

CHARACTERISTICS AND DEVELOPMENT TRENDS IN FISH PRODUCTION IN THE WORLD

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Abstract

Fishery represents a very important production in entire agricultural production in the world. It includes primary production which is made of freshwater fishing and marine fishing as well. A number of factors (ecological, economic etc.) influence on trends and development of fishery. Production from inland waters–freshwater fishery, provides significant part of a diet for a large number of populations in the world, especially in the developing countries. According to Food and Agriculture Organization (FAO) estimates, over 55 million people are employed in this sector, with a part time or a full time job, in a primary fish production or in its catching. Human influence on ecosystems in a form of pollution, fragmentation of a habitat and changes in biological cycles due to floods, reduce ability to recover from the pressures on fish catching. In recent decades along with development of fishing technology and the use of modern means for fish harvesting in the seas of the world, there has been an intensive exploitation with negative implications on the sustainability of the world fish stocks. More than three quarters of global fish production is used for human consumption, while the rest is used as an animal food in pharmaceutical industry and so forth.

Key words: *fishery, competitiveness, production, market, agricultural policy*

Introduction

Fish production in the world had an increasing trend in the recent decades and it represents one of the dynamic sectors in food production. However, intensive fish harvesting in the seas of the world influenced that so far we used a bit more than a half of all fish stocks approaching the maximum of all sustainable limitations, with the significant reduction in space for further expansion. Fish meat is an important of proteins, minerals, vitamins, essentials fatty acids etc. Total fish production in the world is on the average at about 137 million tons. World's oceans and seas provide approximately about 70% worlds catches, while the inland waters surpassed 30 million tons, which presents at about 30 % of total fishing production. China, Peru, Indonesia, the USA, India, Russia and Japan are the leading countries in fish harvesting, while aquaculture i.e. fish production is dominated by China, India, Bangladesh, Thailand and Norway. Over 90% of entire world catch include marine fish, and the most important species are: hake, tuna, mackerel, herring, cod. At about 10% of the world production which comes from the fish ponds presents rainbow trout, carp and catfish, grass carp and silver carp from open waters. Developing countries make more than three quarters of the world's fishery production and almost a half of world's export. World fish consumption per capita is constantly increasing from an average 9.9 kilos in the 1960's up to 18.8 kilos in 2011. Because of sensitivity of fish product deterioration, especially live and fresh fish, more than 90% of world trade refers to some form of processed fish. The proportion of live, fresh or iced fish in the world trade makes at about 10% with tendency of growing. The biggest world's fish exporters

are China, Norway, Thailand, Vietnam and the USA, and importers are the USA, Japan, China, Spain, France and Italy.

Materials and methods

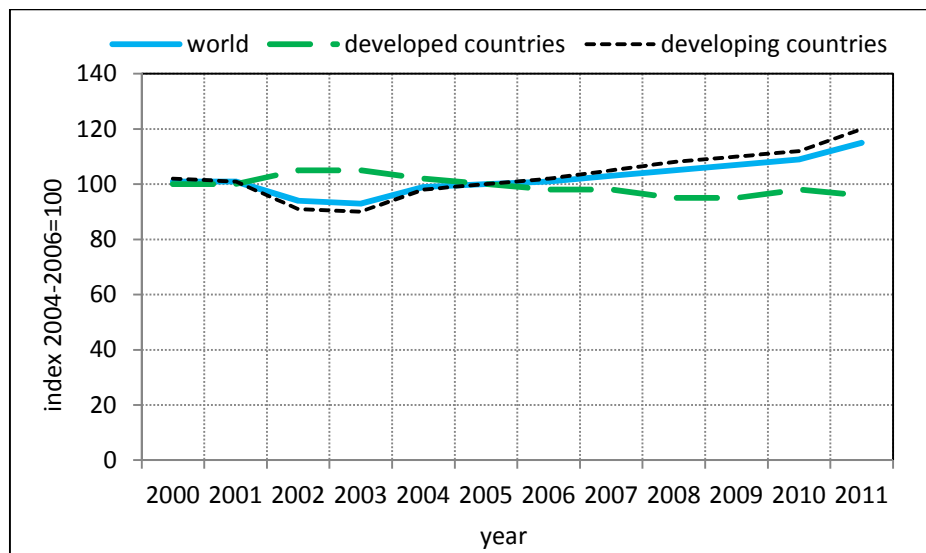
The defined goals of this research were carried out with the use of different methodological procedures. The methods of descriptive statistics were used for the fish production analysis in the world. Descriptive statistics analysis includes methods of collecting, sorting and displaying data as well as methods of assessment of the specific indicators that are relevant for description and explanation of the changes for observed features. Basic data sources are taken from the United Nation FAO Database. The research is based on available data for a defined period of time. Relevant data were grouped and processed by applying statistical and mathematical methods and displayed through tables and charts. The comparative method of analysis is applied. We used the available literature which deals with the issues of fish production and its main features.

Results and discussion

The significance and tendencies of fishery production in the world

Fish production has significantly increased in the last few decades. In the period from 2000 to 2011, this sector has recorded growth, especially after 2003. (Chart 1). The development of this sector has great importance for entire food production and nutrition of the population. More than a half of all fish supplies in the world is completely exploited so far, approaching close to maximum of all sustainable limitations, with the reduction of space for further expansion. Fish meat is very important source of proteins, minerals, vitamins, essentials fatty acids etc. Fishery, directly or indirectly, plays a very important role in life and existence of a large number of people around the world.

Chart 1. Tendencies of fishery production in the world from 2000 to 2011.



According to FAO estimates, about 55.3 million people are employed in this sector, with a part time or a full time job, in a primary fish production or in its catching. In the last three decades, number of employees in the fishery increased faster than world's population and employment in traditional agriculture.

In 2011, fishery production reached the level of about 156 million tons in total value of over \$135 billion, of which approximately 132 million tons are used for human consumption (FAO). The oceans and seas provide nearly 90% of the world catch while the catch of the

inland waters surpassed 55 million tons. Over 90% of total world catch make marine fish, and the most important species are: hake, tuna, mackerel, herring and cod. At about 10% of world's production from fish pond make rainbow trout and carp and from open waters there are catfish, grass carp and silver carp. The developing countries made 82% of world fish production and 53% of world export in 2011. A large part of the export from the developing countries aims to supply developed countries which have growing demands and domestic production stagnation in fishery.

Table 1. Fish production in the world from 2000 to 2011. (millions of tones)

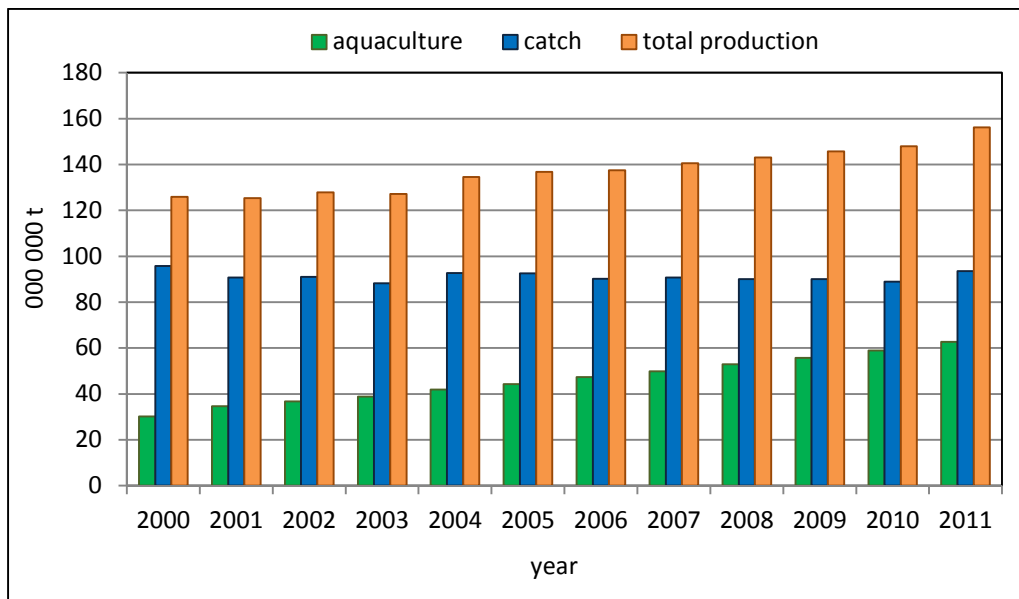
Year	Catch of fish	Index 200=100	Share in total production (%)	Aquaculture	Index 2000=100	Share in total production (%)	The total fish production	Index 2000=100
2000.	95.7	100	76.0	30.2	100	24.0	125.9	100
2001.	90.7	95	72.4	34.6	114	27.6	125.4	99
2002.	91.0	95	71.2	36.8	122	28.8	127.8	102
2003.	88.3	92	69.4	38.9	129	30.6	127.2	101
2004.	92.7	97	68.9	41.9	139	31.1	134.6	107
2005.	92.5	97	67.6	44.3	146	32.4	136.8	108
2006.	90.2	94	65.6	47.3	156	34.4	137.5	109
2007.	90.7	95	64.5	49.9	165	35.5	140.6	112
2008.	90.1	94	63.0	52.9	175	37.0	143.0	113
2009.	90.0	94	61.8	55.7	184	38.2	145.7	116
2010.	89.0	93	60.1	59.0	195	39.9	148.0	117
2011.	93.5	98	59.9	62.7	208	40.1	156.2	124
average	91.2	-	66.7	46.2	-	33.3	137.4	-

Source: FAO, Database, Rome.

According to analyzed data for the period from 2000 to 2011, an average of 137.4 million tons of fish was produced in the world. An average production in aquaculture was 46.2 million tons, while the catch was at the level of 91.2 million of tons (Table 1). Looking at the dynamic of changes in the actual fish production, strong growth of fish production in aquaculture can be seen i.e. it was doubled in 2011 comparing to 2000 and increased from 30.2 million tons to 62.7 million tons. In terms of actual tendencies to catch fish, we can conclude that there has been stagnation and reduction without any significant developmental progress throughout the period.

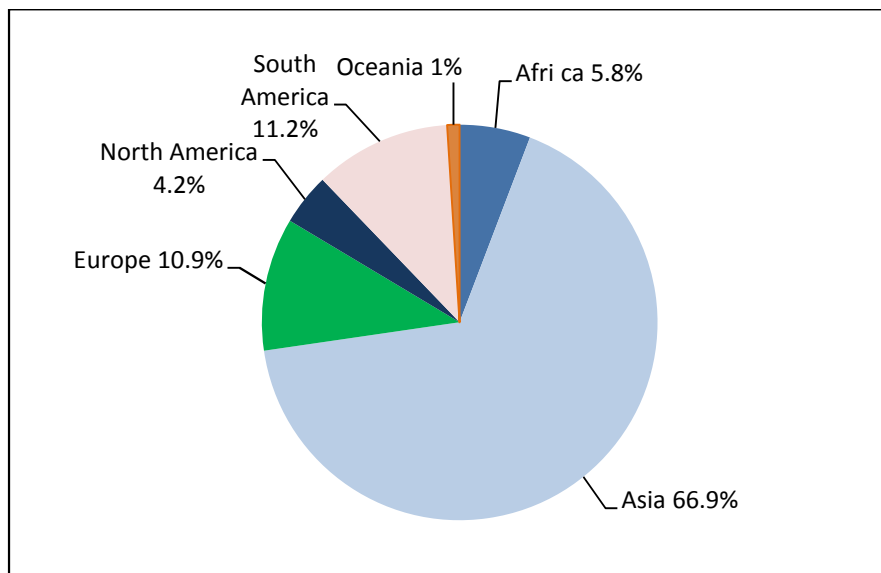
When it comes to the actual fish production and when we observe it through the production index we can note that it had stable upward trend in all these years. In terms of structure of achieved production in analyzed period, the average production achieved by catch was 91.2 million tons, which represents 66.7% of total production, while the aquaculture production was at an average level of 46.2 million tons which make 33.3% of total global production.

Chart 2. Dynamic of fish production in the world from 2000 to 2011.



In terms of distribution of total fish production by continents, Asia comes first with the production of 97.4 million tons, followed by South America with 16.2 million tons, Europe with 15.8 million tons, Africa with 8.4 million tons, North America with 6.1 million tons and Oceania with 1.4 million tons. From the position of participation in total world production, Asia participates with 66.9%, South America with 11.2%, Europe with 10.9%, Africa with 5.8%, North America with 4.2% and Oceania with 1.0%.

Chart 3. Structure of fish production in the world by continents from 2008 to 2011.



China has the largest fish production in the world. The second biggest fish catch is Peru with 6.4 million tons and the third is Indonesia with 5.4 million tons followed by the USA, India, Russian Federation and Japan (Table 2).

In terms of achieved fish production in aquaculture, China is the leading country with the average production of 36.7 million tons, the second is India with at about 4.0 million tons, the third ranked is Vietnam with an average of 2.6 million tons, followed by Indonesia, Bangladesh, Thailand and Norway. A global leader in fish production is China and it is

definitely in the first place by a catch of marine and freshwater fish and aquaculture while all Asian countries make 52% of global production.

Table 2. The biggest fish producers in the world from 2009 to 2011.

Countries	2009.	2010.	2011.	Average
Catch of fish in tons				
China	14 919 596	15 417 011	15 772 054	15 369 553
Peru	6 914 452	4 261 091	8 248 482	6 474 675
Indonesia	5 103 608	5 380 196	5 707 684	5 397 163
USA	4 222 052	4 425 961	5 153 452	4 600 488
India	4 066 756	4 689 316	4 301 534	4 352 535
Russian Federacija	3 826 129	4 069 624	4 254 864	4 050 206
Japan	4 091 314	4 069 135	3 761 176	3 973 875
Aquaculture in tons				
Countries	2009.	2010.	2011.	Average
China	34 779 870	36 734 215	38 621 269	36 711 785
India	3 791 920	3 785 779	4 573 465	4 050 388
Viet Nam	2 556 080	2 671 800	2 845 600	2 691 160
Indonesia	1 733 434	2 304 828	2 718 421	2 252 228
Bangladesh	1 064 285	1 308 515	1 523 759	1 298 853
Thailand	1 416 668	1 286 122	1 008 049	1 236 946
Norway	961 840	1 008 010	1 138 797	1 036 216

Source: FAO, Database, Rome

China is by far the largest overall fish producer with an average production of 52 million tons (15.3 million tons of fish catch and 36.7 from aquaculture), providing about 29.4 kg of fish per capita, as well as significant production for export.

Norway is among the first when it comes to fish catching per capita and fish products, while in Japan the fish is the most important in the diet with consumption of over 54 kg per capita per year. In terms of fish production in the world Asian-Pacific region dominates, which makes about 89% of production in terms of quantity and 77% of its production value. This domination is mostly based on the huge production of China which makes 34% of total world production in terms of quantity and 49% of its production value. China achieves 77% of total world carp production, while Chile and Norway are two leading world producers of cultivated salmonids, with about 33% of world production.

World fishery is increasingly faced with certain limitations in its development. Eutrophication from excessive intake of phosphorus and nitrogen through the sewerage and polluted waters of agricultural areas represent a great danger for freshwater and marine fishing. Coastal areas which have less oxygen so-called “dead zones” often coincide with the areas of intensive agricultural production. Eutrophication combined with unsustainable fishing leads to loss or reduction of fishing resources in general. Current projections show that for the fish production, previous growth is unlikely to be sustainable in the future mainly due to limitations in availability of marine fish. In certain regions, such as certain parts of Africa and South-east Asia, increase in production and harvesting of fish as well as expanding areas under arable land, are the main factors for increase in food supply. We should point out that fishery products are the main source of energy and proteins for poor coastal population, especially in West Africa and South-east Asia and that every reduction in fish production will have a great impact on lives of a large number of populations in these zones. A high level of exploitation indicates that the maximum potential of the world’s marine fishing is achieved and that we must take measures and activities aimed at reducing excessive harvesting of fish. (Asche, et al., 2008).

Regardless of economic and social importance that fishery has, attempts of sustainable management are insufficiently successful in many parts of the world and it is necessary to take

certain measures in order to find sustainable solutions. Imbalance of fishing ecosystem on one hand, as well as provision of food, income and livelihood of fishing on the other hand, require appliance of sustainable approaches to solving these problems (Brugère i Hishamunda, 2007). Combination of measures directed towards protection of fish ecosystems should include a ban of certain fishing practices, the establishment of marine protected areas for harvesting of fish, limiting the rights of access, improving the system of licenses and quota etc.

Freshwater fishery production provides main part of the diet of many people throughout the world, especially in developing countries. Human influences on ecosystems-in a form of a pollution, habitat fragmentation and changes in biological cycles due to floods, reduce the ability to recover from the pressures of fishing, so in this segment it is necessary to take measures to control the exploitation of these resources.

Conclusion

Fishery production has a great significance for total food production and nutrition of population. Nowadays more than a half of all food supplies in the world is totally exploited, and that to a great extent complicate future development of this production. This production reached the level of 156 million tons in 2011, of which about 132 million tons are used for human consumption. The average production of aquaculture from 2000 to 2011, the period we analyzed, was 46.2 million tons while the catch was at the level of 91.2 million tons. In terms of the structure of achieved production, the average production achieved by the catch, participated with 66.7% of total production, while the production of aquaculture was 33.3% of total world production. Developing countries made 82% of world fish production in 2011. China is the leading world producer, with the average production of 52 million tons, of which 15.3 million tons include fish catch and 36.7 include aquaculture, followed by Peru, Indonesia, the USA, India, Russian Federation and Japan. In the following period it is necessary to find sustainable solutions for exploitation of fish ecosystem because with the stronger pressures it comes to its devastation which can have unforeseeable consequences in the entire value chain of fishery production.

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