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THE FISHING SECTOR IN ROMANIA – EVOLUTIONS AND TRENDS FROM THE PERSPECTIVE OF FOOD SAFETY AND SECURITY

ABSTRACT

In the last 30 years, the transition from the central economy to the rigors, requirements and limitations of the market economy has generated, at national level significant structural and behavioral modifications, which were reflected upon the performance and competitiveness of the national economy, and also upon the capacity to ensure the food safety and security of the population.

As the majority of the activity sectors in the field of agrifood economy, but with more stressed paces, the fishing sector in Romania was confronted in the last 30 years with many problems, with a direct effect upon the capacity to ensure the food safety and security on this panel.

From this perspective, the present approach proposes itself to realize a diagnosis of the fishing sector in Romania, by the ratio to its capacity in order to ensure the supply of the population with specific basic and quality products, resulted from the rational management of internal resources.

Key words: fishing sector, food safety and security, consumption, trade balance, development potential.

JEL Classification : Q20, Q22, Q10, Q11.

1. INTRODUCTION

As a sub-branch of the food sector, the fishing sector contributes more and more to the world foods of aquatic origin, having in view that, in the case of the majority of fish stocks in the wild environment, the limits of the sustainable exploitation are at present reached or quite exceeded.

On the other side, this is an important economic activity in many coast and continental regions, offering high quality products, with the strictly respecting of the standards regarding the sustainability of the environment, animal health and consumer protection.

At the same time, the sector contributes to the reduction of the dependence on the fish imports and can speed up the rural and coast areas development, including the creation of new jobs both in the primary and processing industries, having a significant impact on the food security.

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2. STAGE OF KNOWLEDGE

Without proposing ourselves at the present moment to detail the evolution of the fishing sector along time, we must precise though, that the scientific interest for this was manifested together with the issuing in Japan of the first fishing treatise. At European level, the documentary sources confirm the fact that fishing farming origin dates since the Roman epoque, being regarded from the propagating Christianity perspective, with the goal of respecting the religious perceptions regarding the food habits.

In Romania, the first documents regarding fishing are dated since the year 1100, referring to the existence of many ponds. Also, there are many references to fishing and pisciculture in the official documents in the XVth–XIXth centuries on the present territory of Romania. Given being the importance of these activities, the researches made in the last 50 years led to a better understanding of the way of the aquatic eco-systems functioning, as well as to the increase of the awareness degree in the need to manage them in a sustainable mode.

Having in view that the world sector of fishing is a sector conditioned by the market and due to the rapid food industry development, the coast states were obliged to take account of the new possibilities to invest in this field in order to face the increasing demand in fish products.

The discussions taken place among the specialists revealed the necessity to elaborate a behavior code for a responsible fishing, which, without having an obligatory character, should define all the principles and norms applicable for the preservation, management and putting into value of all the fishing houses.

Adopted in 1995, the behavior code for a responsible fishing has permitted and established the principles for a better understanding of the functioning of the aquatic ecosystems and global awareness to manage these resources in a responsible manner (FAO, 1995).

Efforts made at world level were consolidated along time and made priority starting with the year 2015, by approaching in a coherent and coordinated way of the sustainable development goals for fishing and aqua-culture. The implementation of fishing based on science and aqua-culture management policies, correlated also with predictable and transparent regimes in the international trade represents basic minimum accepted criteria at international level for the development of this field in a sustainable manner.

At community level, the concerns for establishing a new common policy framework in the fishing and aquaculture domain have started together with the Rome Treaty, being elaborated a common policy in this domain. Although, even if, initially, this policy was strictly linked to the Common Agricultural policy, along time it has become more and more independent.

Since its revision in 2002 (The EU Rule no. 2371/2002), the common policy in the fishing field has as a main goal to ensure the sustainable

exploitation of the fishing resources and to guarantee stable incomes and jobs for the fishermen. The Lisbon Treaty has introduced a series of modifications to the fishing policy.

In 2013, the Council and Parliament reached to an agreement regarding a new Common Policy in the fishing domain (the EU Rule no. 1380/2013). Practically, the new common policy in the fishing domain is made to ensure that the activities of the fishing and aquaculture sectors are sustainable from the point of view of the environment on long term and are managed such that they be coherent with the goals to obtain economic social and labour force occupation benefits.

As part of the reform package, the common market organisation for products obtained from fishing and aquaculture will be ensured by utilisation of the financial instruments, the new adopted European fisheries and maritime affairs fund (FEPAM¹), EU no. 508/2014, being destined to this purpose.

At national level, the evaluation of the resources in the domain of pisciculture made the object of many studies in the academic field, but also at the level of the institutions with specific attributions. The importance of this sector in the national economy is given mainly by the role which this one has through the potential of food resources and the raw material for valorification, through the active role in the creation and maintaining of the environmental services, especially through the generation and maintaining of the humid zones and of the ichtyologic and avi-fauna biodiversity and through the vitality stimulation at the communities and local economies' level. Either that the goal of scientific approaches was that of making a diagnosis of the present resources and of the development potential of the domain, the information obtained were a starting point in the foundation of some specific policies and strategies, inclusively from the perspective of attracting community funds.

The specialty studies elaborated at the level of institutions (MARD, 2014), as well as the national strategy in the field (MARD and MECC, 2014) have evidenced the weak and strong points of the fishing sector at national level, being established specific objectives destined to the increase of this sector competitiveness, utilising internal financial resources, but also from structural funds.

Although Romania benefited from financial grants through the community financial instruments, the conditions for accessing, the weak organization at the level of the institutions responsible with the the funds' management, the non-respecting of the terms regarding the transmission of the statements of expenditures to the European Commission for re-imburement or the red tape among the clerks placed Romania on the last place at community level at the chapter of European funds absorbtion (Stanciu and collab., 2014).

¹ With a community budget estimated for the period 2021–2027 of 6.14billion.euro.

In the context of sustainable development we cannot omit from discussions the environmental component also, respectively both the impact of climate changes, leading to a lack of certitude as regards the communities' vulnerability, and that of fishing and aqua- culture upon the environment.

According to the specialists (UNSAID, 2015), although taken individually, the impact of small activities can seem minimum, at collectivity level, their scale and their amplitude can have large effects upon human health and upon the natural systems supporting life. Practically, the implementation of any project in the fishing and aqua-culture field should not omit the environmental component, respectively a management of climate risks (UNSAID, 2018).

According to specialists (Vermeulen, 2014), the climate changes are affecting the food security at global level, the most important effects being found at the level of the small producers. A global analysis of the incomes from fishing is suggesting that the developing countries, with a great dependence on fishing, will be the most affected in a negative way from the impact of climatic changes (Lam and collab., 2016).

For example, Blasiak and collab. (2017) have evaluated 147 countries in respect to the national economies' vulnerability impact upon fishing utilizing an index of the vulnerability and found that 87% of less developed countries are in the upper part of that index, attributing this thing to the smaller levels of the adapting capacity in these countries.

Practically, there are anticipated climatic changes in order to increase the fishing vulnerability in sweet water captured inside, due to the changes in the water quality determined by the decrease of the dissolved oxygen, the change of water chemistry and the potential of concentrations in heavy metals' increase (Chen and collab., 2016).

Concluding on the aspects referring to the studies and programatic documents elaborated at international and national level, we cannot but present shortly also their impact from the production point of view, that of the international trade and of the consumption of fish products. Thus, according to most recent information given by EUMOFA, in 2018, the world captures in total and the aquaculture production reached a maximum level in the last 10 years (EUMOFA, 2020). Thus, with an increase of 3% in the year 2018 opposed to 2017, the combined totals (fishing and aqua-culture) increased from 206 mill. tones to approx. 212 mill. tones. The fish catches increased by 3.2%, while the farm production increased in the same period by 2.7%.

The producers' ranking is dominated by China which owns 38% of the world total combined production (fishing and aqua culture), followed by Indonesia (10%), India (6%), Vietnam (4%), Peru (3%) and European Union (EU-28) with 3%.

As regards the consumption prices of the fish and aqua culture products, these inscribed themselves on an increasing trend in the period 2014 – 2019, being higher by 14% than eight years before.

In 2019, imports and exports of fish and aquaculture products between EU and rest of the world totalized 8.55 mill. tones, with a value of 33 billion. euro, placing the community space on the second place as size after China.

In 2018 (the most recent available statistical year), the supply with fish and aqua culture products for the human consumption reached to 14.72 mill. tones live weight. Although this was one of the largest amounts in the last ten years, it represented a light decrease of 99.884 tones or 0.7% opposed to 2017, due to the diminution of the production both from fishing, and aqua culture.

With all changes intervened in the production and trade structure, in 2018, the self-sufficiency ratio of the EU, which measures the capacity of the EU member states to meet the demand from its own production, has remained according to the average on ten years.

Nevertheless, a comparison of the data in 2018 with the data in 2017 shows a slight decrease caused by the combined effect of the increase of imports and decrease of the production. On the same slightly decreasing trend it was situated the consumption per capita of fish products, which was diminished in 2018 comparatively to 2017 by 2.2%, respectively from 24.36 kg (2017) to 23.82 kg/inhabitant (2018).

2. MATERIAL AND METHOD

By ratio to the goal followed, the present approach is based on the analysis of the informational support identified from public databases, both at national, and international level, as, without limiting ourselves only to these, Tempo-Online, Eurostat, EUMOFA, Faostat etc.

Also, the approach has in view the use of well known statistical methods, of type of: comparisons, weights, and structures, the analysis of primary indicators identified and of those derived being realized at national level, but also by comparison with the values registered at community and international level, where the informational support permits. In order to ensure the comparability of the value data, the approach has in view the utilization of the euro, the indicators analysed being shown both graphically and, by tables. The period held in view for the analysis is afferent to the interval 2007-up- to present, in function of data availability, this being adjusted afterwards in order to ensure some sseries of homogeneous data.

3. RESULTS AND DISCUSSIONS

Discussing about the capacity of the Romanian piscicultural sector to ensure the demand and food security at national level, a first step held in view is the level

of the production realized. From this point of view, according to the statistical data, Romania registered in the period 2008-2019 a visible tendency to increase the fish catchings, maintaining itself nevertheless to a much lower level to those obtained in the other Member States. Although the dynamics of the fish production from the catchings at national level point of view marked the greatest increase at community level, from 443.6 tones of fish live weight in 2008, Romania reached in 12 years' time to catchings of only 71494 tones, situating itself among the 19 Member States², on the 16-th place (Table 1).

Table 1

Evolution of fish catchings at community level in 2019 comparatively to 2008, tones

	2008	2019	2019/2008 (%)
Belgium	22,097.9	21,061.2	-4.7
Bulgaria	7,666.1	10,268.6	33.9
Germany	207,436.1	207.2	-0.1
Estonia	98,202.8	83,625.7	-14.8
Greece	83,821.1	82,232.5	-1.9
Spain	853,372.9	837,216.3	-1.9
France	489,716.4	525,121.7	7.2
Croatia	49,011	64,019.9	30.6
Italy	232,206.1	180,736.5	-22.2
Cyprus	1,991.6	1,480.1	-25.7
Lithuania	157,104.9	100,691.2	-35.9
Malta	1,282.1	2,229.7	73.9
The Netherlands	375,556	319,036.1	-15.0
Poland	115,527	181,087.9	56.7
Portugal	223,845.7	183,972.2	-17.8
Romania	443.6	7,149.4	1511.7
Slovenia	727.5	120.4	-83.5
Finland	119,355.5	139,263.1	16.7
Sweden	229,725.2	178,136.9	-22.5

Source: Own calculations on the basis of Eurostat data, 2021.

If at the level of fish catchings Romania managed to obtain in 2019 approx. 7.000 tones, as regards the aquaculture production, thi was situated in 2019 at around 4.000 tones, registering though a doubling of the quantity as opposed to the year 2008.

From this point of view, comparatively to 25 Member States, Romania is on 22 place, the first position being occupied by France (around 306000 tones), while at the opposed pole is Belgium (86 tones) (Table 2).

² For which statistical data are available.

Table 2

Evolution of aquaculture production at community level in 2019 comparatively to 2008, tones

	2008	2019	2019/2008
Belgium	126.0	86.0	-31.7
Bulgaria	7,251.0	11,959.4	64.9
Denmark	20,395.0	20,989.0	2.9
Germany	37,216.2	40,221.4	8.1
Estonia	43,977.0	37,998.4	-13.6
Ireland	474.7	1062.0	123.7
Greece	44,870.8	34,977.0	-22.0
Spain	114,888.0	128,747.9	12.1
France	252,237.7	306,507.4	21.5
Croatia	238,248.6	194,328.3	-18.4
Italy	16,386.5	20,443.9	24.8
Cyprus	157,865.1	154,407.0	-2.2
Latvia	3,776.2	8,079.1	114.0
Lithuania	583.3	626.4	7.4
Malta	3,008.0	3,775.2	25.5
The Netherlands	15,000.0	17,315.1	15.4
Poland	6,726.9	13,823.4	105.5
Portugal	46,621.4	45,750.0	-1.9
Romania	2,087.0	4,250.0	103.6
Slovenia	36,813.0	39,730.5	7.9
Finland	7,352.0	11,475.3	56.1
Slovenia	1,315.0	2138.2	62.6
Slovakia	1,078.0	2,688.7	149.4
Finland	13,438.9	15,295.8	13.8
Sweden	7,595.7	11,600.0	52.7

Source: Own calculations on the basis of Eurostat data, 2021.

According to statistical data, at national level, the annual average consumption of fish and fish products in fresh fish equivalent registered in the period 2007–2019 an increasing evolution, respectively from 3.9 kg/capita /year (2007) to 7.99 kg/capita/year (2019).

In opposing the national statistics, the information supplied by Eurostat are putting into evidence the apparent fish consumption which, in 2018, was situated at the level of 7.99 kg/capita/year, comparatively to the European average of 24.36 kg/capita/year, Romania occupying the 24 place from the 28 Member States existing in 2018 (Table 3).

Although at the community level the trend registered by the apparent fish consumption is increasing, it cannot be omitted from the view its reduction within seven community states with percentages between 0.2% (Austria) and -5% Great Britain.

Table 3

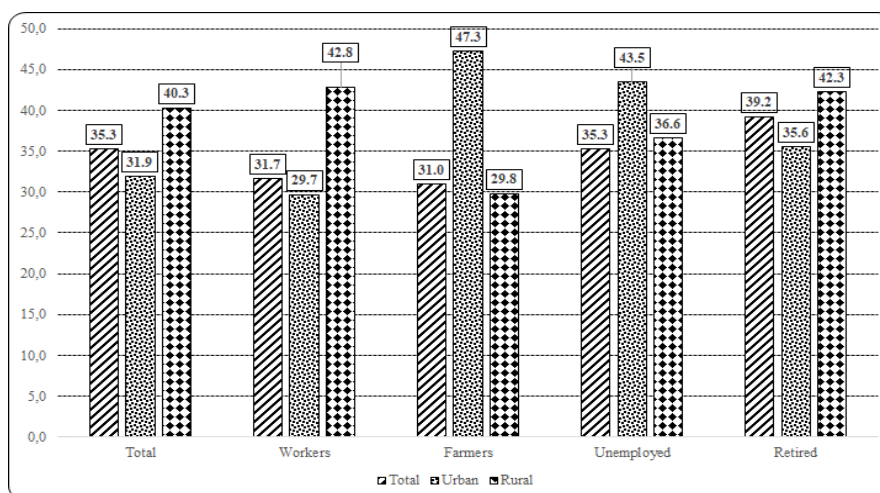
The apparent fish consumption in 2018, kg/inhab/year and the variation towards 2017, %

	2018	Variation towards 2017 (%)
EU-28	24.36	-2
Malta	85.95	41
Portugal	60.92	1
Spain	46.01	-1
Denmark	39.83	14
Luxembourg	33.76	-0.2
France	33.52	1
Italy	31.02	1
Sweden	26.61	-4
Finland	25.56	-2
Cyprus	23.86	1
Ireland	23.13	-3
Belgium	22.85	2
Great Britain	22.10	-5
The Netherlands	20.90	-
Greece	19.85	4
Croatia	19.19	6
Germany	14.50	3
Lithuania	13.78	6
Austria	13.20	-0.2
Poland	13.02	1
Slovenia	11.69	2
Estonia	9.71	72
Slovakia	9.27	1
Romania	7.99	4
Bulgaria	7	3
Latvia	6.80	-
Hungary	6.12	3
The Czech Republic	5.6	4

Source: EUMOFA, 2020.

Deepening the analysis at national level by social categories, it is to be revealed the fact that, in the rural, the monthly average consumption per person varies, for example, in 2019, between 0.485 kg/month (unemployed) and 0.781 kg/month (retired).

Although it is regarded in dynamics (Figure 1), the monthly average consumption of fish/inhabitant registrates a significant increase in the case of the four social categories (salary workers, farmers, unemployed and retired), a level of the fish and fish products monthly average consumption among the retired persons can be explained, on one hand, by the products' prices comparatively to those of other food products, and on the other hand, by the structure of the consumed products, by fish species.



Source: Calculations on basis of data in Tempo-Online, NIS, 2021.

Figure 1. The dynamics of the monthly average fish and fish products consumption in Romania by social categories in 2019 comparatively to 2007 (%)

As share in the family budgets, the expenses dedicated to fish and fish products buying have registered an increasing trend, mainly as result of selling price increase. Nevertheless, the expenses afferent to the fish products are having a reduced share in the total monthly expenses, by all social categories and both residence environments, with percentages between 24% (unemployed in the rural) and 4.38% (farmers in the rural areas) (Table 4).

Table 4

Evolution of the share of monthly expenses with the fish and fish products buying by social categories, in the period 2007–2019 (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total	3.06	3.06	3.37	3.51	3.53	3.59	3.66	3.73	3.93	3.91	3.93	3.96	3.90
Urban	2.90	2.95	3.22	3.32	3.32	3.39	3.44	3.49	3.78	3.83	3.86	3.92	3.87
Rural	3.41	3.28	3.68	3.90	3.94	3.98	4.10	4.21	4.22	4.04	4.05	4.04	3.94
Salary workers	2.90	2.91	3.19	3.40	3.29	3.40	3.51	3.53	3.74	3.80	3.85	3.94	3.85
Urban	2.87	2.92	3.18	3.30	3.21	3.34	3.47	3.43	3.71	3.81	3.90	3.97	3.88
Rural	3.03	2.87	3.24	3.86	3.64	3.63	3.66	3.90	3.87	3.76	3.70	3.87	3.76
Farmers	3.79	3.44	4.13	3.87	3.97	3.95	3.99	4.17	4.69	4.25	4.69	4.38	4.35
Urban	3.27	2.81	4.42	3.57	3.71	3.16	2.66	3.44	4.62	4.49	4.59	4.29	4.12
Rural	3.85	3.48	4.10	3.90	4.00	4.04	4.12	4.23	4.70	4.22	4.70	4.39	4.38
Unemployed	2.76	2.66	2.92	3.14	3.15	3.12	3.36	3.54	3.22	3.10	3.30	3.19	3.26
Urban	2.82	2.73	2.88	3.01	3.03	3.13	3.19	3.45	3.39	3.26	3.73	3.15	3.99
Rural	2.59	2.55	3.01	3.51	3.45	3.09	3.84	3.78	2.92	2.79	2.62	3.23	2.40
Retired	3.28	3.30	3.59	3.70	3.85	3.90	3.89	4.01	4.15	4.09	4.05	4.04	4.03
Urban	2.99	3.09	3.33	3.43	3.60	3.60	3.49	3.62	3.87	3.89	3.86	3.89	3.91
Rural	3.73	3.64	3.98	4.11	4.25	4.34	4.50	4.61	4.55	4.37	4.37	4.26	4.20

Source: Calculations on basis of data in Tempo-Online, NIS, 2020.

Comparatively to the other Member States, the total expenses to buy fish and aquaculture products in 2019, were in Romania of 1023 mill. euro, increasing as opposed to 2018 by not only less than 8 percentages. In the conditions in which the apparent consumption of fish did not increase in 2019 opposed to 2018 only by 4%, the increase of expenses can be explained through the significant increase of their products prices (Table 5).

Table 5

The nominal expenses of the households to buy fish and aquaculture products in 2019 and the variation towards 2018 (mill. euro)

	Expenses	Variation towards 2018 (%)
Italy	11,686	1
Spain	10,055	2
France	8,724	2
Germany	5,562	3
Great Britain	4,429	3
Portugal	3,810	3
Belgium	1,661	3
Sweden	1,354	1
The Netherlands	1,319	4
Greece	1,313	1
Poland	1,054	5
Romania	1023	8
Austria	714	3
Finland	660	2
Denmark	655	3
The Czech Republic	402	6
Lithuania	386	5
Ireland	308	5
Croatia	276	5
Slovakia	270	8
Bulgaria	189	9
Hungary	150	7
Estonia	144	5
Luxembourg	140	5
Latvia	133	6
Slovenia	84	4
Cyprus	84	4
Malta	54	6

Source: Calculations on basis of EUMOFA data, 2020.

Practically, out of the 28 Members States, in 2019, Romania, together with Austria, has registered an increase of the annual expenses for the fish and aquaculture products of 8 percentages being exceeded only by Bulgaria (9%), as at the opposite pole be situated Italy and Sweden, with an increase of prices of only one percent.

Even if the national statistics does not offer sufficiently detailed information regarding the piscicultural sector performances, from the production, trade balance and also the non-food utilization of the derived products perspective, the information found in the FAO database permit the determination of only the consumption available, respectively of the total fish supply. From this perspective, in the period 2007–2017, we can see an increase of the total supply, except the aquatic animals, demersal fish and the marine ones (Table 6).

Table 6

Evolution of the consumption available by fish species in the period 2007–2017 in Romania (kg live weight)*

	Aquatic animals	Cephalopods	Crustaceous	Demersal fish	Sweet water fish	Sea fish	Shellfish exclusive cephalopods	Pelagic fish
2007	234	419	1,069	23,546	19,930	12,047	1,409	62,407
2008	264	498	1,515	21,946	35,683	12,863	1,188	70,058
2009	186	364	1,278	14,348	52,600	12,664	1,065	61,305
2010	168	395	1,465	14,110	51,622	11,084	1,582	58,359
2011	104	335	1,556	10,651	36,892	11,275	2,136	42,586
2012	95	810	1,921	12,244	35,073	8,529	3,327	52,339
2013	75	893	2,003	12,358	37,605	6,712	3,678	53,993
2014	78	1,046	1,627	13,781	40,783	6,140	4,585	64,277
2015	227	1,063	2,284	12,580	37,087	7,496	6,571	74,063
2016	129	1,404	2,856	14,311	41,450	5,959	7,838	73,710
2017	86	1,832	3,708	17,681	43,331	6,061	9,751	77,619
2017/2007 (%)	-63	337	247	-25	117	-50	592	24

* *Aquatic animals: frogs, turtles, sea cucumbers, hedgehogs etc. Cephalopods: inclusively squids, cuttle fish, octopus etc. Crustaceous: inclusively crabs, lobsters, shrimps, krill, etc. Demersal fish: including flat fish, koi, hake, haddock, sharks etc. Sweet water fish: fish carp, mullet, tilapia, sturgeon, eel, salmon, trout, etc. Pelagic fish: inclusively anchovy, herring, sardines, tuna, mackerel etc. Shellfish excl. cephalopods: inclusively abalone, oysters, mussel, seashells, etc. Sea fish: inclusively unidentified sea fish.*

Source: Calculations on basis of FAOSTAT data, 2021.

The increase of the supply at fish is on account of imports increase mainly and not on the own production, the fish and fish products' consumption being thus influenced directly by the acquisition prices, by the variation in foreign currency, but also by the level of population incomes.

The increase of the internal fish production with a net superior rate than that in other member states does not counterbalance the imports, which makes that, at internal level, the self supply degree be estimated as reduced.

The fish consumption encouragement, and this sector development, in order to ensure the internal necessary of the population, can be realized by the implementation of specific measures, linked on the one hand to the improvement of

the living standard, and on the other to the quick utilization of the internal financial allocations, and also of the community ones.

In this respect, at least in ratio to the last previously mentioned aspect, should not be omitted the financial support from FEPAM, which has in view, among others:

- The remake of fish stocks,
- The progressive elimination of captures thrown back to the sea,
- Data collection regarding fishing and the reducing of man's influence upon the sea environment,
- Measures of control to ensure the respect to the norms,
- International cooperation and integration in maritime domains as space planning and surveillance.

Anyhow, although that of the EU member states, Romania owns the biggest bio-geographical diversity (5 bio-geographical regions from the 11 European ones) and it could benefit, at least in the last European financial exercise 2014–2020, of 2.93% from the FEPAM budget, the reduced absorption capacity for these funds did not determine a visible improvement of the sectoral performances, Romania being still far from the community environments.

5. CONCLUSIONS

The fishing sector in Romania registered a visible involution after 1989, generated by the permanent structural changes at all levels, inclusively from the perspective of the reduction of internal resources and the vanishing of the Romanian fleet.

The need for permanent adjustment to the international rigours in the domain, correlated with the weak administrative capacity to attract and implement structural funds, led to the ensuring the internal necessary of fish mainly from import, at prices always increasing.

Practically, with a reduced level of the internal production and on the background of a negative trade balance, affected by the variations in the foreign currency, the annual average fish and fish products consumption in Romania is smaller by 67 percentages towards the community. It is also true that the population purchase power in Romania differs significantly towards that in the other member states.

To this is added, inevitably, the consumption options at individual level, settled more or less on objective criteria. The evolution at the fish and fish products prices comparatively to those of the prices at other basic food products, but also correlated to the high level of expenses for other utilities/products/sevices, can incline the balance in favor of purchasing other food products, or to the reducing of the quantities bought for consumption.

As long as the general trend is to increase imports, with a rate net superior to the internal production, at higher prices, and the existence of a processing industry weakly developed, the increase of fish and fish products consumption at national level and the ensuring of the food safety and security of the population tends to become a more and more difficult objective to attain in the lack of some rapid measures for intervention from behalf of the decidents, in concordance to the goals followed at international level in this field.

BIBLIOGRAPHY

1. Blasiak, R., Spijkers J., Tokunaga K., Pittman J., Yagi N., Osterblom H., (2017), *Climate Change and Marine Fisheries: Least Developed Countries Top Global Index of Vulnerability*, PLoS ONE 12(6): e0179632. <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0179632>.
2. Chen, Y., Todd A.S., Murphy M.H., Lomnický G., (2016), *Anticipated Water Quality Changes in Response to Climate Change and Potential Consequences for Inland Fisheries*, Fisheries 41(7): 413–416. doi: 10.1080/03632415.2016.1182509.
3. Lam, V.W.Y., Cheung W.W.L., Reygondeau G., Sumaila U.R., (2016), *PROJECTED change in global fisheries revenues under climate change*, Scientific Reports 6: 32607. doi:10.1038/srep32607.
4. Stanciu, S., Mihalcea, L., Radu, I., (2014), *Sectorul piscicol românesc în context comunitar*, http://www.prutinvest.ugal.ro/images/Sectorul_piscicol_rom%C3%A2nesc_%C3%AEn_context_comunitar.pdf.
5. Vermeulen S. J., (2014), *Climate change, food security and small-scale producers: Analysis of findings of the Fifth Assessment Report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). CCAFS Info Note*, Copenhagen, Denmark: CGIAR Research Program on Climate Change, Agriculture and Food Security (CAAFS). <https://cgspace.cgiar.org/handle/10568/35215>.
6. * * * (1995), *Codul de conduită pentru un pescuit responsabil*, FAO, Roma.
7. * * * Regulamentul (CE) nr. 2371/2002 al Consiliului din 20 decembrie 2002 privind conservarea și exploatarea durabilă a resurselor piscicole în conformitate cu politica comună în domeniul pescuitului.
8. * * * Regulamentul (UE) nr. 1380/2013 al Parlamentului European și al Consiliului din 11 decembrie 2013 privind politica comună în domeniul pescuitului, de modificare a Regulamentelor (CE) nr. 1954/2003 și (CE) nr. 1224/2009 ale Consiliului și de abrogare a Regulamentelor (CE) nr. 2371/2002 și (CE) nr. 639/2004 ale Consiliului și a Deciziei 2004/585/CE a Consiliului.
9. * * * Regulamentul (UE) nr. 508/2014 al Parlamentului European și al Consiliului din 15 mai 2014 privind Fondul european pentru pescuit și afaceri maritime și de abrogare a Regulamentelor (CE) nr. 2328/2003, (CE) nr. 861/2006, (CE) nr. 1198/2006 și (CE) nr. 791/2007 ale Consiliului și a Regulamentului (UE) nr. 1255/2011 al Parlamentului European și al Consiliului.
10. * * * (2014), *Studiu de piață pentru sectorul pescăresc din România, proiect realizat în cadrul asistenței tehnice pentru dezvoltarea și consolidarea capacității instituționale a DGP-AMPOP în vederea elaborării și pregătirii implementării POPAM 2014–2020*, Ministerul Agriculturii și Dezvoltării Rurale, București.
11. * * * (2014), *Strategia Națională a Sectorului Pescăresc, 2014–2020*, Ministerul Agriculturii și Dezvoltării Rurale, Ministerul Mediului și Schimbărilor Climatice București.

12. * * * (2015), *Sector Environmental Guidelines. Fisheries and Aquaculture*, UNSAID.
13. * * * (2018), *Sector Environmental Guidelines Wild-Caught Fisheries and Aquaculture*, UNSAID, https://www.usaid.gov/sites/default/files/documents/1860/SectorEnvironmentalGuidelines_FishAqua_2018.pdf.
14. * * * (2020), *The EU Fish Market. Highlights the EU in the World Market Supply Consumption Import – Export Landings In the EU Aquaculture*, European Commission – EUMOFA Luxembourg: Publications Office of the European Union.
15. * * * (2021), Baza de date Tempo-Online, INSSE, București.
16. * * * (2021), Baza de date Eurostat, Comisia Europeană.