



Yüzüncü Yıl Üniversitesi
Tarım Bilimleri Dergisi
(YYU Journal of Agricultural Science)

<http://dergipark.gov.tr/yyutbd>



Araştırma Makalesi (Research Article)

Analysis of Fisheries Support Estimate for Sustainable Blue Economy

Özlem TOPLU YILMAZ^{1*}

¹Istanbul Yeni Yüzyıl Üniversitesi, İktisadi ve İdari Bilimler Fakültesi, Uluslararası Ticaret ve Lojistik Bölümü, İstanbul

¹<https://orcid.org/0000-0001-5335-8370>

*Sorumlu yazar e-posta: ozlem.yilmaz@yeniuyuzil.edu.tr

Article Info

Received: 03.03.2020

Accepted: 08.09.2020

Online Published 31.12.2020

DOI: 10.29133/yyutbd.698092

Keywords

Blue Economy,
Fisheries Support,
Sustainability,
WTO Doha Round.

Abstract: The Blue Economy concept was firstly introduced after 2008 Mortgage Crisis, and gained importance in the United Nations Sustainability Conference held in Rio in 2012. In this study, the concept and the scope of the blue economy are given, and the fishing activity, which is one of the crucial blue economy components, is emphasized. According to the Food and Agriculture Organization (FAO) reports, fish stocks are decreasing due to overfishing in the world. It has been suggested that fisheries support is leading to overfishing and to the reduction of fish stocks. The purpose of this study is to analyze whether fisheries support causes overfishing and whether it is a problem for sustainable fish resources. In the Python program, a production model was estimated to analyze the relationship between fisheries production and fisheries support, the number of vessels and the number of fishermen in 37 countries between the years 2012 and 2017. According to the model, it was observed that the fisheries support, the number of vessels and the number of fishermen increase fish production, but there is not a high correlation between the variables. In order to remove the overfishing pressure on fish production, it is important to shift the fisheries support to the support types which are indirectly related with the fish output.

Sürdürülebilir Mavi Ekonomi için Balıkçılık Desteklerinin Analizi

Makale Bilgileri

Geliş: 03.03.2020

Kabul: 08.09.2020

Online Yayınlanma 31.12.2020

DOI: 10.29133/yyutbd.698092

Anahtar kelimeler

Mavi Ekonomi,
Balıkçılık Destekleri,
Sürdürülebilirlik,
DTÖ Doha Turu.

Öz: Mavi Ekonomi kavramı ilk kez 2008 Mortgage Krizi sonrasında ortaya atılmış, 2012'de düzenlenen Birleşmiş Milletler Rio Sürdürülebilirlik Konferansında ise önem kazanmıştır. Bu çalışmada mavi ekonomi kavramı üzerinde durulmuş, kapsamı verilmiş ve mavi ekonomi bileşenlerinden biri olan balıkçılık üzerinde odaklanılmıştır. FAO (Gıda ve Tarım Örgütü) raporlarına göre dünyada aşırı avlanma nedeniyle balıkçılık stokları gittikçe azalmaktadır. Aşırı avlanmaya ve balık stoklarının azalmasına balıkçılık desteklerinin yol açtığı öne sürülmüştür. Bu çalışmanın amacı, balıkçılık desteklerinin aşırı avlanmaya neden olup olmadığı ve sürdürülebilir balık kaynakları için sorun teşkil edip etmediğini analiz etmektir. Bir programlama dili Python programında balıkçılık üretimi ile balıkçılık destekleri, tekne sayısı ve balıkçı sayısı arasındaki ilişkiyi ortaya koymak için 2012-2017 yılları arasında 37 ülkeyi içeren üretim modeli tahmini yapılmıştır. Modele göre balıkçılık desteklerinin, tekne sayısının ve balıkçı sayısının balık üretimini arttırdığı gözlemlenmiş ancak çok yüksek bir korelasyona rastlanmamıştır. Balık üretimi üzerindeki aşırı avlanma baskısı kaldırmak için, balıkçılık desteklerinin doğrudan üretimle ilişkili olmayan destekleri ön planda tutmak, sürdürülebilir deniz kaynakları açısından önemli olduğu sonucuna varılmıştır.

1. Introduction

The term “Blue Economy” was firstly mentioned after 2008 Mortgage Crisis and was seen as a sea-based solution strategy for the global economic recession (Çoban, 2017). The concept of Blue Economy was introduced for the first time in the book "The Blue Economy" written by Gunter Pauli (2010) and emphasized that the Blue Economy creates richness in terms of sustainability and therefore a balance should be established between environmental and economic targets.

At the United Nations Conference on Sustainable Development (UNCSD) held in Rio de Janeiro on 20-22 June 2012, the main focus themes were “Sustainable Development and the advancement of the Green Economy”. But many coastal countries stated that the “Blue Economy” was more appropriate for their sustainable development approach than the Green Economy concept.

The blue economy concept aims to promote economic growth, the improvement of livelihood of those who earn their livelihood by sea, also aims to ensure environmental sustainability of oceans and coastal areas.

The definition of “ocean economy” has been also used by the countries which include ocean-related economic activities, but these activities vary for each country. As the oceans are seen as the source of growth and investment, the terms “blue economy” and “blue growth” emerged as part of the expression of the ocean economy (The Economist, 2015).

Blue economy covers many activities like fish production, coastal tourism, producing resources for medicine, also extracting renewable resources, marine transport, shipbuilding etc. This article focuses on only fish production which is an important component of blue economy for sustainable ocean and sea resources. The purpose of this study is to analyse the blue economy and the impact of the fisheries subsidies on over fishing, because it is suggested that fisheries support and over fishing are obstacles to sustainable blue economy.

2. Materials and Methods

The possible impacts of support level, number of vessels and employment in the fishing sector on the fish production level are examined in a panel of 37 countries covering 2012 through 2017 (Table 1). The impact of the number of vessels and the number of fishermen is also analyzed, but the main focus of the study is the relationship between the fisheries support and the fish output. The data are collected from the OECD.Stat, the Statistical Website of the OECD.

Panel data analysis is made in Python which is a multi-purpose programming language. Panel data results are obtained by writing Python code and running it in the program.

Table 1. The List of the Countries

OECD Countries				Non-OECD Countries:	
1	Australia	15	Latvia	28	Argentina
2	Belgium	16	Lithuania	29	Brazil
3	Canada	17	Mexico	30	China (People's Republic of)
4	Chile	18	Netherlands	31	Colombia
5	Denmark	19	New Zealand	32	Costa Rica
6	Estonia	20	Norway	33	Indonesia
7	France	21	Portugal	34	Malaysia
8	Germany	22	Slovenia	35	Peru
9	Greece	23	Spain	36	Philippines
10	Iceland	24	Sweden	37	Chinese Taipei
11	Ireland	25	Turkey		
12	Italy	26	United Kingdom		
13	Japan	27	United States		
14	Korea				

2.1. Blue economy concept and blue economy growth in the world

Blue economy is suitable for all countries and can be applied in many ways. Oceans make up of 72% of the world's surface and they provide a substantial portion of the global population with food and livelihoods and are the means of transport for 80% of global trade; also the seabed currently provides 32% of the global supply of hydrocarbons with exploration expanding (United Nations, 2014).

The basis of the global blue economy concept is to provide economic growth from the oceans while at the same time providing healthy oceans to serve the next generations. (Atakpa, 2018). As the oceans and the seas cover many activities, sustainable use of the oceans' and seas' resources are crucial for our future. The sustainability in oceans is not only crucial for the people who earn their livelihood from these resources, but also for all consumers, and for existence of biodiversity. An important aim of the blue economy comprises how the sectors related with the oceans and the seas will transition to more environmental-friendly activities.

Blue economy comprises many sectors like harvesting and trade of marine living resources, use of renewable natural forces, extraction of energy sources and minerals, commerce in and around the oceans like tourism, shipbuilding etc. (Table 2).

Table 2. Components of blue economy

<i>Type of Activity</i>	<i>Subcategory (related sector)</i>
Harvesting and trade of marine living resources	Seafood harvesting (Fisheries-primary fish production)
	Fisheries related activities (net and gear making, boat construction, ice production)
	Trade of non-edible sea-products (for cosmetic, pet, and pharmaceutical products)
Extraction and use of marine nonliving resources (non-renewable)	Extraction of minerals, energy sources (oil and gas) Freshwater
Use of renewable non-exhaustible natural forces (wind, wave, and tidal energy)	Generation of (off-shore) renewable energy
Commerce and trade in and around the oceans	Shipping and shipbuilding
	maritime transport
	costal urbanization
	tourism
Indirect contribution to economic activities and environments	Carbon sequestration
	Coastal Protection (habitat protection)
	Waste Disposal for land-based industry
	Existence of biodiversity (protection of species)

Source: World Bank, 2016: 1.

Seafood harvesting (fish production) is one of the main components of blue economy that is directly related with sustainability. The driver of the importance and growth in sea food harvesting is the demand for food, especially for protein. The sector also provides secondary activities related to marine fisheries like fish processing, packaging and marketing. In many places, employment enables young people to stay in their communities and have strengthened the economic viability of isolated areas, enhancing the status of women in developing countries (World Bank, 2017)

The biggest producer in seafood harvesting (fish production) in the world is China with 64 million tonnes. The fish production has been decreasing over the years especially in Belgium, France, Japan, Lithuania, Portugal, United States, Malaysia, Costa Rica, Philippines and Chinese Taipei (Table 3). Also, in other countries, there has not been a stability in world fish production over the years.

As seen in the Figure 1, the percentage of stocks fished at biologically unsustainable levels reached its maximum levels to 33% in 2008, then decreased to 28% in 2011, but later increased to 33% in 2015.

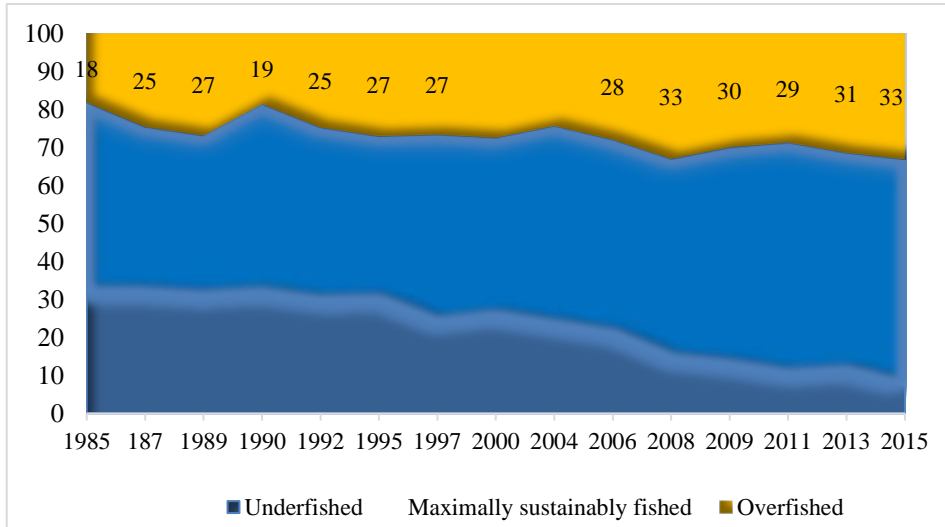


Figure 1. World fish stocks,1985-2015 (FAO, 2018).

Table 3. World fish production quantity (tonnes)

	2012	2013	2014	2015	2016	2017
Australia	81 833	80 062	75 032	89 318	97 046	93 965
Belgium	277	212	214	82	44	75
Canada	184 910	168 015	139 732	187 374	200 765	191 616
Chile	1 075 547	1 045 718	1 227 359	1 057 742	1 050 117	1 219 747
Denmark	345 86	37 707	34 382	35 867	36 337	37 498
Estonia	581	733	870	799	868	870
France	205 556	200 605	180 800	163 742	166 500	166 000
Germany	26 360	25 289	26 032	29 909	41 801	35 979
Greece	110 973	114 000	104 663	107 162	123707	125 574
Iceland	7 431	7 053	8 434	8 383	15 129	20 859
Ireland	36 102	34 198	31 200	39 650	40 244	45 433
Italy	137 041	140 879	148 730	148 763	157 000	157 000
Japan	1 073 821	1 027 951	1 021 849	1 105 652	1 067 995	1 021 580
Korea	1 509 226	1 533 446	1 567 442	1 676 485	1 859 220	2 306 280
Latvia	575	643	686	863	788	808
Lithuania	3 582	4 211	3 836	4 450	4 393	3 744
Mexico	143 747	111500	194 230	211 622	221 327	243 307
Netherlands	46 129	46 525	62 989	62 700	61 600	61 600
New Zealand	100 161	97 123	109 874	91 275	109 016	116 530
Norway	1 321 119	1 247 865	1 332 497	1 380 890	1 326 216	1 308 634
Portugal	10 318	10 067	11 339	9 563	9 787	9830
Slovenia	1 154	1 226	1 396	1 607	1 844	1 730
Spain	264 163	223 710	282 242	289821	283 831	311 032
Sweden	13 757	13 366	12 899	12020	15 747	14 793
Turkey	212 805	233 864	234 302	238 964	250 331	273 477
United Kingdom	205 595	203 263	214 707	211 749	194 492	222 434
United States	420 386	429 011	421 189	426 002	444 679	439 670
Non-OECD Economies						
Argentina	2 958	3 825	4 003	3 663	3 673	3 568
Brazil	480 880	477 752	564 230	575 230	590 730	595 000
China	52 082 586	550 29 058	57 320 504	59 368 942	62 318 378	64 358 481
Colombia	89 654	89 398	92 002	95 857	98 000	100 000
Costa Rica	27 287	30 352	26 766	22 503	20 820	20 820
Indonesia	9 599 765	13 301 408	14 375 287	15 649 311	16 002 319	15 896 100
Malaysia	634 876	530 702	521 014	506 965	407 887	427 516
Peru	72 293	125 693	115 271	90 976	100 187	100 455
Philippines	2 541 965	2 373 386	2 337 605	2 348 159	2 200 912	2 237 787
Chinese Taipei	347 900	348 916	341 373	314 013	255 651	283 025

Source: OECD, Fisheries Database, (2019).

There are three main sources of overfishing: increased number of vessels (fleet), increased number of fishermen, and high fisheries subsidies. According to the Figure 2, global fleet has increased from 694.000 in 2004 reaching a total of more than 1,4 million vessels in 2011 (OECD). The number of

fishermen in the sector has also grown faster after 2004 and reached its maximum level about 6 million in 2011. As the number of vessels and the number of fishermen recorded their highest levels in 2011, the sustainability of oceans was put on the agenda in the Rio Conference in 2012.

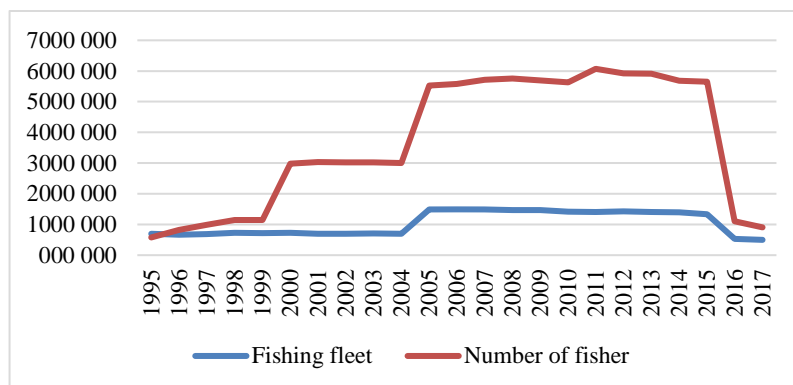


Figure 2. The number of vessels and number of fishermen (OECD, Fisheries database).

But overall, fisheries support is suggested as the most important factor in overfishing rather than employment and the number of vessels.

2.2. Evaluation of fisheries support

Support policies in fisheries are intended to develop the fisheries sector and to reach some government's goals like increasing production capacity, supporting fishermen and ensuring a stable supply of fish. The types of the fisheries subsidies vary from country to country. Some of the subsidies are related with the production level and can encourage production. These policies are production-distorting policies. Some of the subsidies are important for development of the fisheries sector, improvement of livelihood of the fishermen and supporting sustainability of ocean resources. These subsidies are non-production-distorting payments.

Basic fisheries subsidies that are related with the production level are:

Payments based on variable input use. These payments are made on the basis of the costs of the fishing operation, such as purchase of gear, bait or ice, or the use of port services.

Payments based on output. These transfers are made on the basis of the price of fish. They include tariffs, market interventions and consumer subsidies.

Payments based on fuel use. These payments are in the form of fuel tax concessions or fuel subsidies. According to the FSE calculation, the amount of fuel that fishermen obtain from their own coasts is taken into account. The fuel they obtained from foreign countries is excluded from this calculation. Some countries are selling fuel for the vessels below the global average price (Martini and Innes 2018: 18). This is harmful for over fishing and this policy is both production-distorting and trade-distorting.

Payments that are indirectly related with the production (fishing) are:

Payments based on fishers' income. These are transfers that include employment insurance, disaster payments, wage subsidies, special income tax concessions.

Payments based on fishers' own capital. These transfers are based on investment in fishing operations or working capital for operations. This category includes, for example, concessional loans, special tax treatment on investment or returns on investment other than for capital in fishing vessels. Support that increases operators' capacity to profit from the fishery, such as upskilling, marketing training and assistance would also fall in this category.

Payments based on vessels. These transfers are made on the basis of the purchase, alteration, or scrapping of a fishing vessel. To remove over fishing pressure on the stocks, fishing vessel buyback program was launched in some countries. Some vessels were bought and removed from the fleet. In Turkey, fishing vessel buyback program was launched in 2012 and it has been continuing.

According to the OECD statistics, China provides the highest fisheries support among the countries with \$ 3.83 billion in 2016 (Figure 3). In China, the support value was 6.97 billion dollars in 2012, it decreased to 5.06 billion dollars in 2014 and decreased again to 3.83 billion dollars in 2016.

China's fisheries support estimate alone is above the total Fisheries Support Estimate of all OECD countries of \$ 3.80 billion. The countries that supported the fisheries sector the most after China were Japan with \$ 1.22 billion, United States of America with \$ 803 million and Canada with \$ 675 million, respectively. Turkey has reduced the fisheries subsidies over the years; from 250 million dollars in 2013, to \$ 149 million in 2017.

OECD categorized the fisheries subsidies according to their effect on production capacity (OECD, 2018): *Variable inputs* (such as for equipment, fuel or bait) and *fixed inputs* (vessels and other durable investments) are the most likely to increase fishing capacity. *Transfers based on fishers' income* is relatively less likely to increase capacity. *Support to general services* (management, enforcement, infrastructure investments and R&D) is the least likely to increase capacity or fishing effort. China gives the highest input support to the fisheries sector among the countries (Figure 4). China is followed by Malaysia, Mexico, Indonesia, Brazil, Peru, France, Belgium and Chile.

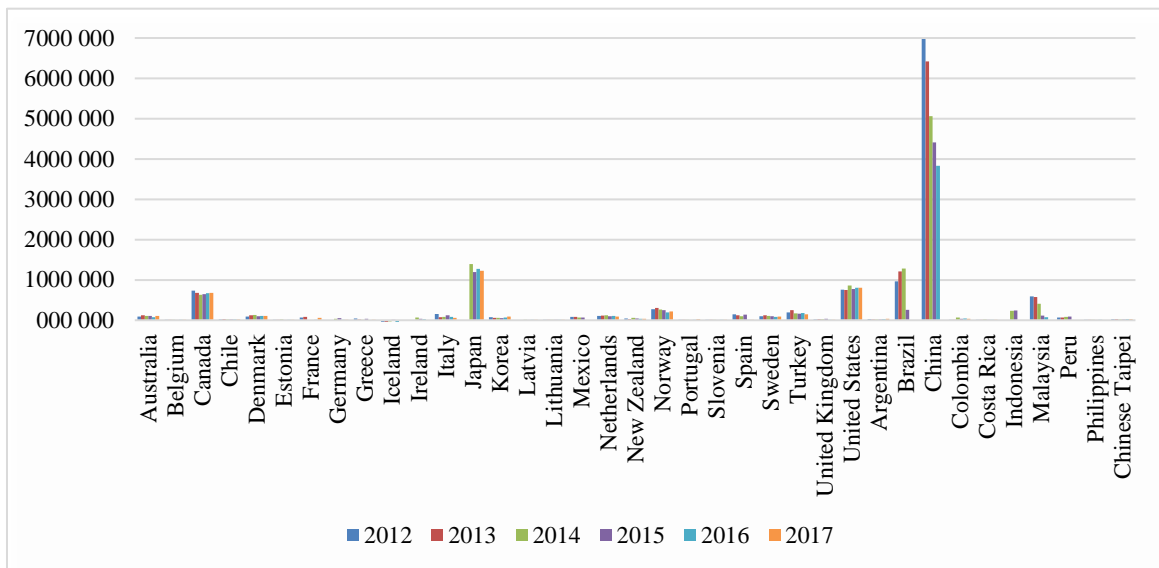


Figure 3. Fisheries support estimate of OECD- and non-OECD countries, million Dollars (OECD, fisheries support estimate database).

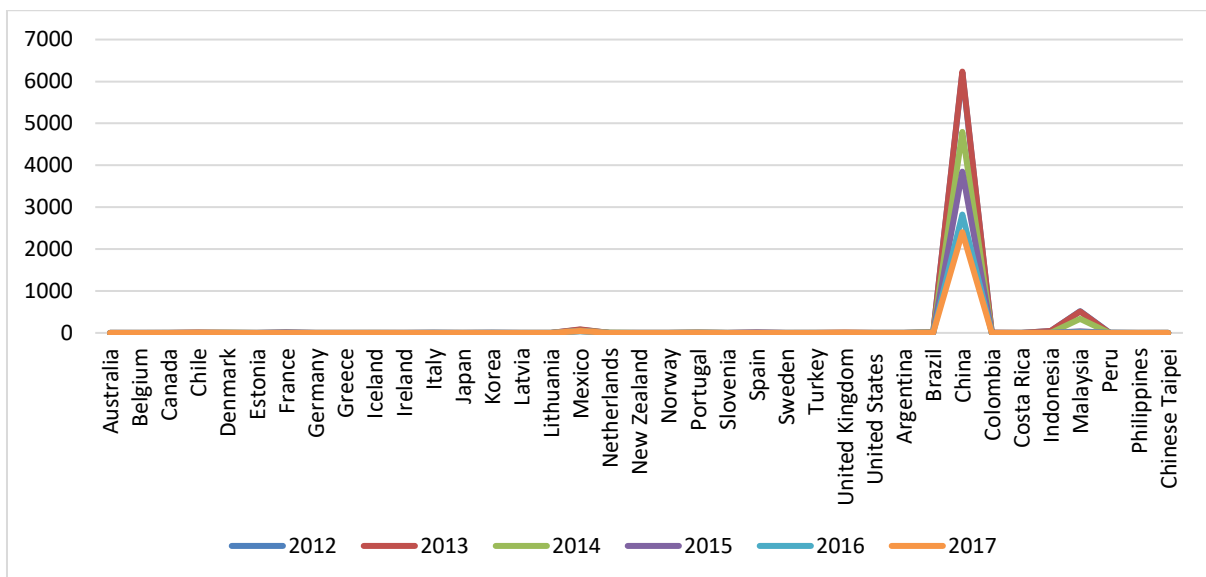


Figure 4. Input subsidies in fisheries, million Dollars (OECD, Fisheries support estimate database).

Sustainable Development Goal 14– which concerns the ocean –calls on World Trade Organization members, “to prohibit certain forms of fisheries subsidies which contribute to overcapacity

and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing and refrain from introducing new such subsidies” by 2020. Prohibition of some fisheries subsidies that lead to overcapacity and overfishing have been considered in the WTO Doha Round in 2001; and at the WTO 11th Ministerial Conference in Buenos Aires in 2017 (WTO). But no agreement was reached.

Kituyi M. and Thomson, P. (2018) stated in the World Economic Forum that “90%” of fish stocks are used up due to the fisheries subsidies; especially fuel subsidies (type of input subsidies) are the crucial part of the fisheries support estimate. According to Kituyi and Thompson, harmful fisheries subsidies encourage overfishing and they benefit generally large-scale fleets. Nearly 85% of the fisheries subsidies are received by large fleets. However, 90% of the fisheries sector consists of small-scale fleets.

Reducing overfishing would allow overexploited fish stocks to recover over time and sustainable fishing activities would bring higher economic returns in time (World Bank Group, 2017). However, to reach that equilibrium, reforms are necessary like shifting harmful subsidies to less production distorting subsidies. The subsidies can be applied to invest in sustainable fisheries, aquaculture and coastal community livelihoods, reducing the pressure on fish stocks (Kituyi and Thomson, 2018).

In the context of the fisheries subsidies, The Blue Growth Initiative of the Food and Agriculture Organization of the United Nations (FAO) assist countries in developing and implementing blue economy by eliminating harmful fishing practices and overfishing and instead incentivizing approaches that promote growth, improve conservation, build sustainable fisheries, and end illegal, unreported, and unregulated fishing (World Bank, 2017).

3. Results

For estimating the fish production level; support level, number of vessels and employment in the fishing sector are selected as explanatory variables. LogPL is the production level (in US Dollars) and denotes the dependent variable. LogSL is the total value of Fisheries Support Estimate in US Dollars which can encourage over fishing. LogV shows the fishing fleet (number of vessels) that can also increase catching operations. LogF indicates the number of fishermen (employment) in the fishing sector.

In order to examine whether the support level (SL) in the fisheries sector, the number of vessels (V) and the number of fishermen (F) affect the over fishing; production level model (PL) is estimated for the related countries between 2012 and 2017.

Ho: There is a positive correlation between production level and fisheries support level

H1: There is no relation between the variables

The following equation expresses the regression model:

$$\log PL_i = \alpha + \beta \log SL_i + \beta \log V_i + \beta \log F_i + \varepsilon_i \quad (1)$$

The coefficients of the parameters are statistically significant. The best fitted model is presented below:

$$\log PL_i = -4.0340 + 0.4350 \log SL_i + 0.4336 \log V_i + 0.4094 \log F_i \quad (2)$$

Support level and the number of vessels have a positive correlation with the production level.

Ho; Hypothesis of whether the support level affects the production level in the related countries is accepted.

(Ceteris paribus), a 1% rise in the fisheries support estimate causes an increase in the production level by 0.43%; a 1% rise in the number of vessels causes an increase in in the production level by 0.43%; a 1% rise in the number of fishermen causes an increase in in the production level by 0.41%.

PooledOLS Estimation Summary

Dep. Variable:	log_production level	R-squared:	0.6902
Estimator:	PooledOLS	R-squared (Between):	0.7390
No. Observations:	151	R-squared (Within):	-2.7787
Date:	Mon, Feb 10 2020	R-squared (Overall):	0.6902
Time:	10:08:45	Log-likelihood	-263.19
Cov. Estimator:	Unadjusted		
		F-statistic:	109.15
Entities:	31	P-value	0.0000
Avg Obs:	4.8710	Distribution:	F(3.147)
Min Obs:	1.0000		
Max Obs:	6.0000	F-statistic (robust):	109.15
		P-value	0.0000
Time periods:	6	Distribution:	F(3.147)
Avg Obs:	25.167		
Min Obs:	20.000		
Max Obs:	29.000		

Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
const	-4.0340	1.2727	-3.1697	0.0019	-6.5490	-1.5189
log_support value	0.4350	0.0829	5.2507	0.0000	0.2713	0.5988
log_nr of vessels	0.4336	0.1051	4.1267	0.0001	0.2259	0.6412
log_nr of fisher	0.4094	0.0995	4.1151	0.0001	0.2128	0.6061

To sum up, according to the estimations, it has been observed that the fish production level has been affected by the increased number of fishermen and vessels. Also, high fisheries subsidies in the countries have affected the production levels in the countries causing an increase in fish harvesting.

4. Discussion and Conclusion

Fish harvesting is one of the main sources of human livelihood in many countries. As stated before, there are three main sources of overfishing: increased number of fishermen, rise in fleets and high fisheries subsidies.

As the number of fishermen and vessels rise in the countries, fish harvesting increases too. If there is a risk of overfishing due to the fleet capacity, countries can apply vessels buyback programme in order to minimize fishing pressure.

Generally, governments pursue high subsidies in the fisheries sector in order to ensure a stability in the fish production and to support earnings of fishermen. However, production-related subsidies like input subsidies (fuel tax exemptions) cause an increase in production level. So, these subsidies lead to overfishing and so depletion of fish stocks in the world.

The results in this study suggest that an increase in the fisheries support leads to over fishing. Although in the model, the coefficient of the support value is not so high, anyway it has been observed that the fisheries subsidies affect the production level. Also, the increase in the number of vessels and in the number of fishermen causes an increase in the fishing effort, too.

These findings highlight the importance of the types of fisheries subsidies. Generally, the main critics about the subsidies are whether the support is related with the output and whether it is in the form of input subsidies like fuel subsidies. This kind of policies is production-distorting causing over production. Decreasing the level of support has been discussed in GATT/WTO Rounds and the main idea in the Rounds were shifting the output and input support to non-production-distorting policies which gives importance to environmental-friendly production, animal welfare, income insurance and safety net programmes.

Blue economy must be supported for sustainable ocean and sea resources. The subsidies which can lead to overfishing must be changed and the countries can shift these harmful policies to non-production distorting policies.

For further researches, it is recommended to examine other components of the blue economy.

References

- Atakpa, D. (2018). Blue Economy in a Nutshell. https://www.researchgate.net/publication/327550968_BLUE_ECONOMY_IN_A_NUTSHELL_Capt_NN_SD_Atakpa.
- Çoban, M. N. & Ölmez, Ü. (2017). *Mavi Ekonomi ve Mavi Büyüme*, *Turkish Studies*, 12/3.
- FAO. (2018). The State of World Fisheries and Aquaculture.
- FAO. (2017). Blue Growth Initiative. Rome.
- Kituyi M. & Thomson, P. (13.07.2018). 90% of fish stocks are used up – fisheries subsidies must stop emptying the ocean. *World Economic Forum*. <https://www.weforum.org/agenda/2018/07/fish-stocks-are-used-up-fisheries-subsidies-must-stop/>, 02.01.2020.
- Martini, R. & Innes, J. (2018). *Relative Effects of Fisheries Support Policies*, *OECD publishing*. <http://dx.doi.org/10.1787/bd9b0dc3-en>.
- OECD FSE. (2019). Fisheries Support Estimate Database. <http://www.oecd.org/agriculture/topics/fisheries-and-aquaculture/>, 7.01.2020.
- OECD. (2019). Fisheries Database. <http://www.oecd.org/agriculture/topics/fisheries-and-aquaculture/>, 07.01.2020.
- OECD. (2018). Review of Fisheries 2017: General Survey of Fisheries Subsidies. [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/FI\(2017\)14/FI_NAL&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=TAD/FI(2017)14/FI_NAL&docLanguage=En), 15.06.2020.
- Pauli, G. (2010). *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*. Paradigm Publications, United States.
- The Economist. (2015). Investing in the Blue Economy: Growth and Opportunity in a Sustainable Ocean Economy.
- United Nations. (2014). Blue Economy Concept Paper.
- World Bank. (2017). The Potential of the Blue Economy: Increasing Long-term Benefits of the Sustainable Use of Marine Resources for Small Island Developing States and Coastal Least Developed Countries.
- World Bank. (2017). The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries.
- World Bank. (2016). Oceans 2030: Financing the Blue Economy for Sustainable Development.
- WTO. Introduction to fisheries subsidies in the WTO. https://www.wto.org/english/tratop_e/rulesneg_e/fish_e/fish_intro_e.htm, 10.01.2020.