>Decapterus</i> spp.	1 199	1 041	1 046	1 186	1 336	2
Atlantic cod, <i>Gadus morhua</i>	948	1 304	1 329	1 308	1 218	2

Crustacean: Top on the list is Natantion decapods followed by Gazami crab.

TABLE 9
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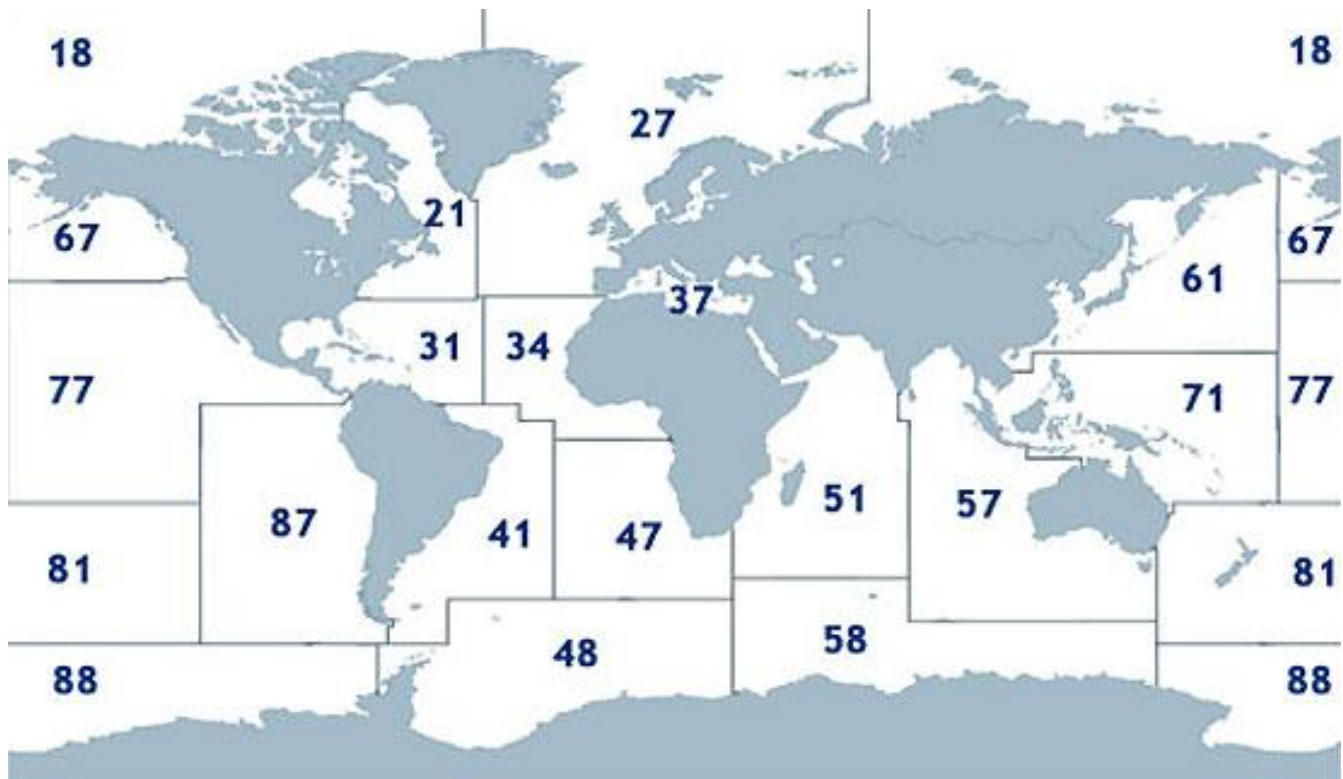
Species item	Production		Production			Percentage of total, 2018
	2004–2013 (average per year)	2015	2016	2017	2018	
<i>(thousand tonnes, live weight)</i>						
Crustaceans						
Natantian decapods nei, <i>Natantia</i>	784	825	879	975	850	14
Gazami crab, <i>Portunus trituberculatus</i>	383	561	523	513	493	8
Akiami paste shrimp, <i>Acetes japonicus</i>	585	544	486	453	439	7
Antarctic krill, <i>Euphausia superba</i>	156	251	274	252	322	5
Marine crabs nei, <i>Brachyura</i>	265	360	343	343	314	5
Blue swimming crab, <i>Portunus pelagicus</i>	175	237	259	302	298	5
Argentine red shrimp, <i>Pleoticus muelleri</i>	57	144	179	244	256	4
Southern rough shrimp, <i>Trachypenaeus curvirostris</i>	314	368	314	286	248	4
Others	2 735	2 819	2 722	2 659	2 776	46
Crustaceans total	5 454	6 109	5 979	6 027	5 997	100

Molluscs: Top on the list is jumbo flying squid (*Dosidicus gigas*).

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	2004–2013 (average per year)	2015	2016	2017	2018	
<i>(thousand tonnes, live weight)</i>						
Molluscs						
Jumbo flying squid, <i>Dosidicus gigas</i>	823	1 004	747	763	892	15
Marine molluscs nei, <i>Mollusca</i>	802	759	674	648	664	11
Various squids nei, <i>Loliginidae</i> , <i>Ommastrephidae</i>	641	693	629	655	570	10
Common squids nei, <i>Loligo</i> spp.	248	358	319	311	369	6
Cuttlefish, bobtail squids nei, <i>Sepiidae</i> , <i>Sepiolidae</i>	301	405	379	395	348	6
Cephalopods nei, <i>Cephalopoda</i>	382	388	394	433	322	5
Yesso scallop, <i>Patinopecten yessoensis</i>	309	243	224	247	316	5
Others	3 110	3 279	2 361	2 560	2 478	42
Molluscs total	6 616	7 129	5 728	6 012	5 959	100

World marine Fishing areas FAO divided the total marine fishing areas of the world into 19 parts out of 15 are major marine fishing areas and 4 are minor fishing areas for statistical purposes.



Fishing area 21, 27, 31, 34, 37, 41 and 47 comes under Atlantic Ocean and Medeterrian

Fishing Area 51 and 57 comes under Indian Ocean

Fishing Area 61, 67, 71, 77, 81 and 87 comes under Pacific Ocean

Fishing Area: 18, 48, 58 and 88 comes under Artic and Antartic Ocean

Another Classification of fishing area:

1. Temperate areas (areas 21, 27, 37, 41, 61, 67 and 81)
2. Tropical areas (areas 31, 51, 57 and 71)
3. Upwelling areas (areas 34, 47, 77 and 87)
4. Arctic and Antarctic areas (areas 18, 48, 58 and 88).

Catches in temperate areas continue to remain stable at between 37.5 million tonnes and 39.6 million tonnes per year following the two highest peaks in catches between 1988 and 1997 at about 45 million tonnes.

In tropical areas, the trend of increasing catches continued in 2017 and 2018, with catches in the Indian Ocean (areas 51 and 57) and the Pacific Ocean (area 71) reaching the highest levels recorded at 12.3 million tonnes and 13.5 million tonnes, respectively. In the Indian Ocean, catches have been increasing steadily since the 1980s, particularly in area 57, the Eastern Indian Ocean, with catches of small pelagics, large pelagics (tunas and billfish), and shrimps driving most of the increase. In area 71, the Western Central Pacific, tuna and tuna-like species accounted for most of the increase in catches, with

skipjack tuna in particular increasing from 1.0 million tonnes to over 1.8 million tonnes in the last 20 years.

Catches in upwelling areas are characterized by high annual variability. Their combined catches are highly influenced by catches in area 87, the Southeast Pacific, where El Niño oceanographic conditions strongly influence the abundance of Anchoveta. Such catches account for 50–70 percent of total catches in area 87. Annual catches have decreased from over 20 million tonnes in 1994 to between about 7 million tonnes and 10 million tonnes in recent years – driven by decreasing catches of two of the main species: anchoveta and Chilean jack mackerel (*Trachurus murphyi*).

The Antarctic fishing areas (areas 48, 58 and 88) reported their highest catches since the early 1990s, at 331 000 tonnes. Catches in the region are almost entirely driven by Antarctic krill (*Euphausia superba*), which increased from less than 100 000 tonnes in the late 1990s to 313 000 tonnes in 2018. Catch of the second-most important species, Patagonian toothfish (*Dissostichus eleginoides*), continued to be relatively stable at between 10 500 tonnes and 12 200 tonnes per year.

CAPTURE PRODUCTION: FAO MAJOR FISHING AREAS

Fishing area code	Fishing area name	Production (average per year)			Production				Percentage share
		1980s	1990s	2000s	2015	2016	2017	2018	
<i>(million tonnes, live weight)</i>									
Marine water captures									
21	Atlantic, Northwest	2.91	2.33	2.22	1.85	1.82	1.75	1.68	7
27	Atlantic, Northeast	10.44	10.39	9.81	9.14	8.32	9.33	9.32	41
31	Atlantic, Western Central	2.01	1.83	1.55	1.40	1.54	1.45	1.49	7
34	Atlantic, Eastern Central	3.20	3.56	3.76	4.45	4.88	5.41	5.50	24
37	Mediterranean and Black Sea	1.84	1.50	1.54	1.33	1.26	1.36	1.31	6
41	Atlantic, Southwest	1.78	2.25	2.15	2.44	1.58	1.84	1.79	8
47	Atlantic, Southeast	2.32	1.56	1.54	1.68	1.70	1.68	1.55	7
	Atlantic Ocean and Mediterranean total	24.50	23.41	22.57	22.29	21.09	22.82	22.64	100
51	Indian Ocean, Western	2.38	3.68	4.24	4.72	5.03	5.45	5.51	45
57	Indian Ocean, Eastern	2.67	4.13	5.48	6.35	6.41	6.92	6.77	55
	Indian Ocean total	5.05	7.81	9.72	11.07	11.44	12.37	12.28	100
61	Pacific, Northwest	20.95	21.80	19.97	21.09	20.94	20.24	20.06	41
67	Pacific, Northeast	2.74	2.98	2.79	3.17	3.11	3.38	3.09	6
71	Pacific, Western Central	5.94	8.51	10.78	12.74	12.99	12.73	13.54	28
77	Pacific, Eastern Central	1.62	1.44	1.81	1.66	1.64	1.75	1.75	4
81	Pacific, Southwest	0.57	0.82	0.69	0.55	0.47	0.47	0.45	1
87	Pacific, Southeast	10.23	14.90	13.10	7.70	6.30	7.19	10.27	21
	Pacific Ocean total	42.06	50.45	49.14	46.91	45.46	45.76	49.16	100
18, 48, 58, 88	Arctic and Antarctic areas total	0.48	0.19	0.14	0.24	0.28	0.26	0.33	100
Marine waters total		72.10	81.86	81.56	80.51	78.27	81.21	84.41	

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Fishing area code	Fishing area name	Production (average per year)			Production				Percentage share
		1980s	1990s	2000s	2015	2016	2017	2018	
<i>(million tonnes, live weight)</i>									
Marine captures by major fishing area									
	Temperate areas	41.24	42.07	39.16	39.57	37.49	38.37	37.69	45
	Tropical areas	13.01	18.14	22.05	25.20	25.98	26.55	27.31	32
	Upwelling areas	17.37	21.45	20.21	15.49	14.53	16.03	19.07	23
	Arctic and Antarctic areas	0.48	0.19	0.14	0.24	0.28	0.26	0.33	0
	Marine waters total: major fishing areas	72.10	81.86	81.56	80.51	78.27	81.21	84.41	100

For 2018 (Marine Capture Ocean wise)

Highest capture from Pacific Ocean: 49.16 mt

2nd highest from Atlantic Ocean & Mediterranean: 22.64 mt

3rd from Indian Ocean: 12.28

4th from Arctic & Antarctic Ocean: 0.33 mt

For 2018 (Marine Capture fishing area wise)

Highest from fishing area 61 (Pacific Northwest): 20.06 mt

2nd from fishing area 71 (Pacific Western central): 13.54 mt

3rd from fishing area 87 (Pacific Southwest): 10.27 mt

4th from fishing area 27 (Atlantic Northeast): 9.32 mt

For 2018 (Marine Capture fishing area wise)

Temperate: 37.69 mt

Tropical: 27.31 mt

Upwelling: 19.07 mt

Arctic & Antarctic: 0.33 mt

Marine Fishing area

Atlantic Ocean

Atlantic, Northwest (FAO Fishing Area 21): This area located south of 35°N is divided into 3 main regions i.e. 1) Canada, 2) United States 3), and Green Land.

Major species:

1. Cod (*Gadus morhua*)
2. Haddock (*Melanogrammus aeglefinus*)
3. Red fish (*Sebastes* spp.)
4. Silver hake (*Merluccius bilinearis*)
5. Flounders (include several species of flat fishes)
6. Herring (*Clupea herengus*) inshore fishery
7. Other fishes (include a variety of sharks, sword fish, tuna and hakes)
8. Molluscs & Crustaceans

Atlantic, Northeast (FAO Fishing Area 27): The area treated here is north east of the latitude 36°N in the South. The region is conveniently marked into three major areas i.e. 1) Baltic, 2) North Sea, and 3) Iceland.

Atlantic, Western Central (FAO Fishing Area 31): This area centred on the Caribbean and Central American state (50 N to 420 N East ward) has recorded 147 species. Major pelagic groups are herring, sardine, anchovies and menhaden. A substantial increase in landing of tuna, bonito, billfishes, yellow fin and Spanish mackerel are seen. The fisheries for crustaceans are dominated by Caribbean lobster and penaeid shrimps. Several mollusc species also support valuable fisheries in the area. Many groupers and spiny lobsters in the area are over exploited. The most important commercial fisheries are hook and line and trap for snappers and groupers.

Atlantic, Eastern Central (FAO Fishing Area 34): The west coast of Africa and Gibraltar strait encompasses temperate, tropical and equatorial waters, lagoons as well as major currents, upwelling and equatorial convergence. About 190 species are caught in the area. Fisheries in the region are characterised by small pelagic species especially sardine and other clupeids (herring and anchovies) account for nearly 50% of the catch. Horse mackerel, jacks, mullets and sauries, tuna, bonito, billfishes, skipjack and yellowfin are other varieties. Shrimps, squids, cuttlefishes and octopus represent 7% of the total catch.

Mediterranean and Black Sea (FAO Fishing Area 37): This area is almost land locked water mass connected to the east Black sea. Between the Black Sea and Mediterranean, there is a surface current carrying low salinity water into the Mediterranean and an under current of high salinity water in the Black Sea. Freshwater discharge is important in the Black Sea and Mediterranean, the major discharge has been from the Nile. The Mediterranean Sea is one of the marine areas of the world's ocean showing a steady increase in production for all major source categories; but of comparatively low quantities. Pilchard, anchovy, mackerel and bonito are of commercial importance. Large pelagic species such as blue fm and bonito also show an increase in catch. Growing share of molluscs, shrimps and other crustaceans are seen here. But there are also serious declines in the landings of valuable red coral and spiny lobsters and some important elasmobranch. Similar increase in landing applies to certain demersal species such as hake, angler fish, whiting, conger eel etc.

Atlantic, southwest (FAO Fishing Area 41): This area covers the eastern South American coast (70 W to 200 W). Major areas include Brazil, Uruguay and Argentina. Total fish production comes from demersals and more recently squids, cod, hake, red fish, basses and congers followed by small pelagics (sardine, herring and anchovies). Shrimps, lobsters and other crustaceans are regulated by closed seasons.

Atlantic, Southeast (FAO Fishing Area 47): This area extends from 6° S to 30° E (Cape of Good Hope, South of Durban). An important fishing ground is Agulhas Bank. Angola, Namibia and South Africa are the major fish producing countries. Here the Benguela current brings the nutrient rich upwelling system along the west coast of South Africa. Three major fisheries are distinguished in the area. They include shoaling pelagic fishery (Pilchard and anchovies), trawl fishery (Cod, haddock and hakes with jacks, mullets and sauries) and rock lobster and mussel fishery. The pelagic fisheries in the region are affected by decline in sardine abundance in the north and anchovies in the south, while trawl fishery is affected by decline in hake abundance. Other major contributors of the landing are spiny lobster and molluscs. In addition to this, a number of minor fisheries are also reported.

Pacific Ocean

Pacific, Northwest (FAO Fishing Area 61): This includes high productive areas of South China Sea, east China Sea, the Yellow Sea, the Sea of Japan and Sea Okhotsk that are characterized by pronounced seasonal changes and zones of enrichment with ocean currents. The total catches of North West Pacific increased steadily from 1950 to 1980 by the expansion of two species mainly Alaskan Pollock and Japanese Pilchard. However, they collapsed in 1990's due to the strong rise in landings of other species like Japanese anchovy, large head hairtail, Japanese flying squid and salmon. The rise in landings of chub mackerel and jack mackerel are also reported. Significant contributions are made by the Pacific herring, Pink salmon and various crustacean species.

Pacific, Northeast (FAO Fishing Area 67): This area extends from Northern California (42° N) to the Gulf of Alaska and eastern part of Bering Sea. The most abundant species in landing is Alaskan Pollock and sock eye salmon. Large reduction in catch occurred for Pacific halibut, Pacific Ocean perch, snow crab and shrimps. Many of the most important ground fish stock also followed same pattern of rapid increase initially, then a decline. The shoaling pelagic fishes like pilchard and anchovies and trawl fishery for cod, jack, mullets, sauries and hakes and rock lobster are also fully exploited.

Pacific, Western Central (FAO Fishing Area 71): This area extends from the seas of South East Asian countries down to North East Australia and further to East Pacific. The area is dominated by large continental shelf, which lies in the EEZ of Indonesia, Malaysia, Philippines, Thailand and Vietnam. The shelf-area is rich in Penaeid shrimp and oceanic waters with rich tuna resources (skipjack and yellow fin tuna). The development of fisheries has been influenced by the global market. But the level of knowledge of the status of the resource is inadequate. Shrimps are the major coastal fisheries with banana prawn as the most valuable species. There could be potential for development of cephalopods in Thailand, Indonesia and Vietnam waters. The total catches in the area have increased and there are indications of overfishing. Even though various management measures have been introduced like closed season, mesh size regulation etc., the fishing pressure is kept on increasing.

Pacific, Eastern Central (FAO Fishing Area 77): The area covers northern California (42° N), USA to Southern Panama. The region is under the influence of two major surface current systems, the California current in the north and Equatorial current in the south. Interaction between the current systems generates upwelling and these characteristics strongly influence the distribution and abundance of fishery resources and fishing activities. Fishing for small and large pelagics is important around the major upwelling areas. Shrimps and demersal sustain in the tropical areas of Mexico, Central America and Panama. The biggest fishery in the region has been Californian sardine of USA (*Sardinops sagax caeruleas*). There is blooms and collapse followed by the rise in the anchovy (*Engraulis mordax*). The catches of Pacific anchoveta and thread herring are also highly variable in Panama. Other main pelagic species is the jack mackerel (*Trachurus symmetricus*). Tunas and other large pelagics are also important in Mexico and USA, Venezuela, Japan, Republic of Korea and other Asian countries. The main species are yellow fm tuna (*Thunnus albacores*), big eye (*Thunnus obesus*), skipjack (*Katsuwonus pelamis*) and albacore (*Thunnus alalunga*). Shrimps and prawns sustain valuable fisheries throughout the area. Currently, the jumbo flying squid (*Dosscidius gigas*) is identified as good resource in the area. Tuna and squids are exploited by different nations.

South Pacific Island (FAO Fishing Area 71 and 77): This region includes Micronesia, Polynesia and Melanesia. The island countries of Papua New Guinea rely heavily on this area. There are three main

types of fisheries like industrial fisheries mainly for tuna, coastal small scale fisheries for export and coastal fisheries for domestic consumption. Fishing is carried out mainly by the distant water fishing nations like China, Indonesia, Japan, Korea, Philippines, Taiwan and USA on payment basis to gain access to the EEZ. Tunas are the target for industrial fisheries. Besides tuna, there is small scale trawl fishery for shrimps. Tuna fisheries in the South Pacific could probably sustain an increase over the current total, provided fishing effort is well managed.

Pacific, Southwest (FAO Fishing Area 81): This area extends between 10° S to 60° S enclosing Tasman Sea and Pacific ocean to 105° East Meridian. The type of habitats exploited in this area most varied from coastal continental fisheries to deep-water sea mount fisheries. NewZeland has been a pioneer in deep-water (> 600 m) trawl fisheries. The fishery consists of coastal species of Australian states, pelagic resources of South Western Pacific and deep waters species of NewZeland. Most important single species fisheries are crustaceans (Red rock lobster of NewZeland) and prawns of Australia. Other species like cod, hakes, haddock, blue whiting and blue grenadier are varied in the landings. The species showing greatest variation in the landing is of green back horse mackerel. Being a country with state federal structure, Australia has two levels of fisheries management viz. state controlled territorial waters (up to 3 miles offshore) and the common wealth government controlled resources in the offshore up to 200 miles.

Pacific, southeast (FAO Fishing Area 87): This area covers the area along the western coast of South America from Northern Columbia to Southern Chile. Best and most productive trawling areas are in the Northern Peru and Southern Chile. The distribution and abundance of fishery resources are strongly influenced by the prevailing environmental condition. By far the major fishery in the area is for anchoveta (*Engraulis ringens*) the biggest single species fishery in the world. The recorded catch may vary from 10 to 12 million tonnes per year. Further more in the area, the anchoveta are mixed with sardine, hakes, shrimps, cephalopods, shellfish, sea birds and marine mammals. The adverse effect of El Nino on the abundance of Peruvian anchoveta is popular. The area is well known for large changes in resource abundance and species composition. Recent resource changes of particular relevance to the area is the depletion of South American sardine (*Sardinops sagax sagax*), the second most contributor to the total production. The Chilean jack mackerel and jumbo flying squid (*Dosidicus gigas*) are the major contributors of overall increase in landings. Highly migrated tunas (skipjack and yellow fin tuna, eastern pacific bonito) support coastal pelagic fisheries in the area. Squid catch also increased in this region.

Indian Ocean

Indian Ocean, western (FAO Fishing Area 51): It has a surface area of 30 million km² and encompasses regions with greatly differing fishery resources. The monsoon induced upwelling brings high nutrients and support traditional fisheries and create unique situation in the North West Arabian Sea. The Gulf of Oman, Iran, Pakistan, Persian Gulf of Aden and Somali coast are also benefited by high productivity. The Seychelles and Mauritius have their own characteristic fisheries. Further to South Africa, the fisheries are of temperate and Antarctic nature. The enormous number of small fishing vessels in the area makes monitoring of the stock status difficult in the Eastern Arabian Sea (Pakistan, India and Srilanka). The Persian Gulf of Oman fisheries concentrate mainly on pelagic species like tunas. Most of the stocks of the region are fully exploited. The key sources of concern in the area are those of Spanish mackerel, penaeid and metapenaeid shrimps and various percoid fishes. Red sea, Gulf

of Aden, Saudi Arabia had regionally important shrimp fisheries and species associated with coral reefs and pelagic fisheries. **Coastal east Africa (Somalia to Mozambique):** East coast Africa represents wide range of marine ecosystem in the world. The coastal upwelling induced by the Somali current influences the total landings. Here the oceanic species like tuna constitutes 90% of the total landings. The distant water fishing fleets of Europe and East Africa harvest the oceanic species.

Eastern Indian Ocean (FAO Fishing Area 57): The area includes Bay of Bengal in the north to Andaman sea, Malacca strait in the east and waters around south of Australia. The fisheries of Eastern Indian Ocean are characterised by increased fishing pressure in the inshore area. The species like red fishes, herring, jacks, mackerel, tuna and shrimps account for major share in the total landings. Catches from the coastal fisheries like tuna (skipjack and yellowfin tuna) and shrimp are the main export commodities. Over exploitation has reduced the amount of export from capture fisheries. Only Thailand produces relatively high catches of squid. **Southern Area:** The main fishery in the Eastern Indian Ocean is the lobster fishery of Australia. Australia has also promoted the management of southern bluefin tuna. The trends in landing of herring, miscellaneous fishes and scallop indicate dwindling.

Southern Oceans

Southern Oceans (FAO Fishing Area 48, 58 and 88): The southern ocean system is dominated by krill (*Euphausia superba*). The greatest importance of southern ocean is for whale fishing upto 1960. There after the fishery shifted to whale's food i.e. krill. Krill landing increased rapidly from 1977 to 1983. It reached a peak in 1986 and collapsed since then due to poor profitability and demand. Patagonian tooth fish is also an important component in the commercial catch.