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***Investing in sustainable fisheries***

MULTIANNUAL NATIONAL STRATEGIC PLAN FOR AQUACULTURE IN BULGARIA

(2014-2020)

**Sofia, September 2013**

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**List of abbreviations**:

|  |  |
| --- | --- |
| BAS | Bulgarian Academy of Science |
| BA | Biodiversity Act |
| BFSA | Bulgarian Food Safety Agency |
| CFP | Common Fisheries Policy |
| CITES | Convention on International Trade in Endangered Species of Wild Fauna and Flora, |
| CLLD | Community-led Local Development |
| COM | Common organisation of the market |
| CSN | Common strategic framework |
| EDFRA | European Development Fund for Rural Areas |
| EFF | European Fisheries Fund |
| EIA | Environmental impact assessment |
| EMFS | European Maritime and Fisheries Fund |
| EPA | Environmental Protection Act |
| EU ETA | EU Emissions Trading System |
| FAA | Fisheries and Aquacultures Act |
| FAO | UN Food and Agriculture Organisation |
| LIFG | Local Initiative Fisheries Group |
| GNP | Gross National Product  |
| GGE | Greenhouse gas emission |
| GIS | Geographic Information System |
| FMP | Good Management Practices |
| IMP | Integrated Maritime Policy |
| IOBC | International Organization of Biodiversity Conservation |
| MRD | Ministry of Regional Development |
| MAF | Ministry of Agriculture and Food |
| MEW | Ministry of Environment and Water |
| NAFA | National Agency for Fisheries and Aquaculture |
| NCCD | National Construction Control Directorate |
| HGO | Non-Governmental Organizations |
| NBC | National Biodiversity Council |
| NCSP | National Concept for Spatial Planning |
| NSI | National Statistical Institute |
| OP | Operational Programme |
| OPFSD | Operational Programme for Fisheries Sector Development |
| PO | Producer Organization |
| RD | Research and Development |
| RFSD | Regional Food Safety Directorate |
| ROFM | Regional Organizations of Fisheries Management |
| SFA | Sustainable Fisheries Agreements |
| SME | Small and medium-sized enterprises |
| PA | Protected areas  |
| SWOT | SWOT – Strengths, Weaknesses, Opportunities and Threats |
| WA | Water Act |
| WFD | Water Framework Directive |

**Introduction**

The Multiannual national strategic plan for aquaculture have been prepared in conformity with the provisions of Article 43 of draft proposal for a Regulation of the Common Fisheries Policy and draft proposal for a Regulation of the European Parliament and of the Council concerning the European Maritime and Fisheries Fund.

European aquaculture sector offers high-quality products under strict standards of environmental sustainability, animal health, and consumer protection. Aquaculture is a sub-sector of the **"Fisheries" Sector. The "Fisheries" Sector includes all activities in fishery, production, processing and marketing of fishing and aquaculture products. Sub-sector "Aquaculture" covers the cultivation of aquatic organisms – fish, molluscs, crabs and plants by interfering with the process of rearing and reproduction of aquatic organisms in order to increase the resulting production, and the management and ownership of the resource may be individual and/or collective.**

**This plan covers all activities related to the production of fish and other aquatic organisms and is expanded by measures to diversify the activities of producers and the opportunities for marketing of the production.**

Aquaculture is one of the pillars of the EU strategy for "blue growth" as the sector development helps for executing the indicators set out in the strategy at the European Commission "Europe 2020" level on job creation, introduction of innovations, increasing the energy efficiency of enterprises, lifelong learning, reduction of poverty and social exclusion.

Proposed reform of the Common Fisheries Policy (CFP) aims to encourage the aquaculture sector through a process of consultation with all stakeholders: administration, industry, retailers, consumer associations, and representatives of civil society. It is provided that this support will be implemented by the elaboration of strategic guidances of the EC and multiannual national strategic plans of the member countries, that outline a frame made in conformity with the principles of partnership, where shall specify common objectives and metrics to measure the progress in achieving these objectives.

# National Context and Relationship with Key National Targets

## General Description and Development of the "Aquaculture" Sector in Bulgaria

### Current Trends in Aquaculture Production in Bulgaria

According to official statistics of the National Agency for Fisheries and Aquaculture, the total production from Bulgarian aquaculture industry (fish and other aquatic organisms) for 2012 amounted to 7557.14 tons.

Analyses of the production volumes in the sector by 2007 indicate a clear upward trend in production and that it will reach the average levels of 7500 tons per year. The abovementioned data indicates, that this positive trend in the growth of aquaculture production changes, but in 2011 and 2012 the total production registered significant decline. The drop volume is 2300 tons, compared with production in 2010. As a reason for these observed processes, might be pointed the global economic recession in the country and Europe, as well as the resulting drop in the market demand and difficulties in small and medium size enterprises, which apply to the segmentation of the most of Bulgarian aquaculture producers.

**Table 1** Output of three major groups of aquaculture, depending on the preference to salinity and water temperature

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Type aquaculture | **2003** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **2011** | **2012** |
| Cold-watered | 1028.70 | 1578.59 | 1562.21 | 1914.54 | 2176.04 | 2461.36 | 2916.06 | 3418.26 | 2526.00 | 2899.03 |
| Warm-watered | 1854.54 | 1614.52 | 2438.34 | 2767.41 | 3604.78 | 4105.05 | 4839.23 | 5491.94 | 4473.36 | 3770.35 |
| Sea mussels | 15.00 | 117.74 | 170.59 | 227.71 | 298.92 | 596.02 | 816.71 | 920.01 | 750.98 | 887.76 |
| **TOTAL** | **2 898.24** | **3 310.85** | **4171.14** | **4 909.65** | **6 079.74** | **7 162.43** | **8 572.01** | **9 830.22** | **7 750.34** | **7557.14** |

**Figure 1** Annual aquaculture production (in tons) in Bulgaria for the period 2003 – 2012

**Figure 2** Annual production of the main organism groups of aquaculture in Bulgaria for the period 2007 – 2012.

\**Crustacea*: 2007 – 1,5 tons; 2008 – 2,9 tons; 2010 – 10,3 tons; 2011 – 8,3 tons

Aquaculture production in Bulgaria is dominated by fish production, followed by the production of molluscs - Black Mussel. The amount of produced mollusks, *Mytilus galloprovincialis* after 2009 tends to increase and the production is within about 850 tons. From the crustaceans - only freshwater crayfish aquaculture have developed, and the main object of cultivation is crayfish (*Astacus leptodactylus*), whose production in 2012 amounted 3.4 tons, which is 0.05% of the total aquaculture production in the country for the same year. In recent years, was also registered the production of the protected by the Bulgarian legislation crayfish species – *Astacus astacus*, (less than 1 ton).

Mainly representatives of two fish families are forming the aquaculture production in Bulgaria for the period 2007-2013. Since beginning of aquaculture activities in Bulgaria, more than a century ago till now, the most significant production remains that of carps, followed by trout. The species structure of Bulgarian aquaculture industry is determined by both climatic and hydrological conditions in the country and the traditional preference of the population for these species. Over the past 5 -10 years is observed a trend of change in the species structure of the cultivated hydrobionts resulting in variety diversification.

The reason for these changes might be resulting from one side in the amended legislation of the Republic of Bulgaria, directed to protection of some species (sturgeon species) by restricting fishery of natural populations, and from other side introduction of modern technologies and equipment, allowing cultivation of non-domestic species (exotic ones), despite of the local natural climatic conditions. As an example of aquaculture production originated and evolved because of the prohibition of the exploitation of natural resources in the country is sturgeon production. Production of catfish species also tends to increase, probably due to the introduction of new species, such as African catfish and Channel catfish *(Ictalurus punctatus)*. Introduction of closed recirculation systems allowed the cultivation of some exotic species in our country such as barramundi (*Lates calcarifer*). Still there is a tendency that the proportion of native species, such as perch species pikeperch (*Sander lucioperca)*, perch (*Perca fluviatilis****)***) and northern pike (*Esox lucius*), to be at significant, compared to the total production (Figure 4 and 5). The greater variety of aquatic organisms on the market (including imports) also stimulates the demand modifications.

The future diversification in the production of aquatic organisms in Bulgaria should be orientated to the introduction of valuable species of the local fauna, which for one reason or another have not been subject to cultivation in the country. But there are existing cultivation technologies applied successfully not only in Europe. Successful could be also the implementation of innovative new technologies and approaches for their cultivation.

 The species that have proven their perspective cultivation are pikeperch, perch,tench, huchen (*Hucho hucho*), grey mullets, turbot etc.

**Figure 3** Proportion of the representatives of particular fish species in the production of Aquaculture Sector for the period 2007-2012.

**\****Perch species*: 2007 – 7,8 tons; 2008 – 16,9 tons; 2009 – 27,4 tons; 2010 – 21,3 tons; 2011 – 20,9 tons; 2012 – 27,0 tons;

*\*\* Others:* between 20 and 35 tons annually;

**Figure 4** Proportion of native and non-native (introduced, alien species) hydrobionts in the production of Aquaculture Sector in Bulgaria, 2007-2012.

The tendency that the production of aquaculture in the country to be based mainly on the production of non-native[[1]](#footnote-1) (introduced, alien) species is a durable trend and marks its beginning from the origin of organized fish farming in Bulgaria. The first foreign specie introduced sustainably in the local aquaculture is the Rainbow trout (*Oncorhynchus mykiss*), that is remaining the leader in the production of trout fishes in Bulgaria. Since the end of 70s, an increasing share possess acclimated carp species from the Far-East-Complex (silver carp and bighead carp, black carp and grass carp). It should be noted that, in contrast to other countries, in Bulgaria all mentioned species are only successfully acclimated without occurred naturalization which means that they could not reproduce in wild and could not form their own populations. In the period 2007-2012 were introduced two new species for the purposes of aquaculture cultivation – the African catfish (Clarias gariepinus) and barramundi (Lates calcarifer). Barramundi are cultivated in close recirculation system in the city of Bourgass, and there is no danger of introduction into the environment, and its further invasion in natural aquatic eco-system. African Catfish is subject to net-cage farming in ponds used for cooling of the water of thermal power plants, and it is also considered that there is no danger of natural reproduction of individuals in natural waters. Recently African Catfish is grown in recirculation systems. Production of these newly introduced species is small in volume and species are not well known at the local market.

Among carp fishes dominate the production of common carp (*Cyprinus carpio*), followed by volume of production by silver carp, bighead carp and grass carp, as these species are an important element in polyculture and also find application in the biological control of the water quality. In recent years is growing the interest in using black carp as a tool for biological control on the highly invasive species of mussels – Zebra mussel (Dreissena polymorpha).

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**Figure 5** Proportion of particular species of Carps Family in the production of Aquaculture Sector for the period 2007-2012, Bulgaria.

\**Black carp*: 2009 – 1 ton; 2011 – 0,1 tons; 2012 – 4 tons

Traditionally, coldwater aquaculture in Bulgaria is dominated by the production of rainbow trout, while the amounts produced from the native trout species brown trout (*Salmo trutta*) are minor and mainly intended for restocking of natural water basins in order to maintain and restore natural fish populations. The production of other introduced North - American specie in our country – brook trout (*Salvelinus fontinalis*) has long standing traditions, but it also has a minor share of the total production of Salmonidae. The same applies to certain salmon species (e.g *Salmo salar sebago*), whose introduction in Bulgaria is still experimental (Figure 7).

**Figure 6** Proportion of particular species of Trout Family in the production of Aquaculture Sector for the period 2007-2012, Bulgaria.

\**Brook trout and Lake salmon (aggregated data):* 2007 – 5,4 tons; 2008 – 3,4 tons; 2009 – 3,7 tons; 2010 – 10,9 tons; 2011 – 10,1 tons; 2012 – 11,8 tons.

Production of native species European Catfish (*Siluris glanis*) for the period 2007-2012 remained relatively stable around 100 tons per year. In the period 2007-2011, increased the production of the American introduction-channel catfish (*Ictalurus punctatus*), and its production is mainly concentrated in a few centres with suitable climatic conditions for the species.

The production of newly introduced African catfish (*Claries gariepinus*) is still unstable and sporadic.

**Figure 7** Proportion of particular species of Catfish Family in the production of Aquaculture Sector in Bulgaria for the period 2007-2012.

\* *African sharptooth catfish:* 2011 – 1,8 tons; 2007, 2008, 2009 and 2012 – 0 tons.

The sturgeon production in the country started only from the beginning of this century. As an incentive for the development of this part of our aquaculture industry play two factors. On the one hand these are the restrictive and prohibitive measures on the use of natural resources of those species, whose populations worldwide are greatly diminished, and some are threatened by extinction, and on the other hand – the persistently high prices and the constant demand for black caviar in the international markets. The sturgeon farming in the country begins with the construction of a small farm in Bolyartsi Village (Plovdiv Region) mainly for the production of sterlet (*Acipenser ruthenus*), Russian sturgeon (*Acipenser gueldenstaedtii*) and beluga (*Huso huso*). In 2012 sturgeon production declared 15 registered farms growing almost the entire range of species native living in the Bulgarian waters of the Danube and the Black Sea (sterlet (*Acipenser ruthenus*), Russian sturgeon (*Acipenser gueldenstaedtii*), stellate sturgeon, (*Acipenser stellatus)*, and beluga (*Huso huso*) and some introduced species. The production of the hybrid (Bester) is in small quantities and it is not reported separately. Over the past two years stellate sturgeon and sterlet appear in the statistics, which is a tendency of species diversification in the sturgeon farming. Two sturgeon species were introduced - Siberian sturgeon (*Acipenser baerii*) and paddlefish (*Polyodon spathula*). Paddlefish *Polyodon spathula* is zooplanktivorous with meat of high quality. This species is a valuable alternative to the bighead carp, especially in the context of policulture. However, no farms in the country involved in systematic artificial propagation of paddlefish and industry relies on imports from neighbouring countries.

**Figure 8** Distribution of aquaculture production by species from family Acipenseridae for the period 2007-2012 in Bulgaria (tonnes live weight)

\* *American paddlefish:* 2011 – 0,4 tons; 2012 – 0,5 tons*; European sturgeon*: 2009 – 1 ton; *Sterlet*: 2010 – 1 ton; 2011 – 0,4 tons; 2012 – 0,6 tons

**Figure 9** Dynamics of production volumes and registration of the farms for Mediterranean mussel (*Mytilus galloprovincialis*), 2007 - 2012, Bulgaria

The only species reared in our marine aquaculture is black mussel (*Mytilus galloprovincialis*). The number of currently existing farms for black mussel is 43 with total production of about 878 tons in 2012. Other non-native species of molluscs, introduced accidently in the past into the Black Sea are also of market interest such as a sand gaper (*Mya arenaria*) and sea snail (*Rapana ven*osa), which are currently subject to commercial fishery, without developing methods for breeding and rearing them.

### Key Production Systems in “Aquaculture” Sector Used in Bulgaria

#### Production Systems in Freshwater Aquacultures

At present, in Bulgarian aquaculture, the following main production farming systems are applied: free-extensive and semi-intensive fish farming in natural or artificial water bodies with still or running waters; intensive fish farming in specially constructed concrete or earthen basins; fish farming in net cages and recirculation systems.

**Figure 10** Distribution of fish-farms in Bulgaria, according to the system applied to farming in 2012

* **Cultivation of fish in dam lakes**. Stocking of dams with fish and other aquatic organisms and their catch upon reaching the market size is widely spread practice in Bulgaria. This type of cultivation is applied both in small ponds (up to several ha) and in middle-sized ones (over 20 ha). This type of production requires little capital investment, especially in fingerling material and fishery equipment (boats, seines, etc.). Often the only fish-breading activities in that case is restocking of the pond, and catching fish, when it reaches the market size. The production is based mainly on natural fish productivity, which for reservoirs in Bulgaria ranges from 20 to 70 kg ha-1. ranges from 20 to 70 kg ha-1. **In rare cases, for the fish** feedingare used fodder, drugs, fertilizers, lime processing etc are added. The extensive and semi-intensive production methods are environmentally friendly, although often based on the introduction of non-native species (bighead carp, grass carp, paddlefish) in the water basins, which in many cases represent a potential threat to native species due to competition for food or space. Negative consequence with significant importance that has occurred as a result of uncontrolled stocking of the water basins in Bulgaria is the spread of potentially invasive species such as *Lepomis gibbosus*, *Pseudorasbora parva*, and some pathogens and parasites that cause disease. In recent years, of particular concern is the invasion of the zebra mussel *Dreissena polymorpha*. Mussel *Dreissena* has entered for the first time in the basin of the Maritsa River Basin (Dam Ovcharitsa and Zhrebchevo), North-western Bulgaria (Dam Ogosta, Dam Rabisha, Ogosta River, Vit River), and probably many other places (Dam Sopot). The risk for the country is very large, especially if affect*ed drinking wate*r *reservoirs or strat*egic sites for industrial and irrigation water (e.g. Dam Mandra, Dam Iskar, Dam Yovkovtsi, Dam Rozov Kladenets, the dams along Dolna Arda River, etc.*). Th*e economi*c damages* may turn out beyond the Bulgarian abilities if they affect a large number of strategic sites in the near future. It is believed that the new invasion of mussels is *related to the r*a*pid development* of extensive fish-farming in Bulgaria inthe last decade, and fishermen practicing recreational fishing may also have possible contribution to it.

Limitingfactor for the importan*ce* of extensive fish-farming is that most of the water basins in Bulgaria are completely unsuited for this type of fishfarming. Despite that we have over 3000 in number, the dams in the country were not built for fish *farming as main function. They wer*e built mostly for agricultural purposesand as reservoirs for irrigation. Many dams posess sloping bottom that is not clean of wood debrris, rocks, etc. when flooded, which makes the catch of farmed fish laborious and inefficient. Aquaculture activities are aditionally awkarded also, due to the complex use of the water bodies as for example (power generation, irrigation, drinking water, recreational tourism activity), that often conflicts with aquaculture activities. During the summer season, the water inflow of these reservoirs is reduced and often even stops, which is also a limiting factor, especially in terms of stocking density. In case where dams are located near urban areas, manufacturing plants, agricultural areas, livestock farms, etc., a negative cumulative effect is often observed such as water pollution. The consequences from the impact of these factors result in highly degraded parameters of the water quality.

Recommendation: As a promising activity, complementing the extensive fish-farming is the development of fishery tourism.

* **Cultivation of fish in specialized basins/ponds**. The **basins** are specially built facilities purposed for reproduction, growing and storage of various hydrobionts. Their structure complies with the requirements of the species and the technological processes in the production activity. According to the type of farmed fish in the basin farms dominate those for producing carp fish (warm-water farms). Then follow basin farms for salmonids (coldwater farms). The climatic, hydrophysical and hydrochemical conditions in part of these facilities allow co-existing of representatives of carp, catfish and sturgeon specis.

**Figure 11** Distribution of Basin farms and Dams for extensive or semi-intensive fish farming according to the species composition of farmed fish.

In Bulgaria there are two classic types of basin farms – pools with earthen walls used primarily for carp-farming and rarely for trout-farming, and concrete pools, (mainly "channel" type) primarily used in trout farms. Much of farms with earth basins were constructed more than 40 years ago. The average size of the fattening (feed-up) basins range from a few acres to several tens of acres, and basins with area of over 50 acres are rare. Fish farming in the basin farms is predominantly intensive, and intensification is achieved by feeding with specialized fodder, which in recent years is applied not only for trout farms, but also for carp farms. Among the basin farms prevail non-hatchery, fattening type ones, for the production of fish for consumption.

Key problems of this type of farms are: 1) poor water quality 2) reduced water levels due to drought climate, 3) high cost of the consumed water, 4) high cost of feed, 5) high cost of electricity; 6) outdated technical base and infrastructure, 7) deterioration of the basin and problems with the guard security of production, especially in large farms.

* **Fish breeding in net cages**. In our country this breeding system is applied in the inland freshwaters, mainly in large and medium sized dams. In recent years, net cages are arranged in smaller water basins (less than 5 acres) with appropriate depth. Net cages relate to the equipment for super-intensive production.

The number of newly established net cage fish farms has steadily increased in the period 2007 to 2012, reaching a total of 46 active farms in 2012.

**Figure 12** Dynamics of establishing cage fish farms in Bulgaria, 2007-2012

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Despite the existence of many specialized cage farms for growing only one fish species, there are number of combined in terms of species composition cage farms Combinations most often include carp, catfish, sturgeon, which have approximately similar range in terms of their requirements for environmental parameters. In recent years net cage fish farms are built of circular modules of high density polyethylene (HDPE), with a diameter of exceeding 10 – 12 m. In a number of reservoirs, the old metal components have also been replaced by the above-described. The main production problems of cage farms are associated with (1) deterioration of water quality, (2) fluctuation of the water level in reservoirs used for irrigation and electricity, (3) lack of breeding material (mainly in trout species, which problem is solved trough import), (4) difficulties in the prevention and treatment of diseases, and others.

It is going to be developed a system for determining the maximum possible volume of aquaculture production for each water body, based on the characteristics of each water basin, the type of farmed fish, the method and the type of feed. Implementation of such of production limits is intended to reduce the risk of excessive eutrophication and its extremely negative consequences for the environment and humans. In this regard, it is forthcoming the development of an ordinance under Article 25, paragraph 5 of the Fisheries and Aquacultures Act. Currently the net cage fish farms rely on the annual production volumes from the permit for use of the water body issued by the Basin Directorates (MEW) under the Water Act.

**Figure 13** Existing as of 2012 net cage fish farms classified according to their specialization in growing fish species (family).

* **Closed recirculation systems**.

A great advantage of this type of system is relatively small quantities of water needed for production and purification due to the constant and repeated use. Controlled conditions in recirculation systems make them independent of climatic, geographical and other environmental factors. They are to high degree environmentally friendly, and this is a major advantage, especially in countries such as Bulgaria - poor in water resources, and at the same time with a high percentage of protected areas included in the network of Natura 2000. Production in these systems is energy intensive, since water recirculation systems use electricity, which makes it particularly appropriate to combine the farms of this type with renewable energy sources.

The main problem in the operation of this type of production systems is the lack of qualified personnel with expertise focused on this type of technology. Solution to the problem is organizing of trainings for the students, provided from the manufacturers of this type of structures and investment in training centers in the country. Also an existance of possible jeopardy might appear for the newly constructed recirculation farms, expressed in shortage of fingerlings, especially for recirculation systems that are oriented towards non domestic or non traditional type of fish - barramundi, perch turbot, pikeperch, etc.

### Distribution of the production in Aquaculture Sector according the regions in the country

The distribution of different types of production structures of the Aquaculture Sector in Bulgaria is uneven and this unevenness is mainly determined by the following factors - 1) availability of sufficient in quantity and quality water resources; 2) experience in production of fish and other aquatic organisms; and 3) general economic level of development of the area in concern. The influence of the individual factors on the various types of industrial circuits is in different degree. In areas with significant number of large dams, the number of net cage fish farms is respectively high. A weak diversification of production systems in areas is observed. In the most common case, one type of production system is dominant, and it is probably justified by the traditions of the region, its geographical and climatic conditions. The abovementioned factors, however does not apply to recirculation farms, which are relatively water independent.

**Table 2 – Territorial distribution on farms (in regions)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Region | Total number of farms | Cold- water farms | Warm- water farms | Mixed farms | Salt- water farms | Sturgeon farms |
| Blagoevgrad | 29 | 16 | 11 | 2 | 0 | 0 |
| Burgas | 27 | 1 | 5 | 1 | 20 | 0 |
| Varna | 21 | 0 | 10 | 1 | 10 | 0 |
| Veliko Tarnovo | 35 | 2 | 33 | 0 | 0 | 0 |
| Vidin | 10 | 1 | 7 | 1 | 0 | 1 |
| Vratsa | 9 | 2 | 6 | 0 | 0 | 1 |
| Gabrovo | 4 | 1 | 2 | 1 |  |  |
| Dobrich | 30 | 12 | 2 | 4 | 12 | 0 |
| Kartdzhali | 14 | 0 | 0 | 10 | 0 | 4 |
| Kyustendil | 1 | 1 |  |  |  |  |
| Lovech | 28 | 8 | 19 | 1 | 0 | 0 |
| Montana | 8 | 2 | 6 | 0 | 0 | 0 |
| Pazardzhik | 10 | 5 | 2 | 3 | 0 | 0 |
| Pernik | 1 |  |  | 1 |  |  |
| Pleven | 1 |  | 1 |  |  |  |
| Plovdiv | 76 | 3 | 65 | 6 | 0 | 2 |
| Razgrad | 13 | 0 | 13 | 0 | 0 | 0 |
| Ruse | 18 | 0 | 15 | 3 | 0 | 0 |
| Silistra | 1 |  | 1 |  |  |  |
| Sliven | 6 | 2 | 2 | 1 | 1 |  |
| Smolyan | 23 | 20 | 0 | 2 | 1 | 0 |
| Sofia | 19 | 9 | 6 | 4 | 0 | 0 |
| Stara Zagora | 17 | 3 | 8 | 5 | 0 | 1 |
| Targovishte | 11 | 0 | 11 | 0 | 0 | 0 |
| Haskovo | 16 | 0 | 15 | 1 | 0 | 0 |
| Shumen | 15 | 0 | 15 | 0 | 0 | 0 |
| Yambol | 8 | 0 | 8 | 0 | 0 | 0 |
|   | 451 | 88 | 263 | 47 | 44 | 9 |

**Table 3 – Territorial distribution of the farms in producing systems and annual production for 2012**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Region | Basin farms | Dams | Collectors | Pond farms | Production for 2012 |
| Blagoevgrad | 26 | 3 | 0 | 0 | 191838,4 |
| Burgas | 6 | 1 | 20 | 0 | 105746,3 |
| Varna | 5 | 5 | 10 | 1 | 95235,27 |
| Veliko Tarnovo | 24 | 11 | 0 | 0 | 221729 |
| Vidin | 5 | 4 | 0 | 1 | 87982,5 |
| Vratsa | 6 | 3 | 0 | 0 | 66616,67 |
| Gabrovo | 4 |  |  |  | 18936 |
| Dobrich | 14 | 1 | 12 | 3 | 814855 |
| Kartdzhali | 1 | 0 | 0 | 13 | 384507,6 |
| Kyustendil | 1 |  |  |  | 0 |
| Lovech | 26 | 1 | 0 | 1 | 120123,4 |
| Montana | 4 | 4 | 0 | 0 | 339465 |
| Pazardzhik | 7 | 0 | 0 | 3 | 42149 |
| Pernik | 1 |  |  |  | 0 |
| Pleven | 1 |  |  |  | 0 |
| Plovdiv | 50 | 23 | 0 | 3 | 850032,3 |
| Razgrad | 13 |  |  |  | 91650 |
| Ruse | 16 | 2 | 0 | 0 | 170469,9 |
| Silistra |  |  |  | 1 | 0 |
| Sliven | 4 |  |  | 2 | 7777,13 |
| Smolyan | 19 | 0 | 1 | 3 | 2017554 |
| Sofia | 15 | 0 | 0 | 4 | 79128,79 |
| Stara Zagora | 8 | 1 | 0 | 8 | 1569728 |
| Targovishte | 8 | 3 | 0 | 0 | 46004,25 |
| Haskovo | 6 | 8 | 0 | 2 | 55600,12 |
| Shumen | 7 | 8 | 0 | 0 | 124946,9 |
| Yambol | 6 | 1 | 0 | 1 | 53053,2 |
| 451 | 283 | 79 | 43 | 46 | 7557140 |

The structure of production in freshwater farms registered in NAFA may be conditionally categorized by production indices. For analytical purposes, the farms may conditionally be divided into "micro" – production of 10 tons per year, "small" - respectively from 11 to 49 tons, “medium” – from 50 to 99 tons, and “large” –production of more 100 tons per year (these categories are accepted only for the purposes of this analysis).

According to the statements submitted by operators for production quantities in 2012, as “Micro” production farms having output to 10 tons per year, can be identified 139 farms with a total annual production in 2012 of 504 tons. The number of farms with up to 1 ton production per year is 31. The production potential of this segment is within 2976 tons annual production. Despite the high number of operators, this segment produces only 6.7% of total production, and the reasons for this are complex and listed in details in the weaknesses of Annex No. 1 in this plan.

Current status of these operators shows that such production is not profitable enough. Opportunities for this production segment are directed to restructuring the production characteristics of farms, diversification of cultivated species and activities that add value to the fish-production under the local development strategies of local action fisheries groups, as well as participation in aqua environmental schemes.

The structure of the production segment is the following: 90 warm-water fish farms with an annual output of 367 tons; 34 freshwater fish farms with production 78.5 tons per year; 3 mussel farms with production 20.6 tons, and 12 farms of mixed type with a total of 37.8 tons production.

The full-system farms are 24, and according the methods for producing the largest share have the basin farms with production 377 tons (103 farms), followed by the dams with production 101 tons (24 farms), the collector systems for black mussel with production 20.6 tons (3 farms) and net cage farms with production 4.8 tons (3 farms).

Obviously, the effects of the economic crisis has affected this segment of farms due the reported decline by 16.8% of the annual production for 2012 compared to 2011, and by more than 43.5% compared to 2010.

In the segment of "small" industries – with over 11 tons to 49 tons, according to the submitted production quantities, may include 59 farms with 1267 tons total annual production in 2012. The share of this segment in the total annual production is 16.8%. Dominant are the warm-water farms – 35 farms with 744 tons of production, 9 farms are freshwater farms with 196 tons, 11 farms are mixed type farms with 223 tons production, and respectively 5 are farms for black mussels with a production of 104 tons. The production capacity of these companies is significant, amounting to 3558 tons. The full-system farms are 10, and the production capacity of all companies in the segment amount to 4324 tons. The leading production method for this segment is cultivation in basin farms – with production of 525 tons, in net cage farms – 244 tons, in dam farms – 394 tons, and in collector farms with production amounting to 104 tons. The output growth compared to 2011 is within 18.2%, and the suspended registrations in 2013 were 5.

Despite the small number – only 14, the share of "medium" farms according to their production volume for 2012 was 923 tons, or 12.1% of the total for the country. Production of species in warm-water farms amounted to 549 tons from 9 farms, of coldwater species – 138 tons in 2 farms, and 3 farms had mixed production both warm-water and cold-water species amounting to 236 tons. The marine aquaculture is not represented in this segment. Farms that are growing fish and in parallel produce fingerlings are 4 farms. This type of “medium” industries has production potential within 1570 tons. The leading methods for production are: cultivation in basin farms – with annual production of 516 tons, in net cage farms – 228 tons, and in dams – 172 tons. In this segment the production for the last year 2012 marks nearly 50% increase compared to 2011, and the production potential of these projects amounted to 1570 tons. There are no suspended registrations of farms in 2013 in this segment. The segment has export potential for fresh-water aquaculture, and in case of an appropriate diversification of cultivated species, can be generated export also by warm-water cultivated species.

The backbone of the production in the sector is set up by 13 major farms, which account alone over half – 64.46% of the total annual production in 2012 or 4871 tons. Increase in the production for this segment is observed for 2012 compared to 2011 in the amount of 37%. Production of warm-water species is around 1157 tons from 3 farms, and that of cold-water species is over 2088 tons from 5 farms. The production of 3 farms both warm-water and coldwater species amounted to 874 tons, and the production of 2 mussel farms was estimated to 753 tons, but one of them has suspended its farm registration in 2013. The full-system farms are 3. According to the methods of manufacturing predominates the cultivation in net cages in 5 farms, totalling 2115 tons or 43.4% of the total production. Production from basin farms in this segment amounted to 35% of the volume for 2012 or 1810 tons. Only one of the farms is located in an artificial water site with an annual output of 194 tons. Cultivation of mussels is done by collector systems. The structural aid for these farms should be part of the program's priorities because they support multiple operations related to processing, production of fingerlings, feed supplies, etc. The businesses are underlying the structure of the sector and their development directly shall affect the viability of the industry. Registered production potential of these farm amounts to 7011 tons, which is an excellent prerequisite for future optimization of production and companies’ development.

Beyond this structural segmentation, 226 farms have not submitted information on annual production in 2012 and could not be allocated according their production lines.

The reason for the high number of farms with zero output, may be seek for in the possibility that the entity can apply for registration in NAFA books at stage of investment intention, i.e. before it started building the farm. Another reason for the zero data is that some of these farms were registered as sites for commercial fishery and subsequently were re-registered as aquaculture farms under the provisions of the FAA. Small proportion of farms that have not provided any information about their activities over the last three years of production, currently are developing projects funded by the European Fisheries Fund, which will result in their active involvement in the production capacity of the country in the production period 2014-2015.

Newly registered farms in 2012, which could not provide information on annual production due to the technological cycle of cultivation and production, are 24 in number (the same number is valid for 2011), and 1 farm stated production capacity of 0 kg, which is most likely due to a technical error. Data not shown have large influence for the industry as numerically presented the production from these farms amounted to 2518 tons in 2010 and 1900 tons in 2011 respectively.

The majority part – 134 of these farms are warm-watered, 38 are for cold-water aquaculture, 33 are for production of marine aquaculture, and the 19 farms are mixed type.

The lack of production data for 2012 from these farms according the expert evaluation may be referred to as:

* suspension of activity by the operators due to the economic crisis;
* temporary suspension of the activity due to a period of farm restructuring;
* entry of new firms in the industry (annual registration of 24 for 2012 and 2011) by submission of project proposals for funding under the European Fisheries Fund.

The deleted companies from the Register since 2010 are 127. Their deletion by year of deletion is as follows: 2010 – 13; 2011 – 30; 2012 – 30; 2013 – 54;

Of these 85 are warm-watered farms; 8 – mixed type; 6 – for marine aquaculture; and 28 – cold-watered.

According to their method of production the deleted farms from the register are as follow:

88 for basin farms or 65% of the total;

24 farms located in dams or 19% in the total;

6 farms for marine aquaculture;

And 9 net cage fish farms

The reasons for terminating the registration may be looked for in the lack of working capital and equity financing to continue/start-up the business; decline in the purchasing power of domestic consumers, the lack of a structured market for selling and distribution of products, that would give certainty to operators; as well as problems with the ownership of water bodies that are rented for short periods and do not allow for large-scale capital investment; low profitableness at high risk of production.

In summary, from the data of this analysis can make the following conclusions to support policy development in the sector for the period 2014 – 2020.

* 13 large industries are producing about 65% of the total production of the country in 2012;
* If to the abovementioned structural farms, we add the farms with medium production in volume, their combined share will be 77% of total production of the country in 2012;
* The claimed production capacity of operators in the sector amounted to 39644 tons, of which the annual production for 2012 was barely 19%;
* No saltwater fish is cultivated in Bulgaria;
* The claimed production capacity of marine aquaculture amounted to 21 104 tons;
* 88% of the deleted farm registration are basin farms and farms cultivating fish in dams;
* 67% of the deleted farm registration are farms cultivating warm water aquaculture;
* The largest share of production amounts to the basin farms (intensive and semi-intensive technologies) – 43% of total production, followed by super-intensive pond fish farms– 34.3%.
* The current state of the operators indicate that all manufacturing segments have increased production, with the exception of "micro" production – up to10 tons;
* The ratio of warm-water to cold water aquaculture is predominated of warm-water species.

Information according to NAFA on the ownership of water basins used for aquaculture production in Bulgaria:

* State property – 92 farms;
* Municipal property – 143 farms;
* Private property – 146 farms;

**Figure 14**

**Figure 15**

### Fish Consumption

According data from an NSI national representative survey in 2012 carried out under a project[[2]](#footnote-2), implemented with the financial support of the Operational programme for the development of the Fisheries sector, financed by the EU European Fisheries Fund, the average annual consumption of fish and other aquatic organisms[[3]](#footnote-3), per household in 2012 was 11.8 kg, and the average per person was 5.1 kg. Carp is the most commonly consumed species in households throughout the country. Its share in the total consumption of the economically valuable fish species here studied was 33.0%. It is followed by rainbow trout – 13.0%; pikeperch – 11.5% and silver Prussian carp – 11.1%, etc. These species amount to 68.6% of the total fish consumption.

The total quantity of consumed fish and fish products in 2012 (economically valuable species for Bulgaria and other types of imports) at home and in the catering facilities is as follows: average per household 23.9 kg; per capita – 10.2 kg. The produced fish and fish products in the country form about 45% of the total consumption.

Several factors influenced the relatively low level of fish consumption: economic crisis in the transition to a market economy; lack of tradition in fish consumption; seasonality of production and fishing due to the specific climatic conditions in the country; lack of well-organized market infrastructure for fish and fish products, ineffective advertising; and high product prices. Data of the annual global consumption show 18.6 kg per capita, and for Europe – 21.4 kg per capita with the greatest consumption in Portugal – 56.9 kg per capita.

In recent years BGN 7 million were invested under the Operational program for development of the Fisheries sector of the Republic of Bulgaria, financed by the EU European Fisheries Fund to promote the production of aquaculture. Expected results will be more visible in the next programming period (2014 – 2020). Evaluation of the interviews and conversations with manufacturers in the industry suggest that the new species produced in Bulgaria, such as barramundi and African catfish, remain still unknown on the local market.

**Table 4** Consumption of fish and fish products per capita

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Product | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
| Fish and Fish Products  | 4.3 kg | 4.6 kg | 4.8kg | 5.3kg | 5.4kg | 5.1 kg |

*\*Source: NSI*

Additional findings from a national representative survey are as follows:

* More than half of the fish consumed by households in the country are from the economically valuable species;
* Households main supply of fish and other aquatic organisms comes from shops and markets – 86.2%;
* Positive opinion prevails among population that the market offers quality fish species like carp, rainbow trout and pikeperch.

The following facts should also be noted:

* EU policy in recent years aims to reduce fishing afford by vessels engaged in commercial fishing in marine waters;
* Natural populations have been proven to be diminishing.
* Nevertheless, demand for fish and fish products on global and European level is increasing, particularly in countries with high consumption of fish and fish products. The major share in demand is for marine aquatic organisms. A "substitute" satisfying this demand appears to be aquaculture and in particular marine aquaculture.

Therefore, operators of farms for production of carp and other freshwater species without good export potential should review their long-term activities and should focus on production of new types of aquaculture with better marketing opportunities.

### Employment in Aquaculture Sector

The gross value added (GVA) of the Aquaculture Sector in 2012 is about BGN 5 million, according to the National Programme for the collection, management and use of data in the Aquaculture Sector. The number of employees (FTE time) in the sector is 469 people, and the gross value of employee is BGN 10 594.

**Table 5**  Employment by years as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **2006** | Total | Full time | Part time |
| **Activity** | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Aquaculture production | 414 | 303 | 111 | 392 | 289 | 103 | 22 | 14 | 8 |
| **2007** | Total | Full time | Part time |
| **Activity** | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Aquaculture production | 385 | 297 | 88 | 361 | 276 | 85 | 24 | 21 | 3 |
| **2008** | Total | Full time | Part time |
| **Activity** | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Aquaculture production | 380 | 271 | 109 | 361 | 255 | 106 | 19 | 16 | 3 |
| **2009** | Total | Full time | Part time |
| **Activity** | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Aquaculture production | 378 | 284 | 94 | 344 | 257 | 87 | 34 | 27 | 7 |
| **2010** | Total | Full time | Part time |
| **Activity** | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Aquaculture production | 457 | 332 | 125 | 404 | 295 | 109 | 53 | 37 | 16 |
| **2011** | Total | Full time | Part time |
| **Activity** | Total | Men | Women | Total | Men | Women | Total | Men | Women |
| Aquaculture production | 502 | 379 | 123 | 436 | 329 | 107 | 66 | 50 | 16 |

*Source: NSI*

The main challenges the sector is facing are: poor working conditions, lack of motivation among young people to practice this profession and acquire specific skills, the gaps in the system of social security. There is a lack of developed infrastructure and facilities are outdated and inadequate.

### Import and Export of Fish and Fish Products

According to NSI data the total import of fish and fish products in Bulgaria in 2011 registered a slight decrease compared with the previous year by 2.4 % to 28 025.5 tons. The value of the export amounted to USD 68 729.3 thousand, which is 14.3% more than the previous year due to higher import prices (up with 17.2%). Traditionally, frozen fish holds the highest share in the total import of fish and fish products. About 67 % of the frozen fish imported in 2011 is mackerel – 11,523 tons – with 12.2 % less than the previous year, which could be explained by higher import prices. No mackerel catch is done in Bulgaria, therefore annualy it is imported to meet the market demand both for direct consumption and for canning. The largest quantities of frozen mackerel in 2011 were delivered from Spain (2 669.1 tons ), the Netherlands (2 459.1 tons ), Canada (2 197.4 tons ) and Romania (883.1 tons ).

According to the National Statistical Institute the generated total export of fish, aquatic organisms and fish products amounted to 8 201.8 tons in 2011, marking a slight increase of 0.6 % over the previous year, despite the reported decrease in catch and production of fish and other aquatic organisms in the country. Due to slightly higher average export price (3%), the total value of exported fish products increased by 3.6% compared to 2010, amounting to USD 29 090 thousand. In 2011 exports to the EU increased by 4.5% compared to 2010 to 6 445.3 tons and already formed 78.6% of total export of fish, aquatic organisms and fish products (compared with 75.6% in 2010). The most significant quantities are allocated to Romania, Sweden, Greece, France, United Kingdom, Poland, Italy and Spain. Exports of fish and fish products to third countries amounted to 1 756.5 tons – 11.7 % less compared to 2010. Main destinations were the Republic of Korea, Macedonia, Japan, Serbia, the Russian Federation, Albania and Croatia. The structure of exports in 2011 included: 7 124.5 tons of fish, crustaceans and molluscs – live, fresh, chilled, frozen, smoked or salted, and 1 077.1 tons of processed fish products (prepared or preserved fish, including caviar, canned crustaceans and molluscs).

Analysis of the above information shows that Bulgaria has a **negative trade balance** in fishery products. The reason is mainly in the lack of ocean fishing fleet to supply the processing industry and stores network with pelagic species (mainly mackerel), as well as the lack of Bulgarian saltwater aquaculture (except for the production of black mussel - (turbot, sea bass, sea bream, oysters, etc.).

A negative trade balance is observed with the traditional aquaculture species in cold-water aquaculture, whereas with carp species there is an excess. For example, in salmonid species there are 590 tons in 2011, and in carp (according data from Associations and exporting companies) the surplus is compensated by export prices close to or slightly above prime costs and mainly for the Romanian market. The reason for this export is justified by the saturation of the domestic market with carp species and the inability to realize additional quantities of this kind in the country.

**Figure 16** Import of fish and fishery products from the EU countries and third countries for the period 2007-2012



*Source: NSI*

**Figure 17** Export of fish and fishery products to the EU countries and third countries for the period 2007-2012



*Source: NSI*

Data on import and export of major agricultural species show there is:

* Positive balance (export exceed import) for carp by 315,166 kg;
* Negative balance (import exceed export) for trout – minus 590,200 kg;
* Negative balance (import exceed export) for shellfish – minus 52,217 kg.

The main conclusion is that the balance of import and export has no significant impact on the production and consumption of economically valuable species that are subject to aquaculture production.

### Processing Industry

Processing is the method of transforming fish and other hydrobionts supplied by catch or aquaculture production into value-added products for the food and processing industry.

Processing is divided into two main groups:

* **Treated fish products:** separated, dissected, sliced, filleted, minced, skinned, ground, cut, cleaned, trimmed, peeled, removed from scales, chilled, frozen or deep-frozen products.
* **Processed fish products:** products that have undergone a significant change from the original, including heating, smoking, canning, maturing, drying, extraction, extrusion or a combination of these processes.

At present according to the Bulgarian Food Safety Agency (BFSA) registers, there are 56 approved enterprises for trading with food of animal origin with the member countries, covered by Annex III of Regulation 853/2004/EES, and 6 of them have a temporary suspended activity. The approved establishments for trading with food of animal origin which are not subject to Annex III of the Regulation are 6, and one of them has a temporary suspended activity. The companies produce a wide range of products – fresh fillets, marinated and salted fish products, cold and hot smoked fish products, canned fish, caviar, etc., and many of them are packaging and re-packaging imported fish products. The range of the used raw materials are fish and other aquatic organisms both from import – mackerel, salmon, calamari, shrimp, etc., and from the Bulgarian aquaculture and fishing – rainbow trout, sturgeon species (mainly for the production of caviar), sprat, sea snails, black mussels, etc.

**Table 6** Main economic indices in the group "Processing and preserving of fish and other aquatic animals, without “ready meals"

|  |  |  |  |
| --- | --- | --- | --- |
| **Name**  | **Eurostat Code** | **2009** | **2010** |
|
| Number of entities – number  | 11110 | 33 | 34 |
| Turnover –BGN thousand | 12110 | 58 466 | 60 087 |
| Employed persons – number | 16110 | 1 475 | 1 470 |
| Value added at factor cost – BGN thousand | 12150 | 13 508 | 13 261 |

*Source: NSI*

### Marketing and infrastructure

The marketing infrastructure in the country is not well developed yet. Bulgaria is among the few member state countries where there is still no unified national fish auction, although the funds to do so are provided under the current Operational Programme (2007 – 2013) and the administration has set plans to structure this market. Regional and local fish markets and wholesale fish bases planned under the current OPDFS are also not developed. There is an urgent need to create a modern organization of the fishery products auction, which will undoubtedly have a positive impact on the management, control and accountability of production especially with respect to the completeness of statistics. Other existing need is to organize and create wholesale stations and distribution network for fish and fish products, including special auctions and stations for buying-up fish. In some of the mountain and rural regions their distribution is practically absent and therefore fish consumption in these areas is substantially lower, than the average.

A part of the producers of fish and other aquatic organisms have their own processing facilities located near production sites, which helps improving the quality of the final product and allows for adding value.

The marketing of major cultivated species takes place mostly in supermarket chains, specialized fish shops and public caterers. Due to the lack of the aforementioned market structures, sales prices still remain relatively low.

**Table 7** Average wholesale prices of major fish species for 2011:

|  |  |
| --- | --- |
| Carp– BGN 4,09  | Trout – BGN 6,87  |
| Silver carp – BGN 2,32  | Catfish – BGN 6,11  |

\*Prices are without VAT, SourceSAPI

Significant increase in prices compared to 2010 occurred in trout and catfish, while in carp species the values do not change or mark small backslide.

Currently market positioning of the production by Bulgarian farms **is not** on a competitive level with the producers from EU-27 and the Balkans. According to a study on the production and marketing of fishery and aquaculture appointed by the European Commission in 2009, DGMARE ( prepared by Ernst & Young) , the European market for fish products is the largest in the world and the annual demand is estimated at 12 million tons worth EUR 55 billion. These indices exceed the data from the Japanese and the American markets, which is an excellent prerequisite for the development of Bulgarian producers. The specifics of the European market lie in the fact that the structure of demand for these products is not homogeneous. Only Spain, France and Italy hold 62% of consumer costs for spending on fisheries and aquaculture. If Germany, Great Britain and Portugal are added, the values exceed 85% therefore only six member states form the significant part of the product consumption of in this sector.

According to data published from DGMARE study – facts and figures of the CFP 2012 by regional significance show the highest consumption levels are observed in southern European countries and the Baltic States. Annual consumption in the countries of north-eastern Europe is around 20 kg per capita, which is almost as much as the average annual European level of consumption of 23.3 kg per capita. For the countries of Central Europe consumption ranges from 15 to 22 kg per capita, whereas the smallest portion of consumption falls to the former Soviet bloc countries from Eastern and Central Europe, such as Bulgaria, Romania, Czech Republic, Slovakia, Poland, Hungary, etc. It is estimated to be between 5 to 10 kg per capita annually. This data should be a focal point for operators in the industry when planning their production and output on the domestic market and within the Balkans region.

Development trends of the European market until 2030 are determined by several factors:

* **The quantitative increase in consumption** in the European market is rising as a whole. Peak consumption of fishery and aquaculture is reached in Mediterranean countries and could hardly be exceeded by a large increase in percentage, so growth factors could be searched in other geographic areas. As life in the Western European countries is attractive to working-age population, it is expected that the people in these countries will increase as a result of migration, which will reflect favourably on the prospects for increasing fish consumption. Rising line of consumption could be observed both in the new Member States and in the countries of Central and Eastern Europe, provided that the process is carried out in parallel with an increase in quality of life.
* **Changing consumer preferences** for fish species. There are several factors to changing consumer preferences in the Member States. On the first place it is the reduction of natural stocks of biomass in the marine waters for species such as cod, sole etc., accompanied by significant reduction in the consumption of herring. On the other hand it is the increased production of sea-bream and seabass in the countries of Southern Europe, as well as an increased demand for salmonidae in the countries of the Baltic region. There is also an increased consumption of molluscs especially in countries such as Italy, Spain and France. A growing demand for new species is observed to satisfy the qualitative and quantitative consumer expectations. This demand is directed to products made of fish with white meat, boneless fish fillets without a sharp taste and at an affordable price. For this reason, over the last 20 years the European market necessitated species that are not of high value such as Pangasius, Nile perch, Tilapia, Hoki, Pollock, etc. Although these species are not characterized by excellent taste, they have a large volume of sales and are well established on the European market. These types can be replaced quite successfully by warm-water species such as catfish, pikeperch, perch, sturgeons, etc. produced in Bulgaria.
* **Demand by state of the products** – over 50 % of demand for fish in the European market falls on **fresh fish** from both households and catering. The increasing popularity of Sushi industry and the innovation in packaging of the products in order to preserve them for longer time contribute to the stability and increase of this share of sales. **Frozen** products are successfully implemented in almost all markets, and there is increase in demand for cooked meals, breaded fillets and other fish products. A trend is reported for reducing the consumption of **canned and pickled** products at the expense of increasing the share of **dried/salted and smoked fish** (leading species are salmon and cod) mostly in Spain and Portugal. Bulgarian producers could successfully establish varieties of products that are suitable for this type of processing (trout, sturgeon, etc.).
* **Distribution channels** – from 50 % to 80 % of the products in the countries with high consumption per capita are realized in the large chain stores and supermarkets. A trend is reported towards reducing the share of sales in small specialized shops and markets of producers compared to the ordinary stores. This fact should be taken into account by Bulgarian producers when entering foreign markets and in order to meet the quantitative requirements if necessary they should look for partnerships and other forms of production organization .
* **Purchase costs** – the prices of fishery products, measured by the index of purchasing power of the population in the EU are wide-ranging with the highest in Scandinavian countries. The lowest prices for fishery products are recorded in Bulgaria, Romania, Czech Republic, Slovakia, Poland, the Baltic States and Portugal.

## Funding of Aquaculture Sector

Funding for the "Fisheries" Sector in the pre-accession period (2000-2006) through the SAPARD program of the European Union amounted to EUR 12 million. These funds have been allocated to the fisheries sector in order to meet EU requirements in the field of sanitary and hygienic conditions and safety of labour and food. For the whole programming period 14 processing plants and 26 fish farms have concluded contracts. Given the scarce resources of the program, the effect of its application is more tangible in plants for fish processing, while in aquaculture the number of enterprises that have received support is under 10 %.

For sector aquaculture the realized projects are 15 and they are funded in the amount of 4 750 000 levs. The annual production of these farms is in the amount of 22 473 tons or nearly 1/3 of the annual production of Bulgaria.

Operational Programme for Fisheries Sector Development 2007-2013 is the first program designed to support large-scale development of aquaculture. With its budget of BGN 54 million[[4]](#footnote-4), measure 2.1 provides rapid influx of investment in the sector in a time of global economic and financial crisis.

The Managing Authority of the program has concluded 64[[5]](#footnote-5) active contracts for grants in the amount of BGN 57,632,444. The total value of the projects amounts to BGN 96,796,992. Currently executed effective payments to beneficiaries are 36.32% of the projected budget for this measure.

The following information can be summarized from the implementation of measure 2.1 to date:

* The scope of the project funding is heterogeneous. Funded projects are in both marine and freshwater aquaculture, and are implemented by various systems - extensive, net cage, collector and recirculation.
* Supported are both the traditional cultivated fish in Bulgaria (carp, grass carp, silver carp, catfish, and rainbow trout) and species such as sturgeon, pikeperch, etc.
* The wide range of assistance allows supporting of existing and newly created companies that produce products to meet consumer demand, and processing and export of fish and other aquatic organisms.
* Given the increasing interest for that type of financial assistance , it can be considered that it is still necessary to improve the economic, social and environmental level of the companies by making additional investments by the farm owners.
* The introduction of advanced and modern technologies in the country requires technological period of time for preparation of investment proposals (period of approximately one year) and two years project implementation period

Related to "Aquaculture" Sector are also measure 2.2 "Aqua-environmental measures" (2 contracts) totalling BGN 84,781.43 and measure 3.5 "Pilot Projects" (1 contract) totalling BGN 131,231.6.

All activities under the approved projects (22 projects totalling BGN 6 791 million) under measure 3.4 "Promotional Campaigns" are directed at increasing domestic fish consumption in the country.

According to the approved production projects for funding under Operational Programme for Fisheries Sector Development (2007-2013), as a result of the program had been supported the construction of production capacity for carp and carp fish for 1340 tons. Production will be implemented in 8 net cage fish farms and in 10 basin farms. Regionally the funded projects are distributed as follows: Pazardjik – 2, Plovdiv – 2; Sofia – 2, Veliko Tarnovo – 2; Kardzhali – 2, and in Vratsa, Lom, Shumen, Silistra, Montana, Stara Zagora, Haskovo and Lovech per one.

Under OPFSD was funded the production of 2048.5 tons salmonids in 8 net cage fish farms and 5 basin farms. Regionally the funded projects are distributed as follows Blagoevgrad – 2; Plovdiv – 2; Smolyan – 2; and in Pazardzhik, Sliven, Kardzhali, Varna, Lom, Montana and Haskovo per 1.

For the production of black mussels were funded 16 projects with production capacity totalling 6180 tons. The farms will be built on the territory of Bourgas Region and Dobrich Region.

As to the date of this analysis, had been funded projects the realization of which will lead to the production of hydrobionts (mussels and fish) in aquacultures amounted to 11 000 tons.

In case of preserving the production volumes of the other farms in the country or a volume of about 7500 tons, the estimated total quantities of production in 2020 will exceed 18 000 tons.

During the next programming period 2014 - 2020 the sector will receive again the possibility of support from the European Maritime and Fisheries Fund. For this purpose NAFA will elaborate Maritime and Fisheries Program from 2014 to 2020.

According to the Treaty of Accession of Bulgaria to the EU, fish farming is part of the "Livestock" Sector and administering authority on the support scheme in the form of state aid is the Ministry of Agriculture and Food. As a governmentally funded sector it is not treated equally compared to other Livestock Sub-sectors. The Government aid is not yet planned annually and do not cover all types of farms. Operators have no security for the receipt of funds they can use to enhance the competitiveness of their production.

By the Advisory Board to the Minister of Agriculture (which is set up in the Action Plan of this document) will be drawn up policies to support freshwater and marine aquaculture, as well as funds for the maintenance of broodstock and specialized production of fingerling when possible and subject to the regulations on the state aid of the community.

## Environment

Water resources in Bulgaria are negligible – about 20.1 billion m3. In water resources per capita the country ranks last among those at the Balkan Peninsula. Bulgaria is one of the most water-poor countries in the European Union. Water resources are unevenly distributed throughout the territory of the country. Irretrievable losses as a result of irrigation and other purposes amounted to 2.52 billion m3. The main part of the river flow – 81.3% is formed on the territory of mountains and hilly parts of the country. The total volume of fresh water storage reservoir in natural lakes is 1% of the aggregate volume. The dam reservoirs are containing 6.66 billion m3 (33% of the potential water resource of the country). About 8 billion m3 water mass (40% of the water resources of the country) is regulated in those damns annually. Groundwater resources are an integral part of water resources in the country (44% of total water resources) and 16% of the total water resources of the country in exploitation The average multiannual volume of groundwater resources of the country are 9,485 billion m3, but the operating reserves are 3.31 billion m3,without the reserves of the rivers that potentially could be included. Depending on the humidity in a particular year, the country collects between 9 and 24 billion m3 of water, not including the waters of the River Danube. Average annual amount per capita is about 2300-2500 m3 (average for Europe it is 5300 m3).). About 44 % of water is used for irrigation, 13% for drinkable water supply, and 43% for industrial use. The country relies on greater use of the Danube waters, but they are very much polluted. The same relates to all Bulgarian major rivers. The degree of pollution of the individual basins is different and it depends on the number of pollutants, the quantity and quality of wastewater (organic and inorganic, toxic and harmless) and the volume of river flow. The main sources of pollution are the industrial wastewater from the pulp, yeast, chemical, ore-dressing, canning, and local and textile industries. Besides the pollution of organic and inorganic substances, lately increasing importance has the so-called thermal pollution of the river water. It is caused by the increase in the water temperature above normal for specific season that result in disturbances in the ecological balance and negative changes in the river flora and fauna. Usually after a single use the industrial water is not being treated or it is partially purified, and thus water becomes inoperative.

Freshwater resources are controlled under the Water Act considering the global change in the flow-forming climatic factors in the region. Waters in Bulgaria are used by authorization unless excluded by law. Permits are issued by the Minister of Environment and Water – for the complex and important dams, and by the mayors for the municipal dams, and in the other cases – by the directors of River Basin Directorates.

### Rivers

Length of the flowing water in the country is 20,231 km. Rivers’ flow is formed almost entirely in mountainous areas, where there is a dense network of tributaries. Flowing through the plains and lowland areas, they meet less tributaries and are rather transit flows for the areas. These are almost all the major rivers that cross the Danube Valley and the Upper Thracian Plain. At most Northeast Bulgaria lacks running water. Rivers of Bulgaria are related to the two catchment areas - Black Sea and Aegean (White Sea) area. The main watershed between them goes along the ridge of the Balkan Mountains, in the western part deviates to the south and around the spring area of Rila, Iskar River and then along the ridge of the mountain Plana-Zavala. Because of the small and complex topography of territory of Bulgaria rivers are relatively short, with no large water catchment area and therefore they are not very deep. The rivers are product of climate. They reflect differences in both - the amount and the rainfall patterns in different parts of the country. All rivers in Northern Bulgaria have spring-summer freshet, and the rivers in southern Bulgaria and the Black Sea coast early winter-spring freshet. Unequal distribution of river water during the year creates serious difficulties for their use. There are not rare cases of flooding, causing major damage to the economy. With a purpose to regulate river flows in the country were constructed around 2200 dams of different size. Most of them are micro-dams.

 Water regime of rivers in the country is characterized by two distinct periods - high water and low water. Main factors are climate and diversity of topography of the country. For the Danube valley - the regime of high water is in February, March, April. For Balkan part due to the mountainous nature with high altitudes, the maximum runoff is during March, April. The rivers’ water in the region of Pirin and Rila has its maximum during May, June At the time of high water in the rivers drain more than 50% of the annual volume of runoff.

There are 15 major river basins in the country which are polluted by 4,200 industries of which 3115 are in need of treatment facilities. Industry is the largest source of water pollution in Bulgaria (91.7%), this sector has the strongest impact on polluting waters: Provadiyska river, Aitoska, Vit, Tunja, Mesta, Maritsa, Iskar and Ogosta. Provadiyska River is the most polluted river in Bulgaria, nearly 45.8% of all pollutants registered in the rivers of the country could be registered in the water of this river. This pollution is caused by the complex of the chemical industry - Devnia. There is a strong pollution of the rivers Maritsa (15.6%), Iskar (4.9%) Tunja (2.9%), Vit and Yantra (1.8%) Ogosta (1.6%), Struma ( 1.5%), Kamchiya (1.1%) and Arda (1%).

To improve the condition of the river water is necessary to take measures for wastewater treatment, and as during the preliminary study and the design phase should be introduced new technologies with proven capacity for recirculation of water with high economic impact and reduction of the level of wastewater contamination.

### Lakes and Dams

In Bulgaria there are about 400 lakes, but they are small in size with a total area of 95 sq. km. They are formed in circuses, separated by moraines. Often they are located stepwise and drain into one another, giving rise to new rivers. Better known glacial lakes in the Rila Mountain are the Seven Rila Lakes, Musala lakes, etc. The largest lakes in the country are formed near the Black Sea – Varna Lake, Lake Burgas, Durankulashko lake and Shablensko Lake, etc. from the river-side lakes is preserved only Srebarna Lake, which is declared as a nature reserve. In our country there are karsts, tectonic and landslide lakes.

For the needs of the power sector, irrigation and water supply of settlements,, it is necessary to adjust river flow through the construction of dams, because of the uneven river flow. . At the time, this fact was taken into consideration in the country and currently there are more than 2 200 dams with a total storage reservoir volume of about 7 109 000 m3, but for the most part they were constructed more than 30 years ago. Large and economically significant dam lakes (52 dam lakes as defined in the Water Act) are mainly used for drinking water, irrigation, electricity generation, the development of aquaculture in net cage fish farms and recreational fishing. Small and medium-sized dams are subject to recreational fishing and leisure (extensive or semi-intensive) fish farming. The use of dams for aquaculture production is an opportunity for different regions of the country to diversify the spectrum of production.

The total water area, including inland waters of the country, that were used for aquaculture is 55 362.5 acres as of April 12, 2013 according to data from the NAFA statistical information system.

### Coastal Waters

The Black Sea coastline has a length of 378 km. Territorial sea area of the country (up to 12 miles inside) is 6506 km². The area of the continental shelf is 10 886 km², and the economic zone in the Black Sea is 25 699 km².

The limiting factors for the development of aquacultures in the Black Sea coast are several. Environmental conditions in the Black Sea differ from the conditions where develop marine cultures in Western European countries and other developed sea countries in that respect. In these countries the aquaculture facilities are installed in well protected of rough waters areas such as estuaries, fjords and heavily carved inland bays. Along the Bulgarian seaside such places are missing, which necessitates the use of gale-resistant facilities in unprotected areas of rough waters. This undoubtedly increases the cost for production of marine cultures. More significant dampening fish production factor is the temperature regime of the Black Sea waters in annual term. The appropriate temperature range for the active growing season for the fish (feeding and growth) in the Black Sea is considerably shorter than in the Mediterranean sea, thus obtaining a ready market production of sea bream and/or sea bass (most popular fish species in the Mediterranean sea, that are reared in cages) in our country requires a long-term cultivation (instead of one – for two calendar years), which raises the cost of production and makes it uncompetitive. It must also be added the production risks during the often very unfavourable conditions in the winter months and weight losses due to the inability to feed the fish. Such factors also adversely affect the cost of production of marine organisms and makes it more disadvantageous compared with the competition of the Mediterranean coast. High summer temperatures in the region of the Black Sea coast also limit the cultivation of a variety of fish species, such as the trout. In same time, there are favourable conditions for the establishment of mussel farms along our coast as grown-up mussels are of good quality and high yield. Particularly promising is the creation of a closed cycle of production through the construction of processing plants to the mussel plantations.

Another significant factor with a negative effect on the development of marine aquaculture is the strong anthropogenic pollution, resulting in significant eutrophication and the emergence of "blooms" causing "oxygen deficit" and “suffocation” in the affected areas in the coastal region. Establishment of treatment facilities and preventing the availability of oil products in the water (especially important issue for the Bourgass region) will enable the development of marine cultures in more parts of the Black Sea coast.

### Ground waters

Bulgaria has 135 distinct with karsts waters, which cover approximately 40% of all groundwater. The most famous karst springs in Bulgaria are: Devnia springs, Glava Panega springs, Iskretski springs, Razlog springs, Kleptuza in Velingrad, etc.

## Legal and Administrative Provisions Relating Environment in Connection with the Development of Aquaculture Sector

### International Conventions and Agreements

Legislation in the Republic of Bulgaria relating to the preservation of nature in particular includes the national laws and regulations, and the international conventions. According to the Constitution of the Republic of Bulgaria as part of international law, conventions which have been ratified by the National Assembly are binding on Bulgaria and have priority to domestic law in case of conflict with them. Bulgaria is a party – a participant in the following signed and ratified global and European conventions

* *Convention on Biological Diversity*
* *Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, CITES)*
* *Convention on the Conservation of Migratory Species of Wild Animals (Bonn);*
* *Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar);*
* *Convention on the Conservation of European Wildlife and Fauna and Natural Habitats (Bern);*
* *Convention for the Protection of the World Cultural and Natural Heritage.*

Conventions aimed at a specific geographical region and containing general instructions for using it:

* *Convention on the Protection and Use of Transboundary Watercourses and International Lakes ;*
* *Convention on Cooperation for the Conservation and Sustainable Use of the Danube*
* *Convention for the Protection of the Black Sea*

Conventions aimed at protecting specific species:

* *Convention on the Conservation of European Wildlife and Fauna and Natural Habitats (Bern Convention);*
* *Convention on the Conservation of Migratory Species of Wild Animals ( Bonn Convention ) ;*
* *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) – introduces a variety of tools for the conservation of sturgeons, including the introduction of export quotas for caviar of sturgeon species, the introduction of authorization for legal traders of caviar sturgeon, the introduction of a registration system for caviar processing enterprises, universal labeling system, etc.*

### National Legislation

* *Biological Diversity Act (BDA)* – BDA transposes the basic principles and requirements of the Birds Directive and the Habitats Directive. The Law regulates the establishment of the National Ecological Network as part of the European ecological network Natura 2000.
* *Fisheries and Aquaculture Act (FAA)* – registration of persons keeping and breeding fish and other aquatic organisms, control of fisheries and aquaculture; introduction of bans on fishing during spawning, in certain subjects or areas thereof; introducing temporary bans on catch in change in the status of stocks of certain fish species; introduction of specific prohibitions on the use of equipment and gear for catching fish; aquaculture development as a measure limiting pressure on natural resources.
* *Water Act (WA)* – regulates key issues concerning the rules for the use and protection of water resources.
* *Environmental Protection Act (EPA)* – fundamental law, the provisions of which are developed in numerous special laws such as the BDA and the FAA.
* *Veterinary Law, Food Law, Law on the Bulgarian Agency for Food Safety* - Control of production, transport, processing and marketing of fish and fish products.
* *Ordinance* on the conditions and procedures for assessing the compatibility of plans, programs, projects and investment proposals with the object and purpose of the conservation of protected areas (adopted by Decree № 120 of 31.08.2007 of the Council of Ministers, promulgated in State Gazette No. 73 of 11/09/2007).
* *Ordinance № 37* of 10.11.2008 on the use of dams – state property, in regard to fish husbandry and the conduct of business, recreational fisheries and aquaculture production sites – state property, under Article 3, paragraph 1 of the Fisheries and Aquaculture Act (promulgated, State Gazette No. 100 of 2008,. Amended and supplemented. State Gazette No. 18 of 01.03.2011).
* *Order № РД -09-43/20.01.2012* of the Minister of Agriculture and Food on ban on sturgeon species catch in Bulgarian waters of the Danube and the Black Sea for a period of 4 years as of 01.01.2012 on.

### Legislation of the European Union for Conservation of Nature

* *Council Directive No. 92/43/EEC* on the conservation of natural habitats and wild fauna and flora. European Habitats Directive (92/43/EEC), regulating the conservation of natural habitats and of wild fauna and flora, requires member states of the European Union to take adequate measures to maintain or restore certain habitats and species by providing their favourable conservation status within their natural distribution area (European Commission, 1992). For executing the main purpose of the Habitats Directive shall establish a European system of special areas of conservation (SACs), which together with the Special Protection Areas (SPAs) under the Birds Directive form the Natura 2000. According this Directive, a number of water areas of Bulgaria are set as special Areas of Conservation due to fish species of Community importance and described in Annex 2 of the Directive. The effective management of protected areas with fishes from Annex 2 requires the creation and implementation of monitoring programs to ensure adequate assessment, both in terms of their conservation status, and in terms of their spatial distribution.
* *Water Framework Directive (WFD)* (Directive 2000/60/EC of the European Parliament and Council, 2000). The overall objective of this Directive is to achieve good ecological status of surface waters (rivers, lakes/dam lakes) by 2015. To achieve this objective, the Directive introduces a new, integrated approach to assessing the status of surface waters, which is based on the concept of water ecosystems.

### Strategic Documents and Plans

* Strategic Plan for Biodiversity 2011-2020 and the Aichi targets for biodiversity;
* EU Strategy on Biological Diversity 2020;
* National priority action framework for Natura 2000;
* National Action Plan for the conservation of the most important wetlands in Bulgaria.

### NATURA 2000 in Bulgaria, protected areas under Directive 92/43/EEC (Habitats Directive)

Bulgaria is one of the EU countries with the richest biodiversity. This also determines the size of the protected areas network in Bulgaria. Protected areas under Directive 92/43/EEC in Bulgaria are 234, protected are 90 habitat types and 121 species of plants and animals, including – 24 species of fish. Under the Birds Directive are defined 118 protected areas, 13 of them overlap with protected areas under the Habitats Directive SCI areas. Subject to protection are 120 species of birds and 70 species of migratory birds that are not covered by Annex I of the directive. The habitats and species subject to conservation areas are set out in the Annexes to the two directives and in Annexes 1 and 2 of BDA. The main purpose of the network of protected areas is to protect species and habitats to achieve *favourable conservation status (FCS)*.

Favourable Conservation Status is a measure for evaluating the effectiveness of the implementation of Directive 92/43. The status of a species is considered favourable when its population and natural habitat are stable or increasing, and there is a large enough area of habitats to sustain its population. The condition of the habitat is considered favourable when the area that it covers is stable or increasing, its structure and functions are stable and the status of its typical species is favourable.

Protected areas under the two European Directives comprising the European ecological network Natura 2000 in Bulgaria cover 35% of the country’s area.

In connection with the implementation of the commitments of the Republic of Bulgaria in accordance with Article 8 of Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, a national framework for priority action under Natura 2000 (NFPA) 2014 – 2020 was developed. The purpose of NFPA is to better define priorities for Natura 2000 at national and regional level, and to determine the financing needs. This document will facilitate the integration of the above mentioned needs into future programs financed by EU financial instruments.

There is also a developed and adopted National Information and Communication Strategy for the network Natura 2000 (NICS) in order to support the whole process of communication of Natura 2000 in the next ten years. The implementation of the communication objectives formulated by NICS, is a tool for more efficient management of processes related to the development, validation and operation of the Natura network in Bulgaria. These processes require broad public support and high level of public awareness of all participants in them. It brings forward the need for an unified communication policy to consolidate structure and channel the available information, to achieve a better understanding of all stakeholders of the important aspects related to the ecological network.

### Protected Fish Species

The particular geological and geographical location of Bulgaria has determined the formation of a wide variety of species of aquatic organisms. It has a significant number of endemic species, unique to our or the Balkan Peninsula waters. Therefore, nowadays the protection of the genetic pool and natural fish populations in the country are becoming increasingly important in national, regional and even global scale.

Using modern internationally accepted criteria and categories of IUCN was committed updating in the list of endangered species in Bulgaria in the new edition of the "Red Book of Bulgaria" (Golemanski, 2011).

With regard to Directive 92/43/EEC of the Council on the conservation of natural habitats and of wild fauna and flora, in Annex № 2 of the Biodiversity Act were included the following fish species: Lampreys (Eudontomyzon spp.), Umbra (Umbra krameri), Asp (Aspius aspius), Southern (Balkan) barbel (Barbus meridionalis petenyi) Rezovska (Primorska) barbel (Barbus tauricus /Barbus plebejus tauricus) Maritsa barbel (Barbus cyclolepis/Barbus cyclolepis tauricus), Bleak (Danube bleak, Oblez) (Chalcalburnus chalcoides), White-finned gudgeon (Romanogobio albipinatus/Gobio albipinatus), Balkan gudgeon (Romanogobio uranoscopus/Gobio uranoscopus), Amur bitterling (Rhodeus amarus/Rhodeus sericeus amarus), Mountain chub (Leuciscus souffia), Ziege (Pelecus cultratus), Balkan loach (Cobitis elongata), Loach (Normal loach, Zmiorche, Piskal) (Cobitis elongatoides/Cobitis taenia elongatoides), Struma loach (Cobitis strumicae /Cobitis taenia strumicae), Weather loach (Misgurnus fossilis), Balkan loach (Liskur, Lingur) (Sabanejewia balcanica/Sabanejewia aurata balcanica), Danube (Bulgarian) loach (Sabanejewia bulgarica/Sabanejewia aurata bulgarica), Bullhead (Cottus gobio), Mackerels (Alosa spp.), Danube ruffe (Gymnocephalus baloni), Striped ruffe (Gymnocephalus schraetzer), Apron (Zingel spp.)

Protected species included in Annex No. 3 of the Biodiversity Act in Bulgaria are: Atlantic sturgeon (Acipenser sturio), ship sturgeon (Acipenser nudiventris) and Danube ruffe (Gymnocephalus baloni).

Under the regime of protection and regulated use are the species included in Annex No 4 of the Biodiversity Act: Russian sturgeon (*Acipenser gueldenstaedti*) Sterlet (*Acipenser ruthenus*), stellate Sturgeon (*Acipenser stellatus*), Beluga (*Huso huso*), Rezovo Pontic shad (*Alosacaspia bulgarica*), Small Danubian mackerel (*Alosa caspia nordmani*), Twaite shad (*Alosa fallax nilotica*), Black Sea Shad (*Alosa maeotica maeotica*), Pontic Shad (*Alosa pontica pontica*), Asp (*Aspius aspius*), black (Balkan) barbel (*Barbus meridionalis petenyi*), Rezovska (seaside) barbel (Bar*bus tauricus/Barbus plebejus*), Marista barbel (*Barbus cyclolepis/Barbus cyclolepis tauricus*), Ziege (*Pelecus cultratus*), Striped ruffe (*Gymnocephalus schraetser*), Apron (*Zingel zingel*)

### State of the Biological Resources of Valuable Species in the Inland Waters of Bulgaria and the Black Sea

#### Policies in Bulgaria and National Legal Framework Regarding Protection and Using Sturgeons Species

All sturgeon species are included in Annex II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora CITES. In order to implement the procedures of CITES, the general rules for the preservation of sturgeon species are incorporated in the Biodiversity Act. According to the Biodiversity Act, the Ministry of Environment and Water and the Ministry of Agriculture and Forestry issue orders about introducing procedures and conditions for preservation.

Sturgeon species are listed in Appendix No. 3 (ship sturgeon and European sea sturgeon) and Annex No. 4 (Russian sturgeon, sterlet, Stellate sturgeon, beluga) of the *Biological Diversity Act (BDA*); based on the provisions of the Biological Diversity Act was created an Action Plan for Sturgeon Species in Bulgarian Waters of the Danube River and Black Sea.

#### State of the Turbot Population in the Bulgarian Black Water Aquatory

For some species subject of commercial fisheries in the Black Sea were assumed certain catch quotas. The quoted species are turbot (*Scophthalmus maximus*) and sprat (*Sprattus sprattus sulinus*). Following the country's accession to the European Union, the amount of catch quotas in the Black Sea for Bulgaria and Romania, for the years in concern is defined in Regulation (EU) No. 1579/2007, No. 1139/2008, No. 1287/2009, No. 1004 / 2010, No. 1256/2010, No. 5/2012 and No. 1261/2012.

Implementing the National Programme for the collection, management and use of data in the "Fisheries" Sector, the Institute of Oceanology, BAS, annually conducts a bottom exploration study in the Black Sea together with partners from Romania. Data from recent studies indicate deterioration of the turbot population. This is confirmed also by the survey in May 2012, which shows a decrease of the relative turbot biomass to very low values, a very small number of fishes caught during the study (26 individuals caught for committed 40 bottom trawling), low numbers per unit area (11.25 ind/km2). Data on the size and age structure of the population of turbot in 2012 indicate that the stock is in poor condition. Scientists from IO-BAS recommended reduction of the fishing effort on the population of turbot to the Bulgarian coast, especially before the period of breeding season and introduction of additional and more effective measures than the current catch quotas and technical measures. The assuring of effective control of the turbot catches is achieved through application of the measures in the Specific Plan for Monitoring and Control of Turbot in Black Sea.

**Table 8** Data on the size of the quota, catches and relative biomass of turbot (*Scophthalmus maximus*), for the period 2008-2012

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  **Year****Indices** | **2008** | **2009** | **2010** | **2011** | **2012** |
| **Quota, tons** | 50 | 50 | 46 | 43,2 | 43,2 |
| **Catches, tons** | 54,7094 | 52,07445 | 46,24314 | 37,7468 | 36,362 |
| **Biomass, tons** | 1966,18 | 1555,94 | 633,120 | 263,29 | 191,48 |

**\*** *According to the ESC NAFA Institute of Oceanology, pursuant to Regulations (EU) No. 1579/2007, No.1139/2008, No.1287/2009, No.1004/2010, No.1256/2010, No.5/2012.*

# Strategic Approach to the National Objectives

The strategic approach to the national objectives of member states is expressed in the development of strategic documents from the relevant institutions, responsible for the implementation of sectorial policies in the countries.

Main national development objectives are included in the draft partnership agreement of Republic of Bulgaria and the EU for the period 2014-2020 and in the National Development Plan Bulgaria 2020.

Table 9 Basic Objectives of Development of Bulgaria and EU

|  |  |  |  |
| --- | --- | --- | --- |
| **Indice** | **Current (initial) state** | **National objectives according National Development Program Bulgaria 2020** | **Strategy Europe 2020** |
| 1. Employment rate of the population aged 20-64 years  | 63,9%, 2011 г. | 76% | from 68,6% in 2011 to 75% in 2020 г. |
| 2. Share of investments in Research and Development from the Gross Domestic Product | 0,57%, 2011 г. | 1,50% | 3% |
| 3. Carbon dioxide emissions | 47,8%, 2010 (1988=100%) | Increasing the level of Greenhouse Gas Emissions (GHG) outside EU Emission Trading Scheme (EU ETS) with not more that 20% till 2020 compared with 2005 | reducing by 20% (30%) compared to 1990 |
| 4. Share of renewable energy in final energy consumption | 13,8%, 2010 | 16% | 20% |
| 5. Increasing of energy efficiency |  | by25% | by 20% |
| 6. The share of early school leavers | 12,8%, 2011 | 11% | from 13,5% in 2011 to 10% in 2020 |
| 7. Share of population aged 30-34 years having graduated higher education | 27,3%, 2011 | 36% | from 34,6% in 2011 to 40% in 2020 |
| 8. Number of Europeans living below the national poverty limit | 1683 thousand people, 2011 | reducing by 260 thousand persons the number of population living in poverty  | reduction by 25%, or 20 million people |

Farms for cultivation of **bivalve molluscs (mussels and oysters)** play specific role in **reduction of emissions and** **absorption of carbon dioxide as a mean to combat climate change**. They include in their shells carbon dioxide in the form of calcium carbonate (limestone) and in this way contribute to its permanently removal from the atmosphere. It can be released back only at temperatures above 800˚C or under chemical reaction, so the projects in this area have a priority over projects for reducing emissions, and at the same time be profitable for those who breed such aquaculture.

**"Fisheries and Aquaculture"** Sector has a specific position and role for both the agricultural sector and the national economy. The sector is relatively small, but nevertheless it provides high employment level at regional level, especially in coastal areas where it has a significant contribution to local economies. The share as a contribution to the national economy is less than 0.5% of GDP[[6]](#footnote-6). In 2011 the production of fish, other non-fish aquatic organisms and their products in Bulgaria remains low compared to the production of the other EU member states with access to river/sea and the country remains a net importer of fish and fish products. At the same time there is an increase in the average level of consumption of fish and non-fish aquatic organisms in Bulgaria, as it is already 5.3 kg/year per capita while the level of consumption in 2007 was 3.5 kg/year[[7]](#footnote-7).

***The main problems of the sector are resulting from:***

1. ***Limited access to financial resources;***
2. ***Inadequate equipment and outdated production facilities;***
3. ***Inadequate infrastructure;***
4. ***Insufficient use of scientific advances and new technologies in the sector;***
5. ***Scattered legal framework, different responsible institutions, inconsistent procedures;***
6. ***Outstanding opportunity for long-term use of the water sites - this problem creates uncertainty among operators and does not stimulate investment;***
7. ***Fragmentation of the sector - the main operators are micro and small farms, and rarely medium-sized enterprises;***
8. ***Lack of strong associations of producers and industry organizations that are able to support the work of their members;***
9. ***Senescent workforce - the average age of employees in the sector has sustained upward trend;***
10. ***Lack of unified and systematic information on the sector – currently information on activities in the aquaculture sector is collected by a number of institutions (NAFA, Bulgarian Food Safety Agency, Customs Agency, National Statistical Institute, etc.). It is identified a lack of a unified basis for collection and processing of economic data, as well as the need to provide reliable sources for their supply. This prevents the development of sectored analysis with a long enough time range to ensure the development of a reliable prognosis and conclusions for the sector development.***
11. ***Lack of structured market of the sector - there is no effective auction market for the products of the sector;***
12. ***Ineffective control of the state and the lack of traceability of the production from the sector ;***
13. ***Lack of skilled workforce, incentives for acquisition of professional skills.***
14. ***Traditionally low consumption of fish and fish products per capita in the country.***

Fishery, aquaculture and the related processing industry have the lowest potential for creating additional employment and economic growth compared to other sub - sectors of the agriculture sector. It should however, be emphasized that the sector plays a significant role at local level for some regions of the country.

The “Aquaculture” sector can contribute to achieving the overall objective of the Union – to fill the gap between consumption and production of aquatic organisms, mainly saltwater (according OPFS) in the EU in a sustainable environmentally, socially and economically friendly way.

To achieve the objectives outlined in the Common Strategic Framework (CSF) of the EU concerning the Aquaculture Sector, each Party shall develop national multiannual plan, for which the Commission gave the following guidelines resulting from the analysis of the sector development at European level for the past seven years:

**Simplification of procedures for authorization/registration of activity in the sector**

According to the analysis done, the duration of the period of authorization/registration of activities for aquaculture production in the different Member States is between 12 months and seven years, which significantly hamper the development of the sector.

**Ensuring sustainable development and growth of the aquaculture sector through coordinated spatial planning**

In a view of the fact that spatial and environmental capacity in both marine and inland waters are limited, should be implemented the ecosystem approach. Special attention through good planning and assessment procedures should be given where it affects vulnerable and protected areas;

Introduction of a coordinated spatial planning, including marine spatial planning at sea-basin level is necessary to ensure that the potential and needs of aquaculture were taken into consideration also to ensure adequate allocation of space in the water and on land for the sustainable development of the aquaculture sector.

**Increasing the competitiveness of the aquaculture sector in the EU**

The coordinated actions at local level between entrepreneurs, public authorities, associations, research institutions and organizations for education and training can help to stimulate local economies and meet the growing demand for seafood, sustainably produced at local level.

Trade diversification can provide additional sources of income to producers (e.g. integration with recreational fishing and tourism). Development and diversification of business activities can be also promoted by means of market-oriented researches, innovation and knowledge transfer. To this end, Member States should strengthen the synergies between national research programs and to encourage the participation of enterprises in research and innovation process, including in particular implementing the Strategic Research Agenda of the European Technology and Innovation Platform about the European aquaculture as well as the strategy of "blue growth".

The main objective of the parties should be to take full advantage of the offered financial support to stimulate economic growth through appropriate allocation of resources for aquaculture, including the preparation of management and supply plans and to improve the links between research and development, and industry (especially SMEs), and to support educational and vocational programs, covering the needs of the aquaculture sector.

**Promoting an equal basis for operators in the EU using their competitive advantages**

Here the main objective of the parties is to support the development of producers organizations and inter-branch organizations, including at international level. This would facilitate the collective management and/or self-regulatory initiatives between producers, processors and traders in collaboration with consumer associations and NGOs to implement and control the requirements and regulations for quality and labelling.

On the other hand, apart from the specific objectives for development of the sector should also be taken into account the horizontal EU policies in the provision of financial support, namely:

* ***Promote gender equality and non-discrimination***
* ***Sustainable Development***

The findings in the strategic framework at EU level on sub-sector "Aquaculture" are that aquaculture is a sector whose economic scope allows for the creation of **new economic niches such as employment, more efficient use of local resources and opportunities for investment in production and it should be leading to sustainable development.** With the help of **advanced research and technology, aquaculture should become compatible with the environment industry**. The application of **high standards** would also improve the image of the aquaculture sector and would facilitate its access to the markets, and improve the market positions.

The conclusions from the analysis of the EU Common Strategic Framework relevant to the **"Fisheries" Sector encompassing all activities on catching fish, production, processing and marketing of fish and fish products** specifically for Bulgaria are defined as:

*"The significant delay of Bulgaria in terms of technology and research in the field of fisheries and aquaculture compared to other Member States, require from the sector the needs for reorganization and modernization in order to meet European standards. Only in this way it can remain competitive and shall have sustainable development."*

The Bulgarian administration in the person of the Council of Development to the Council of Ministers and the Interdepartmental working group to it comprising representatives of all ministries, has developed a strategic vision for the development of the Republic of Bulgaria, expressed in the "Strategic Framework of National Development Programme of Republic of Bulgaria: Bulgaria 2020". According to the vision of the document: *"By 2020, Bulgaria should be a country with a competitive economy, providing conditions for full social, creative and professional development of personality through smart, sustainable, inclusive and regionally balanced economic growth."*

To achieve the strategic vision were established the following objectives:

* Raising the standard of living through competitive education and training, creation of conditions for quality employment and social inclusion, and ensuring affordable and quality health care.
* Construction of infrastructure networks, providing optimal conditions for economic development, and quality and healthy environment for the population.
* *Improving the competitiveness of the economy by providing a favourable business environment, application of innovative solutions and increase resource efficiency.*

The achievement of these objectives will be accomplished through the following priorities:

* Improving the access and quality of education and training, and the quality of the labour force;
* *Reducing poverty and promoting social inclusion;*
* Achieving sustainable integrated regional development and use of local potential;
* *Development of agriculture to ensure food security and production of products with high added value in sustainable management of natural resources;*
* *Support for the development of highly advanced industrial base and modern innovative infrastructure , promoting innovative activity and research;*
* Strengthening the institutional environment for higher efficiency of public services to citizens and businesses;
* Establishment of adequate energy infrastructure, support for increasing resource efficiency and reducing energy dependence;
* Improving transport connectivity and access to markets.

One of the sub-priorities of our national policy is "Creating a competitive fisheries sector, ensuring sustainable management of fisheries and aquaculture."

## National Growth Target (2014—2020)

After consideration of national assets and resources definite optimal activities differentiated by various production systems will be identified to be a subject of promotion. Also, the types of fish and non-fish hydrobionts with the potential for diversification of production and value addition will be defined. The measures to promote environmental and social sustainability will be identified, also measures for promotion of products and increase the attractiveness of the sector will be set up. The strategic choice for development of the sector in the current document will be aligned with the EU production, the production of the Balkan region, and also imports from the EU and third countries. In order the sector to be competitive, the production needs will be optimized initially to the levels of countries similar as a territory in the European Union.

For the establishment of export-oriented, economically viable and socially and ecologically sustainable aquaculture sector is necessary to restructure the existing farms in the country by increasing the production capacity to reach production levels of similar in population and territory EU countries. The increase in production capacity should be done through diversification of production in line with market demand, the introduction of innovative technologies and optimization of existing production capacities. Enhancing the competitiveness of the sector will be achieved also by restructuring the farm, as well as by adding value to products and activities carried out by operators. The following sub-targets will help to deliver the vision for the development of the "Aquaculture" Sector:

* Improving the competitiveness of the aquaculture sector and supporting the research and development activity;
* Approval of indicators for environmental, economic and social sustainability;
* Promotion of the economic activity in the sector;
* Diversifying and improving the quality of life in coastal and rural areas;
* Equal basis and security of the operators in the aquaculture sector in relation to the access to waters and environment;
* Administrative simplification in particular with regard to licenses;
* Evaluation of other possible cross-border effects on neighboring Member States.

Creating a competitive, economically viable and sustainable in social and environmental aspects units for aquaculture, through optimization of resources, restructuring activities and increase the production capacity of the sector

Confirmation of Indicators for environmental, economic and social sustainability

Improving competitevnes of the aquacultue sector and support for research and development activities.

Diversify and improve the quality of life in coastal and rural areas

Stimulation of the economic activities in the sector

Administrative simplification, in particular in terms of the licenses

Equality and security for operators in the aquaculture sector on access to waters and space

Assessment of other possible cross-border implications for neighboring states

Aquaculture has the potential to create additional jobs and economic growth, and using the structural measures of the European Commission it will be able to get closer to the level of development of other sub - sectors of agriculture, forestry and fishery. Given the need for restructuring of farms to increase production capacity and diversification with species suitable for processing and export, the funds necessary for these activities are significant and will be provided by the European Maritime and Fisheries Fund. Unrealized potential for economic development is available primarily in the development of marine (saltwater production of fish), cold - water aquaculture and export-oriented and suitable for processing warm water species of aquaculture.

***Quantified national target for growth (2014-2020) in this plan is an annual aquaculture production of Bulgarian farms in 2020 amounted to 20,000 tons .***

The quantitative goal is determined, taking into account the following circumstances:

* The total amount of aquatic organisms produced in 2012 (data given by NAFA);
* Said increase in production as a result of funded projects under the Operational Program Development of Fisheries Sector (data from NAFA);
* The expected increase in production as a result of measures funded in the next programming period (expert estimation).

It is important to note that this targeted quantitative objective does not result in mechanical increase of the tones production output, but will be achieved through the implementation of policies for structuring and restructuring of the sector. The policy of diversification of products consists in promoting the implementation of projects for the production of saltwater fish species (including projects for quoting and endangered species such as turbot and Black Sea oyster), cold- and warm-water species with export potential and appropriate processing/treatment. The policy of increasing the competitiveness of the farms will be implemented through measures for financial support to projects for the intensive cultivation of fish and other aquatic organisms by the operators and adoption of innovative and promising technologies. Achieving this objective will be accomplished by supporting the farms, implementation of systems to improve the production performance of water basins and water recirculation. One of the priorities will be financing the farms with an annual production of over 100 tonnes of production, as the contribution of such farms to the sector in supplying the resources to the processing plants, production of fingerling, feed supplies and adding value along the chain of distribution and marketing is huge. Policy in relaton with the diversification of aquaculture activities will be implemented for all types of farms, and with priority will be supported operators of farms for extensive or semi-intensive production cultivation .

# Simplification of Administrative Procedures

## Assessment of the Situation at National Level

### Administrative Organization

Performing the activities for cultivation of fish and other aquatic organisms is administered by the National Agency "Fisheries and Aquaculture" (NAFA). The document regulating the status of the enterprise is a registration certificate under Article 25a of the Law on Fisheries and Aquaculture.

Use of water sites, surface and groundwater and issue of discharging permits is under the responsibility and is administered by the regional Basin Directorates (4 directorates) of the Ministry of Environment and Water. The Directorates control also monitoring and implementation of the principals and rules for ensuring the water quality, as well as activities related to spatial planning. Upon issuance of permits they shall perform also coordination procedures with the Navy Staff, Border Police and the Executive Agency "Maritime Administration" (with the activities on the Danube and the Black Sea).

Ministry of Environment and Water is the body that monitors the compliance with the procedures for the cultivation of non - domestic species and estimates the need to assess the environmental impact assessment at the level of “each individual investment project”. In the Ministry’s prerogatives is also the designation of protected areas and Natura 2000 area network. On the basis of orders issued by the competent authority is determined the project's compliance with the permitted activities.

Ministry of Regional Development is an authority, which allows the cross of technical infrastructure in the land and objects - exclusive state property (dikes, jetties, beaches, etc.), and the Directorate for National Construction Supervision (NCSD – secondary administrator to the Ministry of Regional Development) issues permits for construction and installation works.

Bulgarian Agency for Food Safety is the national competent authority to ensure compliance with the requirements for stock-breeding holdings in carrying out cultivation activities concerning health and animal welfare, fodder, safety and quality of food, as well as the application of hygiene and sanitary package of measures in processing establishments.

NAFA is the Managing Authority (MA) of the Operational Programme for Fisheries Sector development 2007 -2013. It is envisaged that the Agency will be also the MA of the Maritime and Fisheries Programme 2014 to 2020.

### Analysis of the legal requirements and the "administrative burden" for the operators:

Reproduction and cultivation of fish and other aquatic organisms is performed by sole proprietors and legal entities registered in NAFA.

Registration is done separately for each object and it is unlimited.

For entry in the register the applicants shall submit an application to the Head of the relevant territorial unit of NAFA.

Within 14 days of submitting the application, the person shall be registered and issued a certificate of registration. In case of discovered gaps or inaccuracies in the submitted documents, NAFA Executive Director or a person authorized by him within 7 days of receipt of the application shall send a notification to the applicant for correction. The Applicant shall eliminate deficiencies within 14 days of receiving the notice.

The registered persons must submit in NAFA a certificate of registration of stock-breeding project under the procedure of Article 137 of the Veterinary-Medical Act in 30 days of commissioning of the object.

#### Ministry of Environment and Water

The use of the waters and water sites includes water- taking and use of the water site. A license is assured for water- taking and use of water site.

The common water- taking and use of the water sites and the water- taking for satisfaction of private necessities is free of charge.

For water – taking and use of the water sites for business a fee must be paid for using the natural resource as a guarantee for creating equal legal business conditions for all the citizens and corporate bodies. The fees are defined with a Rate of the Council of Ministers.

A license for water- taking and/or use of a water site is required in all cases, with the exception of the following:

* Physical persons – owners or users of immovable property, situated within the borders of the build – up areas and settlements, have the right of free of charge water- taking up to 10 cubic meters per twenty-four-hour period for own necessities from the surface and underground water there, as well as in the cases of use of industrial systems for heating and/or cooling with a total installed power up to 50kW;
* For activities on protection of the population in cases of declared state of emergency under the Disaster Protection Act.
* Development, modernization or technological upgrading of existing systems and technical processes, leading to minor changes in the quantity and quality of the water used, determined by a license issued
* Use of surface water by placing temporary diversion facilities required for the construction of a building site, provided that the water quantity taken is less than 10 liters per second and the resulting runoff after using slightly affected water quality

Water - taking involves the extraction of water from water sites and / or its diversion from them as well as the use of water power.

No license is required for water- taking in case of:

- Transformation of water energy without its diversion from water currents into electricity through turbines with a capacity of up to 20 kilowatts;

- Construction of a well for individual free water- taking of underground water. The owner shall notify the Director of the particular Basin Directorate within three months.

License to use the water site shall be issued for aquaculture and related activities

А) Permit for use of water body is issued to legal entities and sole proprietors;

For opening the procedure for issuance a permit the applicants shall submit an application form approved by the Minister of Environment and Water Supply.

*Documents required for issuing the permit:*

**1. Facility for aquaculture production**

a) The project activity/type

b) Positions for the developed project and the place of performing the activities issued by the Headquarters of the Navy of the Republic of Bulgaria and the Executive Agency "Maritime Administration" – where the activity is carried out in coastal waters or in the Danube;

c) A project for changing the use of dams – municipal property, statement for approval from the municipal expert technical council

**2. for floating facilities in dam lakes:**

a) Project for construction of the facility and its operation;

b) Coordinating opinion of the National Agency for Fisheries and Aquaculture on areas for commercial fishing and fish farming areas in large dams - where the dam is not zoned;

c) A preliminary contract for the transportation of waste water and household waste or project for wastewater treatment – in cases where these result from the activity of the floating facility;

d) A contract with a diving company for annual service of the anchoring equipment

Permit for use of a water object shall be issued for a period up to 20 years.

The administrative fee is in the amount of BGN 250-500.

To extend the permit license the applicant shall pay a fee in the amount of BGN 100.

*B) Permits for surface water supply*

Permits shall be issued upon submission of a number of documents, depending on whether it is a new construction or existing facility.

When the permit is for water supply to produce aquaculture, together with the feasibility (pre-investment) study the applicant shall also enclose a description of technology of cultivation and description of the type and purpose of the aqua farm (including fattening, growing up, etc.).

The intake facilities for surface water shall be equipped with approved under the procedure of the Measurements Act measuring devices for measuring the used water volumes.

When the measuring device is not mounted to or the mounted measuring device is not certified or it is damaged, the water supply charge is calculated based on the utilised annual amount of water and depends on the purpose of the use.

Operators should perform their own monitoring (at their expense), which shall include:

1. Observations of the quantitative status of surface waters by monthly measurement of the total and the used water volumes;

2. Sampling, to assess the quality of water used.

The administrative fee is in the amount of BGN 250-500.

To extend the permit license the applicant shall pay a fee in the amount of BGN 100.

C) Assessment on the need of EIA

The need for performing an Environmental impact assessment (EIA) of projects is assessed by the Director of the Regional .Inspectorate of Environment and Water (RIEW). He/She will take a decision within one month of submitting the request by the Applicant of the investment proposal.

Decision considering not to carry out EIA shall lose legal effect if within five years from the date of issue the implementation of the project has not started, and this is established by inspection of the control environmental authorities .

The fee to be paid is in the amount of BGN 290-700.

D) Authorizations under Article 67, paragraph 2 of the Biodiversity Act

Permits are issued for:

1. Introduction in nature, including import with such purpose, of non-domestic wildlife animal and plant species;

2. Importing for breeding and keeping of non-domestic wildlife animal and plant species in possible emerging of uncontrolled human conditions;

3. Reintroduction in the country’s nature of extinct fauna and flora native wildlife animal and plant species.

Responsible institution is the Ministry of Environment and Water. The permit shall be issued on the basis of an application submitted to the Ministry of Environment and Water.

Applicants should develop programs with duration of 10 years, except in cases for which there are approved plans of action under Chapter Two, Section VII of the Biodiversity Act.

* ***Introduction into the nature of non-domestic animal and plant species***

The written application shall contain:

1. Full name, ID number and address – for individuals;

2. Name, head office, address of management, certificate of certificate of incorporation , BULSTAT – for legal entities;

3. Subject, purpose, location of implementation and method of program funding that the person will develop.

Within 30 days of receipt of the program, the Minister of Environment shall give an opinion and in the case of a positive opinion shall start the preparation of the scientific expertise of the program;

The deadline for expert reports is not more than 30 working days. The funds for making the expert reports shall be paid by the Ministry of Environment and Water.

In case of positive conclusion of the expert report the President of the National Council on Biological Diversity (NCBD) shall submit the program for discussion at first meeting of the council. The date should be appointed by the Ministry of Environment and Water (usually within 1 month). In case of a positive decision within 15 days after approval of the protocol, the Minister of Environment and Water shall issue the applicant a permit for the activity.

The administrative fee is in the amount of BGN 500.

* ***Re- introduction into nature of domestic animal and plant species***

The applicant shall submit a written application in the Ministry of Environment and Water for performing the activities, which shall include:

1. Full name, ID number and address – for individuals

2. Name, head office, address of management, certificate of incorporation, BULSTAT – for legal entities;

To the application shall be enclosed a program for reintroduction in nature of a domestic animal or plant species.

The Minister of Environment and Waters or his/her designee within 20 days shall notify the applicant that agrees to perform a public discussion of the program.

The applicant undertakes a public consultation. The deadline for notification and free access to the program shall be at least 20 days before the public consultation.

After the public consultation, the applicant shall submit to the Ministry of Environment and Waters the program, copies of the minutes of the public consultation and report on the unreported notes and recommendations.

Within one month the program is sent for coordination to the Ministry of Agriculture and Forestry and the Ministry of Regional Development. They shall send their opinion to the Ministry Environment and Waters within one month of receiving the program.

Within 15 days after the expiration of the deadlines (a total of 2 months) the Ministry Environment and Waters shall issue the applicant a permit for the activity.

The above deadlines do not reflect the periods for reflecting notifications and supplementing the programs that are entirely dependent on the applicants.

The administrative fee is in the amount of BGN 50.

#### Ministry of Agriculture and Food, the Bulgarian Agency for Food Safety, Regional Directorates for Food Safety

##### Registration of stock-breeding projects

Owners or operators of stock-breeding holdings submit application from for registration to the Director of the Regional Directorate for Food Safety (RDFS) in concern, accompanied by:

1. Copy of document of ownership or usage permission of the site;

2. A copy of the document for commissioning the facility, in case it is required by the Spatial Planning Act

3. A copy of the contract with veterinarian for prevention, treatment and diagnostics of diseases on animals to be breed in the site;

4. Document for paid fee

Within seven days of submitting the application the Director of RDFS by order shall appoint a commission for verification the compliance of the site with veterinary and medical requirements for animal welfare.

Commission within three days shall submit to the Director of RDFS opinion with proposal for registration or rejection.

In case it was found during the verification that the site does not meet the veterinary and medical requirements, the commission shall provide a written prescription to the applicant which determines the period to correct deficiencies.

After their removal, the applicant shall inform in written the Director of the RDFS, who within 7 days shall send a commission to re-inspect the site.

Within three days of the submission of the opinion of the Director RDFS shall enter the farm in the register and shall issue a certificate of registration or reasonably shall refuse registration in case the site does not comply with the requirements.

The registration of the stock-breeding farm is unlimited.

The administrative fee is in the amount of least BGN 50-100 and it shall depend on the area of the fish-breeding farm, as for farms over 200 acres there is additional payment per acre of land.

##### Registration for performing activities in facilities for production and marketing of foods (e.g. dispatch centres for bivalve molluscs for direct consumption – Class "A", fish-processing plants, warehouses for food wholesale, retail sale of food, ships and boats – executing fisheries activities as primary production).

The registration of production site or food trade site is carried out by the Regional Directorate for Food Safety (RDFS) according the location of the site.

In order to be registered should submit an application form.

Within 10 days of submitting the application the authority in concern shall notify the applicant for deficiencies, if any, and shall set a deadline for their elimination.

Within 30 days after submitting the documents or after eliminating the deficiencies, representatives of the RDFS in concern shall make an on-the-spot check. Upon finding non-compliance with the requirements, this authority shall prescribe a recommendation and determine the appropriate period for its compliance.

Within 15 days after on the spot check, or after the compliance to the prescription activities are made to the site, a registration of the site is done, and a certificate of registration is issued. The site registration and the certificate are valid for indefinite time.

The administrative fee is average BGN 1.00 per ton and it shall depend on the volume of production/trade.

##### Registration of vehicles for the transportation of live fish

All land vehicles used for transportation as well as containers and vessels for the transportation of animals shall be approved by the Bulgarian Food Safety Agency (BFSA)), and a certificate form shall be issued for it.

The certificate of approval shall be for a period of 5 years.

Transportation of animals is performed by carriers that have received permit for transportation for short-time or long-time trips from the Bulgarian Food Safety Agency.

Carriers submit an application form to the Director of RDFS. Within three days of submitting the application the Director of RDFS shall issued a certificatory - letter form.

In order to obtain a permit for transportation should submit an application form to the Executive Director of the Bulgarian Food Safety Agency. Permit fee shall be paid at the rate of BGN 300.

Within three days of the application, the Executive Director of the Bulgarian Food Safety Agency by order shall appoint a commission to make inspection of the submitted documents and the vehicle. Within 10 days the Commission shall submit an opinion to the Executive Director of the Bulgarian Food Safety Agency with a proposal for authorization or denial. Within 20 days of submitting the application, the Executive Director of the Bulgarian Food Safety Agency shall issue a permit for the transportation of animals according the form or reasonably shall reject its issuance. The permit is valid for indefinite time.

##### Registration of Transport vehicles for food of animal origin (incl. fish)

For the registration of the transportation vehicle the owner shall submit an **application** form to the Director of the RDFS. Registration fee shall be paid in the amount of BGN 22.00.

Within 7 days of receipt of the application the director of RDFS by order shall appoint a commission that shall make inspection of submitted documents and the vehicle. The Commission shall submit an **opinion** to the Director of the RDFS with a proposal for registration or rejection of the registration of the vehicle. **Within 30 days** of submitting the application, the Director of RDFS **shall enter the vehicle in the register** and **shall issue a certificate** of registration **or** reasonably shall refuse registration. **The registration is for unlimited period of time**.

##### Other charges:

1. Fee for use of water site: The fee depends on the area that is used, the single value is 0,001 BGN per cubic meter and depends on the category of the water site, but not less than BGN 100 per year
2. Fees for sanitary control of production and marketing of food – depending on the products and their quantity – according a rate of Ministry of Agriculture and Foods.

#### Statistical information about registered operating farms for fish and other aquatic organisms

The registered farms for the fish production and other aquatic organisms according to NAFA for the period 2007 - 2013, were as follows:

* fish farms - basins: The number of active farms as of 31.12.2013 was 194; Suspended registrations were 88, 183 new registered
* fish farms - collectors: The number of active farms as of 31/12/2013 is 36, Suspended registrations were 6, 31 new registered within the period
* fish farms – pond farms (net cages): The number of active farms as of 31.12.2013 is 37; Total 33 new registered, suspended registrations - 9
* fish farms – Dam lakes: The number of active farms as of 31/12/2013 is 55, with suspended registration are 24, with new registered for the period - 2.

The average time to complete the registration procedures is about 500 days, which does not include the time for the issuance of:

* Opinion on the project and the place of performance of the activities by the Navy Training and Preparation Headquarters of Republic of Bulgaria;
* Opinion on the project and the place of performance of the activities by the Executive Agency "Maritime Administration".

There is no legal deadline for these procedures as well as fixed time to eliminate defects in the documents due for the issuance of licenses and registrations.

The total amount of administrative fees and expenses of the candidates amount to about BGN 2100, and it does not include charges for production and marketing of fish and non-fish hydrobionts, charges for sanitary control and charge for use of the water site that shall be determined individually.

## Planned actions to reduce the administrative burdens

The administrative costs and timing of procedures and administrative requirements play an important role in determining the overall competitiveness and the development of an economic sector. Undoubtedly, currently the time and costs for issuance of the permitting documents for new aquaculture farms are very large, especially when it comes to marine aquaculture. The reason is the large number of coordination procedures required by the various institutions under many regulations and the lack of coordination between them in determining the points of the aquatic environment.

In order to reduce the administrative burden, there is an urgent need to create and operate Advisory Board of experts for the development of aquaculture to the Minister of Agriculture and Food. The objective of this council will be to support policy making for the sector, and to solve specific issues related to the implementation of the national legislation and in the development of the new programming documents for the period 2014-2020.

In addition, the process will be supported, if at the initiative of the Minister of Agriculture and Food shall create an interagency working group to analyze the legislation governing the "aquaculture" sector and to develop a program of legislative changes in order to minimize the administrative burden: elimination of some of the procedures, reconciliation/parallel execution of others, etc. The objective of this process is to introduce the procedure "single administrative desk" for registration of aquaculture production and to achieve average duration of the registration process within not more than seven months (210 days). In the working group should be represented at least MAF, MEW and the Ministry of Transport, and their regional departments. The working group shall be chaired by the MAF as a state institution responsible for the development and implementation of development policy in the sector. In the process of developing the proposals for legislative changes, these should be presented and consulted at least with representatives of industry, the research institutes and organizations and NGOs, and in the best case – the general public.

**Table 10** Quantitative targets

|  |  |  |  |
| --- | --- | --- | --- |
| Target: Simplification of administrative procedures | Base value | Target value | Term to achieve the target |
| А) Reduction in the duration of the registration process | 500 days | 210 days | 2015  |
| B) Development of guidelines for the application for registration | 0 | 1 | 2014 |

# Ensuring sustainable development and growth of the aquaculture sector through coordinated spatial planning:

## Assessment of the situation at national level

*The National Development Programme Bulgaria 2020* marked the beginning of constructive inter-ministerial dialogue on the overall vision and long-term objectives of all national and sectored policies. It gives the guidelines for the strategic programming documents for the implementation of national and Community policies in the next programming period 2014-2020 that support coordination and commitment of sector policies with spatial planning and the development of a significant part of the proposals for the development of the national territory.

In connection with the implementation of EU requirements and the introduction of an integrated approach to planning and spatial development, Bulgaria has developed the National Concept of Spatial Development and the National Strategy for Regional Development, that offer the territorial basis for setting national priorities and measures to achieve balanced and sustainable development.

The specific objectives and tasks are summarized as follows:

* Achieving the objectives and tasks of spatial planning at the national level, bounded to the overall sustainable and balanced socio-economic development and resource opportunities;
* Integration of territory planning with the regional and sectored planning through regional coordination of sectored policies, strategies, plans and programs directly or indirectly related to spatial development;
* Reduction of disparities in use, incl. rebuilding the territory, without rejecting the principle of the regional policy to concentrate and create optimal conditions for sustainability and planning in the spatial development;
* Creating a territorial basis to stimulate the polycentric development of the network of cities and improving the effectiveness of the links between central and peripheral regions, between cities and their surrounding rural areas;
* Definition and identification of areas with specific territorial characteristics based on appropriate methodology and system of indicators, and identification of functional areas with important national and regional significance, requiring implementation of specific policies for development;
* Formulation of guidelines and principles for the implementation of the policy on spatial planning based on the structure of territory of the country for a definite period of time;
* Defining the tools for the implementation of a real and active coordination between the various hierarchical levels of spatial planning and the interventions of the Operational Programmes 2014-2020.

Key instrument for the effective implementation of spatial planning is the ***Geographic Information System*** with the proposed structured base of geospatial data. This instrument facilitates the process of decision making through additional GIS-based analysis on the structuring and organization of national space.

The spatial model is built on the generalized conclusions that specify the priorities set out in it:

* One of the most serious problems the country will face in the coming decades will be the demographic crisis in its many manifestations.
* The targeted support for rural areas with the potential for both development of traditional industries and the diversification of economic activities is based on the specific characteristics of the areas and the integration of resources of the natural, cultural and social values.
* The important related areas of transport infrastructure that as elements of European communication and transport network will be carried out with priority, must be bounded to the infrastructural corridors with concentration of important engineering and technical infrastructure.
* The principles of concentration of resources and for directing integrated investment should apply to all topics, so that shall also outline the areas saturated with cultural valuables in addition to the areas with a concentration of important elements of the European ecological network.

One of the strategic objectives of the country is integrated planning and promoted development of areas with specific characteristics (coastal Black Sea, Danube coastal, mountainous border and peripheral areas) in order to preserve and effectively use their natural, economic, social and cultural potential for development.

To achieve this objective it is necessary:

* Integrated management and sustainable development of the Black Sea coast and the Black Sea municipalities ;
* Involvement of the Bulgarian Danube municipalities and regions in the pan-European Danube region and development of cross-border partnerships and Euro-regions for integrated management. Support for mountain border areas;
* Implementation of the European Green Belt Initiative for sustainable development and conservation of nature in the mountainous border areas;
* Recovery of damaged areas, the ecological balance and biodiversity, adaptation to climate change and mitigation of natural disasters.
* Promoting the social cohesion.

Spatial planning is a process that should be integrated into the key sectored strategies with spatial dimensions, and in addition should:

* Embed the spatial aspects, principles and limitations in conformity with the sectored policies and programs in concern;
* Regulate the clear obligations and responsibilities to support and implement the provisions of spatial planning at all levels.

## Future measures to promote the spatial planning:

In particular, for the “Aquaculture” Sector, MAF – regarding the authority responsible for implementation of the policy in the sector – is responsible for the integration of measures and activities related to the development of aquaculture in the development plans at different levels:

* Regional Level Planning
* Level NUTS3
* Local strategies for development at the level of Fishery Areas

This can be done within the process of development of plans – through direct involvement with own representatives and/or in the process of coordinating the plans.

On its turn Ministry of Agriculture and Forestry will support the planning processes by initiating an analysis of the potential for development of aquaculture the water sites in the country as well as in the Black Sea aquatory. A map with designated areas for the aquaculture will be designed and published, which will support the development of regional development plans in their “aquaculture” part. During the mapping will also be included other authorities such as MPP and MEW, which on their turn will assist with the available information databases.

In areas with established or predicted water stress (drought or water shortages), set by MEW Basin Directorates, will only support activities aimed at water saving technologies, recirculation of waste water and treated wastewater, reconstructions and modernizations of production technologies to reduce discharges, outflow and losses of priority substances.

The definition of water-saving technologies will be determined within the Advisory Board of the Ministers of Agriculture and Food, which in their turn will guarantee that in the inter-agency coordination of the areas with established or predicted water stress will not be affected extensive and semi-intensive farms.

It is recommended that in determining the areas shall attract also researchers from fisheries sector and aquaculture.

A new set up instrument for the citizen participation at local level in developing of solutions to the social, ecological and economic challenges we face today is the initiative Community-led local development (CLLD).

CLLD initiative should be implemented " bottom-up " so that local communities and in particular representatives of the fisheries sector to participate in the formulation , selection and approval of priorities and strategy for integrated development of the territory and communities. It should be aimed at sustainable development of areas for aquaculture and commercial coastal and freshwater fishing .

During the programming period 2007-2013 Bulgaria was applying for the first time support for the local development from the European Fisheries Fund. There are created and operate six Fisheries Local Action Groups, covering the territories of 17 municipalities . In the scope of these FLAG are over 4053 sq. km. and a population of over 104,467 people. Based on lessons learned during the 2007-2013 programming period, must be taken steps to upgrade existing capacity and to raise awareness of the fishing community in fishing areas.

CLLD should be administered on a territorial basis - at the municipal level or within the group of neighbouring municipalities, such as the scale of the population should be between 10 000 and 150 000 inhabitants.

The main challenges to be met by implementing community-led local development in the programming period 2014-2020 will concern the need for creation of employment (including alternative ) and use of local potential for growth, and should aims to improve quality of life and incomes of local people .

For areas with specific characteristics in the 2014-2020 programming period, the instrument CLLD will be applied by multi-funds financing. Areas with specific characteristics are defined in the National Spatial Development Concept - Black Sea and Danube coast, mountainous , border and rural areas, areas at risk and areas for the protection of the landscape , natural and cultural values. The common characteristic of these areas is the progressive reduction of the population and the untapped economic potential of the area.

So fishing communities in these areas will have a real opportunity to take advantage of new opportunities for the preparation and implementation of integrated multi-sectoral and multi-fond strategies by which to be ensured complementarity and synergy in the projects considered to the specific needs of the respective areas. Depending on the needs and potential of the particular area local groups will motivate the need for funding the strategy by one or more ESIF.

**Table 11** Development Targets

|  |  |  |  |
| --- | --- | --- | --- |
| Target: Ensuring sustainable development and growth of the sector through a coordinated spatial planning | Base value | Target value | Term to achieve the target |
| A) Preparation and publication of a map and database for areas with sufficient capacity and potential for aquaculture development | 0 | 1 | 2017 |
| B) formation of fishery areas on the territory of Bulgaria based on the importance of aquaculture | 0 | 6 pcs | 2015 |
| C) Integration of measures for the development of the sector in the Regional Development Plans | 0 | 6 | 2013 |

# Improving the competitiveness of the aquaculture sector

# 5.1 Assessment of the situation at national level

At national level, competitiveness is defined as the set of policies and other factors that determine the level of productivity of the country.

Competitiveness is fundamental complex indicator. It is a concentrated expression of the economic health of any country and summarizes the efficiency of the functioning of its economic, social, financial, institutional and other subsystems. Competitiveness of the economy shows the potential to increase overall national productivity and quality, and to compete with other economies of the regional and global market.

Competitiveness has many dimensions: the potential for intense sustainable growth with the inherent three pillars – economic, social and ecological; productivity of the factors of production, factor cost per unit of finished product, quality (technical level) of the products, product and services reliability, structural characteristics of the economy in the broadest sense, imitation and innovation potential of the economy, a strong sensitivity to market signals and vast response, potential for rapid absorption, distribution and commercialization of technical and other innovations, loyal partnership in the economic relations; combination of private, state and public interests.

The application of a strong program to boost the competitiveness depends heavily on support from the highest levels of political government. The program for development of the competitiveness of the aquaculture sector should provide a clear diagnosis of the problems facing the sector and compelling vision that is recognized (or accepted) by a wide range of participants who are willing to seek change and to implement a oriented growth strategy. Programs that support the relationship between private business, science and education, civil society organizations, government and political leaders could better identify barriers to competitiveness; these can develop joint solutions on strategic policies and investments and obtain better results in the implementation.

The European Union countries, including Bulgaria, rely on scientific studies related to the production and technological development, by allocating significant amounts for projects to improve the country's competitiveness. The way to improve competitiveness is to invest in education, research, innovation and technological infrastructures.

Companies and aquaculture vehicles in Bulgaria face different challenges and opportunities. It is necessary to propose solutions that are tailor-made, but everyone in the industry will benefit from a better market organization and structure of the organizations-producers of aquaculture products. These objectives are also a priority for the reform of the Common Market Organisation (CMO) and for the new European Maritime and Fisheries Fund (EMFF), which allows financing of projects with similar goals by the new program. The plans for production and marketing can direct operators to identify business opportunities and to adapt their marketing strategies accordingly.

Growing consumer expectations for quality and variety of food products, especially those produced locally, offer new opportunities for giving value to coastal and inland areas. The coordinated local actions between entrepreneurs, public authorities, associations, research institutions and organizations for education and training can help to stimulate local economies and meet the growing demand for fish and fish products, produced locally in a sustainable way.

Trade diversification can provide additional sources of income to producers. For example, the integration of fisheries and tourism and the internationalization of certain activities upwards and downwards the chain can provide new business opportunities for farmers in aquaculture.

The development and diversification of business activities can be also promoted by means of market-oriented research, innovation and knowledge transfer. For this purpose should strengthen synergies between the national research programs and to encourage the participation of enterprises in research and innovations, including in particular implementing the Strategic Plan for Research of the European Platform for Technology and Innovation about European aquaculture and strategy for "Blue growth".

Aquaculture production provides opportunities for biodiversity conservation by reducing fishing pressure on wild populations’ hydrobionts. The effects of the various measures to be applied in areas rich in biodiversity such as the areas of "Natura 2000" and lost profits resulting from the protected predators such as cormorants and otters for example, as well as the voluntary commitments to biodiversity conservation or water, are already recognized and producers can be encouraged by compensating for suffered losses.

Bulgaria should take full advantage of the proposed by EMFF support for the economic growth through appropriate allocation for aquaculture, including plans for production and marketing and to improve the relationship between R & D and industry (especially small and medium-sized enterprises). To achieve this, should do the following, namely:

* To support educational and professional programs designed to meet the needs of the aquaculture sector;
* To encourage research and innovation in the field of aquaculture and their transfer in the real economy;
* To encourage the transfer of knowledge, best practices and innovation, including the results of research projects of the EU;
* To establish a mechanism for market research and to provide current and useful information on trends and changes at national and European level.

### Aquaculture – Summary of SWOT Analysis

**Table 12**

|  |  |  |  |
| --- | --- | --- | --- |
| **STRENGTHS** | **WEAKNESSES** | **OPPORTUNITIES** | **THREATS** |
| 1. Long tradition in the sector under different types of cultivation;
2. Favourable natural climatic and hydrological conditions for the development of the sector;
3. Increasing the demand for fish in the domestic and foreign market and a negative trade balance in the European market (EU – 27);
4. Picturesque landscape around the farm – a prerequisite to diversify the activities by developing tourism;
5. Production of high-quality protein product of a primary need – food,, which always will be under consumer demand.
 | 1. The sector is not sufficiently competitive in the world market;
2. Insufficient interaction between the research sector and the business;
3. Relatively less consumption of fish and hydrobionts in the domestic market and not enough effective promotion of aquaculture products;
4. Lack of concerted actions between the branch organizations to promote Bulgarian companies in the international markets and to identify market niches;
5. Underdeveloped direct selling "from the farm."
 | 1. Improve the transparency and effectiveness of the procedures for issuing permits;
2. Introduction of sustainable innovative and promising practices and technologies in aquaculture;
3. Enhancing the professional skills of those employed in the aquaculture sector through lifelong learning and the introduction of know-how;
4. Financing the sector with funds from the European Fisheries and Maritime Fund, futures and forward contracts with established market structure, co-financing of the insurance premium and financial engineering ;
5. Diversification of production through cultivation of species of higher price segment, export oriented and having potential for industrial processing and development of tourism;
6. Increasing the added value of the production from aquaculture by implementing activities in primary processing and marketing;
7. Participation in international exhibitions;
8. Improving cooperation through the branch structures, associations and producer organizations in developing national policies , pricing, and marketing infrastructure.
9. Effective promotion of local products in the domestic and international market.
 | 1. Continuation of the economic recession in the country and worldwide ;
2. Systematic or impact water pollution;
3. Global climatic processes leading to drought, which can result in a shortage of quality water for aquaculture;
4. Increased competition in the Common European market (EU-27), Norway, and Iceland, and especially imports of fish, non-fish hydrobionts and their products from the lower price segment from Indonesia, Vietnam, China, Chile, etc.;
5. Changing consumer preferences towards other products;
6. Conflicts between different users of water resources (electricity, irrigation, drinking water , fishery).
7. Spread of diseasse in imported figerling and ineffective control on the introduced hydrobionts .
 |

Aquaculture is a highly multi-disciplinary activity that combines aspects of biology, engineering, economics and management. Each of these areas is actively involved, especially in the case of introduction of new technologies or existing establishment in a new environment.

## Research and educational centers

The research and education centers in the country relating to aquaculture activities are as follows:

* **Department "General and Applied Hydrobiology" at the Faculty of Biology, Sofia University "St. Kliment Ohridski"** is the oldest educational unit, connecting their business with education in the field of aquaculture. The Department is accredited to train students in bachelor's , master's and doctoral degrees in the following fields: (1) Hydrobiology, (2) Ichthyology and Aquaculture, (3) Biological Water Treatment. These activities it carried out simultaneously and in cooperation with Bulgarian and international research units and institutes. The department maintains close ties with state, cooperative and municipal entities, private companies in the country and abroad, whose object of activity is preservation and management of natural waters, construction and operation of treatment facilities of various types, advanced technologies for the development of aquaculture. The department maintains traditional excellent and mutually beneficial contacts with leading universities from Poland, Belgium, Germany, France, Turkey, Macedonia, etc., both within the Erasmus Program and other scientific and educational programs.
* **Institute of Fisheries and Aquaculture to Agricultural Academy of Bulgaria (IFA)** – leading research body in Bulgaria serving the industry. The Institute was established more than 60 years ago and throughout its whole history has performed research, application and service activities in the field of fish farming in the country. Aquaculture development in Bulgaria is related to the work of scientists from the institute, which underlie the development and deployment of various technologies, introduction of new species, development of a wide range of applications related to cultivation, raising, prevention and treatment of diseases. Currently, the institute is working on number of projects related to the strategic directions of world aquaculture. IFA works closely with the business, industry organizations, BAS and universities from our country and abroad. The scientistsfrom IFA – Plovdiv are leading lecturers in various disciplines related to fisheries and aquaculture in the Agrarian University – Plovdiv and Trakia University – Stara Zagora.
* **Institute of Oceanology, Bulgarian Academy of Sciences, Section "Biology and Ecology of the Sea".** The institute studies the taxonomic and functional biodiversity of the Black Sea ecosystem and trophic interactions, examines changes in biota due to external factors – the anthropogenic pressure and global climate changes, develops methodological guidelines for monitoring and laboratory analysis of the Black Sea flora and fauna and classification systems for the biological quality elements in the implementation of the Water Framework Directive 2000/ES/60 in Bulgaria, performs evaluations of the ecological status of waters and stocks intensively exploited fish species along the Bulgarian coast and adjacent water areas, develops science-based criteria for the sustainable development of ecosystems and biological resources with a modern laboratory for molecular taxonomy and ecology of marine organisms that performs genetic analysis for studying the population genetic structure of marine aquatic organisms.
* **Institute of Fishery Resources at the Agricultural Academy of Bulgaria** is a state research Institute, founded in 1932. Since the early 50s of last century IFR is the only Institute that performs regular tests in the Bulgarian territorial waters. Currently it holds a collection of data collected over many years and allowing to draw conclusions about the major changes of the Black Sea ecosystem over a long period of time. Since 2007 by Ministerial Decree IFR recovered their independence.
* **Department "Biology and Aquaculture" at the Faculty of Agriculture of the Trakiya University.** In Section Aquaculture to the Department are working in the following directions: development of intensive cultivation technologies for aquatic organisms, analysis of the financial management of fish-farms, environmental assessment of the aqua-farms, market information and reduction of price risk in the aqua-production, economic analyzes of the fish-farms; environmental assessment of the fish-farms and organic aquaculture. In the major subject 'Veterinary Medicine' students study and the discipline "Biology and diseases on hydrobionts."
* **Department "Animal Science" at the Agrarian University - Plovdiv.** The Department prepares bachelors and masters – zoo engineers who are trained in the disciplines “Fishery” and "Technology for the production of quality and safe food in aquaculture." The major “Agro-forestry Systems and Mountain Farming” students also learn the discipline "Fisheries".
* **Institute of Biodiversity and Ecosystem Research, BAS**, conducts significant research in the field of theoretical and applied aspects of ecology, biodiversity, environmental protection and sustainable use of biological resources. Priority areas are: Structure and function of biotic communities, ecosystems and landscapes; Variety of organisms and their ecological relationship; Scientific basis for the conservation of living nature - revealing threats and development of methods for their elimination or restriction; Approaches and methods for sustainable management of the biological resources; Ecology and biology of economically and socially important species, limiting the impact and regulation of the number of species – invaders and other organisms of importance to environmental protection, agriculture, fisheries and other areas of human activity; Scientific basis for assessment of the ecological risk, environmental quality and impacts on it, etc.
* **National Reference Laboratory for diseases on fishes, marine molluscs and crustaceans (NRL) to the National Diagnostic Research Veterinary-Medical Institute** is a specialized structure within the Bulgarian Agency for Food Safety . It carries out research, laboratory diagnostics and reference expert activity in the field of health aquaculture. In accordance with the European Directive 2006/88/ES for the health requirements in aquacultures and products thereof, and on the prevention and control of certain diseases in aquatic animals it perform the Surveillance programs for economically important exotic and non-exotic diseases in fish farms. The official laboratory control for health status and health surveillance is based on modern virulogic, bacteriological and molecular biological diagnostic methods accredited according ISO 17025/2006. It develops science-based criteria for the categorization of the fish-farms depending on their health status and based on risk analysis of surveillance. The laboratory participates in testing new drugs, development and administration of vaccines and complex schemes for medical treatment. It performs specialized consultancy services and scientific – methodological assistance to fish producers in the country. For prevention and therapy of various diseases in the development of veterinary and sanitary events as an indispensable element of technological programs, the laboratory prepares expert assessments and comments on the draft regulations and participates in training programs. NRL maintains fruitful contacts with European reference laboratories for diseases on fishes, marine molluscs and crustaceans, and participates in annual meetings and seminars where are discussed current issues in the field of health of aquaculture and the application of the regulations in this area, as well as in the organized by the Laboratory inter-laboratory tests of competence.
* **National Museum of Natural History to the Bulgarian Academy of Science, Sofia,** is research institute and the richest Museum of Natural History on the Balkan Peninsula.

It preserves and promotes the animate and inanimate nature in Bulgaria and abroad – over 1 million representatives of taxidermy animals, and plants and minerals. The exposures of the National Natural History Museum comprise more than 400 species of mammals, over 1200 species of birds, numerous amphibians and reptiles, hundreds of thousands of insects and other invertebrates, and fossils (bones, bone fragments and whole skeletons). Also here there are many minerals and about 1200 species herbarium specimens of the flora of in Bulgaria. The National Museum of Natural History was the first and richest museum of natural history on the Balkan peninsula. Besides the specialized museum activities related to enrichment and maintenance of collections, the research work of the collaborators is associated with the current international and national priorities in the field of the study of biodiversity, geology, ecology and environmental protection. Since 1989 the museum has printed the magazine "Historia naturalis bulgarica". The National Museum of Natural History is a center of the non-governmental organizations: the Bulgarian Ornithological Society and the Group for Research and Protection of bats. The museum presents ichthyo-fauna and all amphibian species in Bulgaria. The exhibition includes all the major genuses and species of fish inhabiting our fresh water. A Diorama presents life in the coral reefs of the Caribbean Sea.

* **Plovdiv University** is a leading cultural, educational and scientific institution. The Plovdiv University is the second largest classical university in the country after Sofia University "St. Kliment Ohridski". Today Plovdiv University "Paisiy Hilendarski" has nine faculties, where educate more than 8,000 full-time and 5,000 part-time students in more than 40 specialties in natural, human, social and economic sciences. In the cities of Smolyan and Kardzhali there are affiliates of the University and a College in Smolyan. The Plovdiv University has a library, university publishing house, university information center, specialized laboratories, language studies, multimedia and computer labs, distance learning center, center for career guidance, research division, sports center, theatre school, university koradio, technical centers, and service units. The University maintains active international contacts with almost all European countries, the USA and the countries of Asia and Africa. It participates independently or jointly with other European universities in EU programs in the U.S. and Swiss funds for research. The academic community develops also relationships with universities in Europe, Russia and the Middle East.

### Measures to support innovation and the links between R & D and industry

Main tasks of the training centers, but also to those employed in the aquaculture sector are:

* Increasing the qualification and updating the skills of a wide range of people involved in aquaculture production, including "lifelong learning";
* Synchronizing the needs of aquaculture operators and educational trainees in the universities;

In order to stimulate also innovation in aquaculture, the structural measures will support projects aimed at:

* development of technical innovation or knowledge in the field of aquaculture, leading in particular to the reduction of environmental impact, promoting more sustainable use of resources, improve animal welfare, facilitating new sustainable production methods;
* development and market introduction of new or significantly improved products, new types of aquatic organisms with good market potential, new or improved processes, new or improved management systems and organization;
* study of the technical and economic feasibility of innovations, products or processes.

Good aquaculture practices are a set of generally accepted standards in the field of the production of fish and other aquatic organisms that should be developed at national level. These standards are aimed at the technological processes, environmental protection and human health, animal welfare, food safety and traceability of production. They are usually organized as a differing system for ranking economic units in the field of aquaculture production and product processing in the sector.

In Bulgaria there are no such approved and adopted national standards. There are developments of IFA – Plovdiv, which can be used as a basis for development and implementation of the so-called good aquaculture practices at the national level. In this connection should meet certain procedural steps:

* Development of good aquaculture practices
* Wide consultation and approval of the standards
* Nomination of laboratory centers for control on their applying and their accreditation (if necessary).

In order to ensure the technical feasibility and viability of the project proposals, before approving should be carried out a technical assessment of the project by experts in the field in concern.

### Other measures:

In addition to creating the conditions for *sustainable growth* of the aquaculture sector will support the following activities:

* Supporting farms to promote the voluntary insurance of products from farms against adverse weather conditions. This support will help micro-, small- and medium-sized enterprises in the sector to gain predictability of their production and will support the budgets of this type of farms , which are often familytype;
* Promoting the human capital through lifelong learning, dissemination of scientific and technical knowledge and innovative practices and the acquisition of new professional skills in the field of aquaculture;
* Development and implementation of measures from the financial engineering; In this connection should also be organized specialized trainings for the users of the tools (the operators in the sector);
* Given the age structure of farm operators is appropriate to promote the entry of young investors in the sector to preserve the aquaculture traditions and to recognize the production as a profitable endeavor;
* Supporting the establishment of centers for primary processing of production, dispatch centers, cleaning and purification and relaying centers.

As the market for aquaculture products is not yet well structured and transparent, should have an integrated approach to the implementation of measures related to marketing. It is appropriate to support the following activities associated with the increase of export potential of products:

* Promoting the production of aquaculture products obtained using methods with low impact on the environment and organic aquaculture ;
* To contribute to the transparency of production and markets, conducting market research;
* Contributing to the traceability of aquaculture and its products ;
* Conducting regional, national or transnational advertising campaigns for fish and other aquatic organisms, as well as information campaigns to raise public awareness of fisheries sector and aquaculture.

**Competitiveness** of the farms will be achieved by conducting many activities designed to increase their production capacity, improving the quality and reliability of products, implementation and dissemination of innovation, etc. The objective is to create an industry that will make any economies of scale in production and reducing the cost of production. Increasing the production capacity will be performed as along with the traditional forms of breeding fish and other aquatic organisms, will also introduce intensive and super-intensive innovative technologies. An important result of the development of the aquaculture industry will be to create a resource base available for the processing industry and the traders along the chain producer – consumer.

# Promoting equal conditions for the operators using their competitive advantages

Competitiveness and public acceptance of the aquaculture sector and its products is directly dependence on the level of sustainability of the quality of the products produced from the aquaculture and their appropriate representation to the public. This is the reason to impose increasingly still higher standards of consumer protection, both in the field of environmental protection and animal health. And this is one of the main competitive advantages of the aquaculture sector and this advantage should be used in maximum and more effectively, so that the products of the sector to be competitive in the domestic and international markets.

The society requires from the manufacturers and importers to guarantee a high level of food safety and compliance with high environmental and social sustainability criteria. This will helped by the new labelling provisions (Regulation (EC) № 1234/2007 of 22 October 2007 establishing a common organization of the agricultural markets and referring the specific provisions for certain agricultural products, General Regulation of Common Market Organization, Regulation (EC) № 104/2000 of 17 December 1999 on the common organization of the markets in fishery and aquaculture products), and the various certification schemes.

The experience in the agricultural sector confirms that there is an increasing demand and growth of retail sales of organic food. According to FAO, the production of organic aquaculture products in Europe has increased by nearly 30% per year between 1998 and 2007.

For the last 10 years the global market for organic products is estimated at $ 60 billion. However Bulgaria is far from these figures. Despite the favourable conditions of our country and the traditions in agriculture, most organic food in shops are imported from abroad. Some retailers play an important role in providing the market with certified fishery and other aquatic species which is part of their overall commitment to corporate social responsibility. The inclusion of large retailers, however, is one of the decisive factors that led to the rapid growth of the organic food sector in the last decade.

In most cases, a large percentage of demand can not be satisfied because the manufactured products have small volume, and it is fragmented and unable to form a single unit.

In our country the consumption of organic products amounted to only € 0.1per capita per year. In comparison, the consumption in Austria is for EUR 89.

**If a strategy for the development of organic production would be developed, we could quickly reach the European average in 2020.** This strategy should include integrated and horizontal measures, for many of the sectored strategies that are already projected or in stage of execution as of the time of the creation of this document.

In order to ensure high quality and mostly fresh local products may also help the development of short supply chains for the food, and this will give added value to closeness.

On the other hand it should be noted that still there is not enough advertising and promotion of Bulgarian products from the sector, both domestically and at the international market.

The main activities related to improving the image of the products of the aquaculture sector for the period 2014 2020 are the following:

* Annual participation of the Bulgarian business in SEA FOOD EXPO in Belgium by developing national Bulgarian stand for the operators in the sector;
* National Campaign and mediation aimed at resolving the conflict between the fishery community and marine aquaculture producers;
* Elaboration of best practices in aquaculture together with the operators in the sector;
* Development the production of organic aquaculture products and participation in aqua-environmental measures.

Essential for achieving this goal is the equal access of the operators to information. Publicity in determining and providing aquaculture zones remains the leading for the operators. Such a map will be made in consultation with all stakeholders and will be available online on the website of the agency. Coordinated spatial planning in determining these zones, combined with the control measures to ensure equal conditions for operators, will also contribute to enhancing the competitiveness of the industry. The measures should also support the development of producer organizations and inter-branch organizations, including at international level. This would facilitate the collective management and/or self-regulatory initiatives between producers, processors and retailers in cooperation with the consumer associations and NGOs. The requirements and the labelling and traceability regulations also will be supported, implemented and controlled.

Preparation of good aquaculture practices together with operators in the sector: The practices can be also developed as branch standards, but the main emphasis should be directed at the control of their implementation. It is needed a certification body which annually shall establish the appliance of the practices on the ground of research in accredited laboratories, as well as performing checks at the site.

Other measures are:

* To support the development of producer organizations and inter-branch organizations. This would facilitate the collective management and/or self-regulatory initiatives between producers, processors and retailers in cooperation with consumer associations and NGOs, as appropriate.
* To improve the transparency of markets and to distributes market information on trends in local, European and international level .
* To look for opportunities to support structuring the production and marketing of aquaculture products, including certification and labeling and traceability.
* To facilitate the self-regulatory initiatives and to facilitate their communication to the customers.

# Management and Partnership

There are **two main mechanisms for the implementation of the partnership principle**:

1. Direct participation in the elaboration process and decision-making;

2. Indirect introduction of a large number of social and economic partners through awareness campaign.

In this sense, the opportunities arising from this requirement create comprehensive formal and informal **instruments** available to the NGOs in their capacity as partners in the preparation, execution and implementation of strategic documents and plans.

By Decision № 328 of the Council of Ministers of April 25, 2012 for approving the list of thematic objectives to be included in the Partnership Agreement of Republic of Bulgaria for the programming period 2014-2020, list of programs and leading institution for the development of each program, NAFA was designated as a leading agency for the preparation of Programs for Maritime and Fisheries (2014-2020).

In compliance with Article 5 of Decree № 5 of the Council of Ministers of January 18, 2012 for the development of strategic and program documents of Republic of Bulgaria to manage the funds under the Common Strategic Framework of the European Union for the programming period 2014-2020, by Order № RD 1054/02.10.2012 was formed Thematic Working Group (TWG) for development of a programs for of Programs for Maritime and Fisheries (2014-2020).

The following organizations are represented in the group:

* National Agency for Fisheries and Aquaculture – Chairman
* Council of Ministers
* Executive Agency Audit of EU Funds
* Ministry of Finance
* Ministry of Agriculture and Food
* Bulgarian Agency for Food Safety
* State Fund Agriculture
* Ministry of Environment and Water
* National Office for Nature Protection
* Ministry of Economy, Energy and Tourism
* Ministry of Transport, Information Technologies and Communications
* Ministry of Regional Development and Public Works
* Representatives of the Regional Development Councils of the planning regions
* Representatives of established Fisheries Local Action Groups
* Bulgarian Chamber of Commerce
* Association of Industrial Capital in Bulgaria
* Confederation of Employers and Industrialists in Bulgaria (CEIB)
* Confederation of Labour "Podkrepa"
* National Statistical Institute
* Institute of Fisheries-Varna
* Bulgarian Industrial Association
* Coalition for Sustainable Development
* Association "Europe and us"
* Bulgarian Society for Protection of Birds
* Association "Eco Forum for Sustainable Development"
* Association "Black Sea Institute"
* Association of fishery products producers BG FISH
* naRiba-BG
* National Association of fish producers (HAFP)
* Association "Black Sea Sunrise"
* National Diagnostic and Research Veterinary Medical Institute,
* Institute of Fisheries and Aquaculture – Plovdiv
* Currently established and functioning until the Fisheries Local Initiative Fisheries Groups (LIFG)

NAFA will continue discussions within the thematic working group of the Programme for Maritime Affairs and Fisheries (2014-2020) and other programs and strategic documents concerning the development of the Fisheries and Aquaculture Sector and will address specific topics and case studies within the established sub-groups.

## Relationship with the priorities of the OP for the EMFF and distribution of funds

By obtaining full membership in the European Union in 2007, Bulgarian "Fisheries" Sector entered in a single market with Member States which apply the Common Fisheries Policy. Aquaculture is present as a measure directed to overcome the scarcity of fish in the world and to compensate for dwindling stocks and reduced fishing effort.

For the aquaculture sector, the structural support of the EU consists in co-financing of the capital costs for construction and reconstruction of farms, as well as by funding social and environmental measures in order to achieve sustainability in aquaculture farms.

For the Bulgarian producers entering this long-term subsidized sector was accompanied by numerous efforts to adapt their production facilities to increase the production capacity and lower the manufacturing cost of the production. Partly, the transition of Bulgarian producers to the unified market was softened by the implementation of pre-accession program SAPARD (2000-2006) and the current operating European Fisheries Fund 2007-2013.

Funding for the "Fisheries" Sector in the pre-accession period (2000-2006) through the SAPARD program of the European Union amounted to € 12 million. These funds have been designated for the fisheries sector in order to meet EU requirements in the field of sanitary and hygienic conditions and safety of labour and food. Fourteen processing plants and 26 aquaculture farms have signed contracts for the whole programming period. Given the scarce resources of the program, the effect of its application to the sector is strongly felt in businesses related to fish processing, while in the aquaculture the number of enterprises receiving support was under 10 %.

The implementation of operational program for the development of Sector "Fisheries 2007-2013" provides extensive support to the development of aquaculture. It provides a rapid influx of investment in the sector. The scope of the project funding is heterogeneous. Funded projects are both marine and freshwater aquaculture, implemented by various technologies, and these are supported as being traditional for cultivation in Bulgaria fish species. The executed projects under measure 3.4 "Promotional campaigns" aimed at increasing the domestic consumption of fish and non-fish water organisms in the country, but according to the industry organizations, they have not achieved the required effect.

For the absorption of submitted by the EU funding for fisheries sector and aquaculture is developed the Program for Maritime and Fisheries, which receives funding under the EMFF.

In light of the Overall strategic framework, the new elements of the Commission proposal for the European Maritime and Fisheries Fund (EMFF) can be summarized as follows:

* Most of the current financial instruments under the European Fisheries Fund (EFF) and the Integrated Maritime Policy (IMP) **are united into one fund – the EMFF**, with the exception of Sustainable Fisheries Agreements (SDS) and the obligatory participation of the Regional fisheries management organizations (RFMOs );
* **A clear policy framework** for the EMFF based on the determination of the five priorities of the Union, detailed in a set of specific objectives and measures;
* **Increased orientation to achieving results** for the EMFF;
* **Establishment of three comrehensive objectives** that hae priority on the political agenda of the Union (relating the innovations, preservation of environment, reduction of the impact and adaptation to climate change) that should be followed horizontally in the programs of EMFF;
* **Greater flexibility** in terms of measures under EMFF under the operational programs. These measures are not strongly connected to specific "priority areas" and can be programmed on several Union priorities in a flexible way according to their anticipated contribution to these priorities of the Union.
* **EMFF** will be a key tool that will assist in the implementation of the **IMP and the Common Fisheries Policy (CFP)**.

In the new programming period the EU priorities in fisheries and aquaculture are: Promotion of sustainable and characterized by resource efficient fisheries and aquaculture, including associated with them processing; Stimulation of innovative, competitive and knowledge based fisheries and aquaculture, including associated with them processing; Stimulating the implementation of the Common Fisheries Policy; Increasing employment and territorial cohesion; and Strengthening the implementation of the Integrated Maritime Policy.

For activities related to the development of the aquaculture sector in Bulgaria, which are inherent and necessary to implement, but could not be financed by the EU fund, will search for the support of the state budget and (if needed) loan funds from International financial sources.

# Good Practices

## Company for fish-farming in circulating waters in Banya Village, Panagiurishte Municipality

In 2013, in Banya Vilage, Panagiurishte Municipality, with the financial support of OP Development of Fisheries Sector was built a farm for intensive aquaculture on recirculation principle owned "Elmet" EOOD. The production program provides to produce 300 tons per year of African catfish, and the purchase price is BGN 5000 per tonne. With the implementation of the project were created four jobs.

A modern technology for intensive fish farming was selected based on the advantages it offers:

* This fish is not a pretentious one and has good market prospects;
* A practical approach to control the environmental factors for good yields;
* Sustainable yield each year;
* Minimum probability of fish contamination with external diseases.

## Installation, bio-machinery and complete biotechnology for mussels cultivation (*Mutilus galloprovincialis*) at the Bulgarian Black Sea coast

The enterprise was developed with financial support under SAPARD Programme. The investment is in the amount of over BGN 2 million. The installation, bio-machinery and complete biotechnology for cultivation of mussels at the Bulgarian Black Sea coast is developed by "Black Sea Shells" OOD with the help of world leading companies such as Noel McGreal, Danny McNulty, Murlow Bay Mussels Ltd. etc. Preliminary tests were carried out in the region of Kavarna and in the Ireland open sea. The experimental long lines withstand 9 grades waves and wind speed 130 km/h, and under such conditions the harvest of shellfish is preserved. This provides greater security to maintain the production. Buoys for this experimental line were specially designed and developed by JFC. With the realized in 2010 project under OP of Fisheries Sector Development was done modernization and expansion of the farm near the town of Kavarna. The planned production program is 810 tons annual production of mussels, and the estimated selling price per ton is BGN 880.12.

A third stage is under construction with financial support OPFSD and the realization of two more stages is forthcoming in order to expand the production capacity of the farm and to reach production quantity for the market over 3500 tons per year.

## Sturgeon farm in Bolyartsi Village, Plovdiv Region

Fish Farm "Esetra Commerce" EOOD is located in Bolyartsi Village, Plovdiv Region, at 160 km east of Sofia. The farm through the effective machinery available is performing the reproduction of following sturgeon fishes:

* *Acipenser gueldenstaedti* – Russian sturgeon;
* *Acipenser ruthenus* – Sterlet;
* *Acipenser baeri* – Siberian sturgeon;
* *Acipenser naccarii* – Adriatic sturgeon;
* *Acipenser stellatus* – Stellate sturgeon;
* *Huso Huso* – Beluga sturgeon;
* Hybrids – *Acipenser gueldenstaedti* X *Acipenser baeri*.

"Esetra Commerce" is a farm specializes in several directions, and one of them is the production of fingerling of the mentioned sturgeon species and another is the production of caviar, and it is the primary objective of the company. It also produces fish for consumption. The technological processes are as follows:

* After assessment of the sex, males are separated for production of fish for consumption, and females undergo bonification and specialized exterior selection. The successfully selected fishes, grown to 10 years of age to produce caviar.

The farm has the following categories of pools:

* In a closed hall with adjustable temperature, humidity and ventilation – there are 3 pools of 60 m2 each. The pools have independent water supply and different displacement. They are used for several purposes, namely for the production of the fingerling that comes from fish incubator to over 5 g. In the pools the sturgeon species are kept until reaching 50-200 g, and then transferred to pond fish farm in Kardzhali dam for growing up, sex bonification, sex assessment and subsequent exterior selection. The primary exterior selection is also done both in the fish-incubator and in the resettlement pools. Feeding the breeding is done with extruded pelleted fodder. The capacity of the farm for preparation, processing and preparation of caviar is 10 000 kg. per year;
* In the fish-incubator there are over 60 bath-tubs that vary in size and depth, and all are connected to a water system type half open recirculating system equipped with suitable mechanical and biological filters for water purification. In the fish-incubator can be produced over 500 000 fingerlings with more than 5 g weight per year.

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1. “native species” are considered organisms that inhabit the territory of the country as a result of the natural dissemination of flora and fauna, and subject to geological, climatic and other factors. Species that are introduced on purpose are called non-native, alien or exotic species. (Uzunova, E., Zlatanova S. 2007. A review of the fish introductions in Bulgarian freshwaters. Acta Ichthyologica & Piscatoria 37 (1): 55-61) [↑](#footnote-ref-1)
2. Project is named “Appointment of external organization for monitoring of the market of fish and fish products to assess the surplus in the aquacultures in Bulgaria” [↑](#footnote-ref-2)
3. Includes consumption at home and in catering facilities for 15 economically valuable species [↑](#footnote-ref-3)
4. With Decree of Council of Ministers 167/08.03.2013, the Managing Authority had a right to contract over the budget under measure 2.1 up to 40% of the budget measure [↑](#footnote-ref-4)
5. According data of NAFA as of September 2013 [↑](#footnote-ref-5)
6. According data of the Interim Assessment of Operational Program for development of “Fisheries” Sector in Republic of Bulgaria (2007-2013), Final Report [↑](#footnote-ref-6)
7. According data of the Annual report for the implementation of OPDFS (2007-2013) for 2011 [↑](#footnote-ref-7)