COMPLIANCE ASSESSMENT OF AQUACULTURE DEVELOPMENT TRENDS IN THE RUSSIAN FEDERATION TO UNIVERSAL TRENDS

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Abstract

Purpose of the study: The relevance of the research topic is due to the fact that the development of aquaculture is one of the key tools to ensure the necessary level of food security both in Russia in particular and on a global scale in general. The purpose of the article is to assess the development of aquaculture in Russia, in the context of global trends.

Methodology: To analyze the existing problem, theoretical and empirical methods, data aggregation methods, expert evaluation, classification and structuring of information, reference and statistical data, and a comparison method were used.

Results: The paper summarized the scientific and theoretical foundations of the definition’s essence of the “aquaculture” concept, as a result of which this concept was clarified, a classification of the main sub-complexes of aquaculture was given. The main vectors for the implementation of a systemic approach to the development of aquaculture, which have their relevance both nationally and globally, are highlighted. The article analyzes the current state and development trends of world aquaculture and fisheries, as well as the development of domestic aquaculture. The authors share the position of most scientists that in the medium term, aquaculture will occupy a dominant position compared to fishing, not only for environmental but also for economic reasons. According to the results of the study, it was concluded that in Russia, despite the presence of huge resource potential for the development of aquaculture, the main indicators for the functioning of this industry are significantly lagging behind global trends.

Applications of this study: Measures aimed at the formation of the growing trends of aquaculture development in Russia were proposed.

Novelty/Originality of this study: It can be noted that the implementation of the presented set of measures will contribute to the formation of growing trends in the development of aquaculture in Russia, which will correspond to the main global trends in this field.

Keywords: aquaculture, fishing, food and non-food use, world economy, reproduction of productive bioresources.

INTRODUCTION

The presence of distinct stagnation trends in the development of fisheries, due, on the one hand, to the depletion of natural aquatic bioproducts, and, on the other hand, to the decrease in the economic efficiency of this industry leads to the intensification of economic processes in aquaculture (Simon, 2019; Savstsova, 2018). The relevance of the formation of a systematic approach to the development of domestic aquaculture, taking into account existing global trends, is determined by the presence of a wide range of reasons. First of all, the development of aquaculture is one of the key instruments for ensuring the required level of food security both in Russia (Mayorova, 2019; Taubaye et al., 2018). In particular, and on a global scale in general. On the other hand, global trends in the intensification of economic processes in the field of aquaculture production indicate the undoubted importance of this area of economic activity for the functioning of the world economic system as a whole. The relevance of aquaculture development is also determined by the presence of an environmental factor (Bragin et al., 2018; Vieira Alves, 2018) which is caused by the rapid depletion of the biological reserves of the world’s oceans and the need for artificial replenishment of commercial aquatic biological resources, since their consumption by humanity significantly exceeds their natural reproduction.

METHODOLOGICAL FRAMEWORK

In order to study the development of aquaculture in Russia, within the framework of the formation of global trends, theoretical and empirical methods, data aggregation methods, expert evaluation, classification and structuring of information, reference and statistical data, and a comparison method were used.
The informational basis for assessing the development of aquaculture in Russia in the framework of the formation of global
trends was compiled by analytical reports on the state of world fisheries and aquaculture (2018) (The Food and Agriculture
Organization (FAO)), The state of world fisheries and aquaculture (2018). Achievement of sustainable development goals,
data from the Russian Federal Agency for Fisheries, as well as materials of scientific conferences and scientific
publications on development aquaculture.

LITERATURE REVIEW

The concept of aquaculture has recently become used in world economic terminology. In the publications of domestic
scientists, there are several basic interpretations of the essence of this phenomenon. Consider the most relevant of them. As
it is noted by K.L. Kudryashova (2018) aquaculture is a process of artificially reproducing objects of the aquatic living
world with a view to their further use and consumption. The key definition of this notion is the creation of an artificial,
human-controlled process of reproduction of aquatic living organisms.

From an economic point of view, it is considered necessary to examine the essence of the concept of aquaculture given by
A.I. Bogachev. According to this author, aquaculture is characterized by a controlled process of growing aquatic organisms
in order to obtain an economic effect from their use in the future. Undoubtedly, aquaculture should be considered as one of
the sectors of economic development, while aquaculture is an independent branch of the functioning of the economic
system, which combines both signs of crop production and signs of animal husbandry.

To form a complete picture of the question under study, let us present another definition of aquaculture, which is
recommended by V.V. Asharin. The indicated author notes that aquaculture is one of the areas of economic activity,
consisting in the organization of a controlled process of reproduction of fish, animals, and plants of the aquatic world with
a view to their further fishing, replenishing stocks of commercial products and expanding the volume of productive
biological resources. Thus, based on the generalization of the essential characteristics of the presented definitions of
aquaculture, one can identify the main features that correspond to this concept:

- Represents a certain type of economic activity, carried out within the framework of a single branch of the functioning
  of the economic system of a certain scale;
- This activity is human-controlled and carried out to solve current and future food security problems;
- The targets for the organization of the presented processes are not only the reproduction of productive aquatic
  biological resources but also the receipt of economic benefits from this type of activity.

RESULTS AND DISCUSSIONS

A Systematic Approach to Aquaculture Development

The concept of aquaculture is very capacious and includes a wide range of different activities. In Figure 1 the main
industry subcomplexes of aquaculture development are presented.

The development of each of the presented aquaculture subcomplexes occurs in the general context of the development of
this sector of economic activity, but taking into account the characteristics and targets of reproduction of productive
aquatic biological resources within each subcomplex separately.

The implementation of a systematic approach to the development of aquaculture includes several main areas of its
operation. In the publication by A. Lukin the main vectors of the implementation of a systematic approach to the
development of aquaculture are highlighted, which are as follows:

- Technological - the use of modern technologies for the reproduction of biological material of water bodies, without
  violating their consumer and natural properties in the environment controlled by humans;
- Ecological - the development of aquaculture should be directed not only to the reproduction of productive aquatic
  bioresources but also to the protection of natural population processes in the aquatic ecological environment;
- Economic - economic activity in the field of aquaculture should be economically effective and reasonable, that is,
  should bring a certain level of income to its functionaries and investors;
- Food - the use of aquaculture should be aimed at increasing the level of satisfaction of the needs of the population of
  the territory in aquatic products of plant and animal origin, that is, due to the development of aquaculture certain
  problems in the field of food security should be solved.

In the publication of I.P. Bogomolov, the assessment of the current state and development trends of world fisheries and
aquaculture is performed. According to the author, in the medium term (approximately 5-10 years) in a number of regions
of the world economy, aquaculture production volumes will catch up and even surpass the volume of fisheries.
Complementing the position of the previously mentioned author, E.V. Goncharova (2018) notes that the formation of this
trend will occur under the influence of environmental and economic factors, since, on the one hand, the natural biological
resources of the world’s oceans are exhaustible, and aquaculture production has tangible growth reserves. At the same
time, using modern technologies and management methods, aquaculture production is a more beneficial and profitable event.

![Diagram of Sectoral Subcomplexes of Aquaculture Development]

### Figure 1: The main industry subcomplexes of aquaculture development

#### Current Status and Development Trends of the World Aquaculture

It is advisable to conduct a study of the current state and development of world aquaculture and the place of Russia in it based on the analysis of a certain array of statistical data. In this regard, in table 1 the dynamics of indicators of production of world-wide fish farming and aquaculture products are considered.

**Table 1: Indicators of production of world fish farming and aquaculture**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2011 year</th>
<th>2012 year</th>
<th>2013 year</th>
<th>2014 year</th>
<th>2015 year</th>
<th>2016 year</th>
<th>2017 year</th>
<th>2017 year in % by year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishery, total, mln. Tons</td>
<td>92.2</td>
<td>89.5</td>
<td>90.6</td>
<td>91.2</td>
<td>92.7</td>
<td>90.9</td>
<td>91.3</td>
<td>99.02</td>
</tr>
<tr>
<td>including: in inland waters, million tons</td>
<td>10.7</td>
<td>11.2</td>
<td>11.2</td>
<td>11.3</td>
<td>11.4</td>
<td>11.6</td>
<td>11.7</td>
<td>109.35</td>
</tr>
<tr>
<td>in the seas, million tons</td>
<td>81.5</td>
<td>78.3</td>
<td>79.4</td>
<td>79.9</td>
<td>81.3</td>
<td>79.3</td>
<td>79.6</td>
<td>97.67</td>
</tr>
<tr>
<td>Total aquaculture, mln. Tons</td>
<td>61.8</td>
<td>66.4</td>
<td>70.2</td>
<td>73.7</td>
<td>76.1</td>
<td>80</td>
<td>85.3</td>
<td>138.03</td>
</tr>
<tr>
<td>including: in inland</td>
<td>38.6</td>
<td>42</td>
<td>44.8</td>
<td>46.9</td>
<td>48.6</td>
<td>51.4</td>
<td>53.7</td>
<td>139.12</td>
</tr>
</tbody>
</table>
Based on the analysis of statistical data presented in Table 1, it can be concluded that the indicators of world fisheries and aquaculture for the period of the study have a steady upward trend, which is due to the growing needs of the population for food and an increase in the consumption of seafood. In 2017, compared to 2011, the volume of world fisheries and aquaculture increased by 14.68%. Production figures for world fisheries and aquaculture increased from 154 million tons in 2011 to 176.6 million tons in 2017. However, it is worth noting that the growth of production of the world's productive bioresources occurs primarily due to an increase in the volume of aquaculture, while the indicators of the development of fisheries are slightly, but steadily declining.

The evaluation of statistical data allows concluding that in 2017 compared to 2011, the volume of aquaculture production increased by 38.03%, in real terms, this indicator increased from 61.8 million tons in 2011 to 85.3 million tons in 2017. The volume of fishery production on a global scale is reduced from 92.2 million tons in 2011 to 91.3 million tons in 2017, that is, the relative base rate of decline for 2011-2017 was 0.8%. To study the annual indicators of the development of world fisheries and aquaculture, let us turn to the materials of Figure 2, which presents the annual growth rates of production by these sectors of the global economy.

As can be seen from Figure 2, the annual growth rate of world aquaculture production over 2011-2017 always has a positive value, which indicates the existence of a steady growth trend for this indicator and the growing importance of the aquaculture industry in the global economic system. Growth rates of world fisheries production, on the contrary, have both positive and negative values, which indicates the variability of the development of this indicator and the absence of its clear dynamics. These circumstances give reason to say about reducing the relevance of the development of fisheries in the framework of global economic activity.

The actualization of the increase in the production of fisheries and aquaculture products is due to the growth in the consumption of the biological resources of the aquatic world, both for industrial and food purposes. In Table 2, the dynamics of the global use of fisheries and aquaculture products are considered.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fishing growth rate, %</th>
<th>Aquaculture growth rate, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>-2.93</td>
<td>7.44</td>
</tr>
<tr>
<td>2013</td>
<td>-1.94</td>
<td>5.72</td>
</tr>
<tr>
<td>2014</td>
<td>0.66</td>
<td>4.99</td>
</tr>
<tr>
<td>2015</td>
<td>1.33</td>
<td>3.25</td>
</tr>
<tr>
<td>2016</td>
<td>1.64</td>
<td>5.12</td>
</tr>
<tr>
<td>2017</td>
<td>0.44</td>
<td>6.62</td>
</tr>
</tbody>
</table>

**Figure 2:** Growth rates of production of world fishery and aquaculture products

As can be seen from Figure 2, the annual growth rate of world aquaculture production over 2011-2017 always has a positive value, which indicates the existence of a steady growth trend for this indicator and the growing importance of the aquaculture industry in the global economic system. Growth rates of world fisheries production, on the contrary, have both positive and negative values, which indicates the variability of the development of this indicator and the absence of its clear dynamics. These circumstances give reason to say about reducing the relevance of the development of fisheries in the framework of global economic activity.

The actualization of the increase in the production of fisheries and aquaculture products is due to the growth in the consumption of the biological resources of the aquatic world, both for industrial and food purposes. In Table 2, the dynamics of the global use of fisheries and aquaculture products are considered.

Based on the materials of Table 2, it can be concluded that the global use of fisheries and aquaculture products has a steady upward trend. The global use of fisheries and aquaculture products increased from 154 million tons in 2011 to 175.6 million tons in 2017, that is, on average for the time period studied, the value of this indicator increased by 14.03%. The predominant use of products from world fisheries and aquaculture is food use. The size of the food use of world fisheries and aquaculture products increased in 2017 compared to 2011 by 19.31%. The largest increase in food use of world fisheries and aquaculture products was recorded in 2012 compared with 2011 by 4.92%, and in 2014 compared with 2013 by 3.35%.
The research work of the aquaculture market is devoted to the scientific work of Ya.S. Savtsov (2018). Within the framework of this publication, the author notes that the world aquaculture market, besides the fact that it has rather high rates of industrial growth, also has a rather stable regional production structure. A clear leader in the aquaculture industry on a global scale is China, which accounts for more than half of all manufactured products in the industry. In Table 3, we present the main indicators of aquaculture development by major regions of the world economy.

Table 2: Dynamics of world use of fishery and aquaculture products

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2011 year</th>
<th>2012 year</th>
<th>2013 year</th>
<th>2014 year</th>
<th>2015 year</th>
<th>2016 year</th>
<th>2017 year</th>
<th>% to 2011 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total use, mln. Tons</td>
<td>154</td>
<td>156</td>
<td>160.7</td>
<td>164.8</td>
<td>168.7</td>
<td>170.9</td>
<td>175.6</td>
<td>114.03</td>
</tr>
<tr>
<td>Growth rate, chain, %</td>
<td>-</td>
<td>1.30</td>
<td>3.01</td>
<td>2.55</td>
<td>2.37</td>
<td>1.30</td>
<td>2.75</td>
<td>-</td>
</tr>
<tr>
<td>Food use, mln. Tons</td>
<td>130</td>
<td>136.4</td>
<td>140.1</td>
<td>144.8</td>
<td>148.4</td>
<td>151.2</td>
<td>155.1</td>
<td>119.31</td>
</tr>
<tr>
<td>Growth rate, chain, %</td>
<td>-</td>
<td>4.92</td>
<td>2.71</td>
<td>3.35</td>
<td>2.49</td>
<td>1.89</td>
<td>2.58</td>
<td>-</td>
</tr>
<tr>
<td>Non-food use, mln. Tons</td>
<td>24</td>
<td>19.6</td>
<td>20.6</td>
<td>20.3</td>
<td>19.7</td>
<td>20.5</td>
<td>85.42</td>
<td></td>
</tr>
<tr>
<td>Growth rate, chain, %</td>
<td>-</td>
<td>-18.33</td>
<td>5.10</td>
<td>-2.91</td>
<td>1.50</td>
<td>-2.96</td>
<td>4.06</td>
<td>-</td>
</tr>
<tr>
<td>Per capita apparent consumption, kg</td>
<td>18.5</td>
<td>19.2</td>
<td>19.5</td>
<td>19.9</td>
<td>20.2</td>
<td>20.3</td>
<td>20.4</td>
<td>110.27</td>
</tr>
<tr>
<td>Growth rate, chain, %</td>
<td>-</td>
<td>3.78</td>
<td>1.56</td>
<td>2.05</td>
<td>1.51</td>
<td>0.50</td>
<td>0.49</td>
<td>-</td>
</tr>
</tbody>
</table>


At the same time, the opposite trend is observed in the study of the dynamics of the volume of non-food use of world fishery products and aquaculture. The value of non-food use of world fisheries and aquaculture products decreased in 2017 compared to 2011 by 14.58%. The largest drop in non-food use of world fisheries and aquaculture products occurs in 2012 compared with 2011 by 18.33% and in 2016 compared with 2015 by 2.96%. The overall increase in food and non-food use of world fisheries and aquaculture products contributed to an increase in per capita consumption of this type of product in 2017 compared to 2011 by 10.27%.

The research work of the aquaculture market is devoted to the scientific work of Ya.S. Savtsov (2018). Within the framework of this publication, the author notes that the world aquaculture market, besides the fact that it has rather high rates of industrial growth, also has a rather stable regional production structure. A clear leader in the aquaculture industry on a global scale is China, which accounts for more than half of all manufactured products in the industry. In Table 3, we present the main indicators of aquaculture development by major regions of the world economy.

Table 3: The main indicators of aquaculture development by major regions of the world economy

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2011 year</th>
<th>2012 year</th>
<th>2013 year</th>
<th>2014 year</th>
<th>2015 year</th>
<th>2016 year</th>
<th>2017 year</th>
<th>% to 2011 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total aquaculture, mln. Tons</td>
<td>61.8</td>
<td>66.4</td>
<td>70.2</td>
<td>73.7</td>
<td>76.1</td>
<td>80</td>
<td>85.3</td>
<td>138.03</td>
</tr>
<tr>
<td>including by countries and regions: China, million tons</td>
<td>38.3</td>
<td>40.2</td>
<td>42.7</td>
<td>43.5</td>
<td>45.2</td>
<td>47.8</td>
<td>49.8</td>
<td>130.03</td>
</tr>
<tr>
<td>North and South America, million tons</td>
<td>2.3</td>
<td>2.5</td>
<td>2.7</td>
<td>3.2</td>
<td>3.3</td>
<td>3.5</td>
<td>3.8</td>
<td>165.22</td>
</tr>
<tr>
<td>Africa, million tons</td>
<td>1.2</td>
<td>1.3</td>
<td>1.5</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
<td>1.9</td>
<td>158.33</td>
</tr>
<tr>
<td>Europe, million tons</td>
<td>2.2</td>
<td>2.3</td>
<td>2.4</td>
<td>2.5</td>
<td>2.5</td>
<td>2.7</td>
<td>2.8</td>
<td>127.27</td>
</tr>
<tr>
<td>Oceania, million tons</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.3</td>
<td>0.3</td>
<td>150.00</td>
</tr>
<tr>
<td>Asia (without China), mln. Tons</td>
<td>17.6</td>
<td>19.9</td>
<td>20.7</td>
<td>22.8</td>
<td>23.2</td>
<td>23.9</td>
<td>26.7</td>
<td>151.70</td>
</tr>
</tbody>
</table>


Based on the statistical data presented in Table 3, it can be concluded that aquaculture development indicators for all major regions of the world economy have a steady upward trend. The volume of aquaculture production in China in 2017 increased compared to 2011 by 30.03%. For the rest of the world economy, the largest increase in aquaculture production for 2011-2017 is observed in North and South America at a rate of 65.22%, Africa - 58.33% and Asia excluding China at the level of 51.70%. The growth of aquaculture production in all major regions of the world economic system once again underlines the relevance and importance of the development of this industry to improve the productivity and efficiency of the world economy. In Figure 3, the structure of aquaculture production in 2011 and 2017 in the global economic system is presented.
As can be seen from Figure 3, the structure of aquaculture production in the scale of the world economic system has practically not changed. The dominant position in the global economy in aquaculture production belongs to China, whose share in the total global volume of aquaculture production decreased slightly from 61.97% in 2011 to 58.38% in 2017. Among other trends, an increase in the share of Asian countries in the total volume of aquaculture production within the world economic system from 28.48% in 2011 to 31.30% in 2017 can be noted. However, in general, it is possible to draw a conclusion about a steady and stable production structure of the world aquaculture market, which practically does not vary during the studied time interval.

Aquaculture Development in Russia

Having considered the global trends in aquaculture development, it is necessary to assess the state and development of this issue in the domestic economy. As predicted in his publication V.V. Asharin, the volume of aquaculture production in Russia has a steady upward trend, which corresponds to the existing global trend of development of this sector of the global economic system. In this case, according to L.V. Romanova (2018) the current state of aquaculture development in Russia leaves much to be desired. Despite the high rates of industrial development of this industry, which have been formed in recent years, the total share of Russian aquaculture production on a global scale is less than 0.3%. Given the huge resource potential of aquaculture development in Russia, these indicators are extremely low (Vorobiev, 2015; Glebova et al., 2019). In table 4, the indicators of aquaculture development in Russia are considered.

Table 4: Indicators of aquaculture development in Russia

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2011 year</th>
<th>2012 year</th>
<th>2013 year</th>
<th>2014 year</th>
<th>2015 year</th>
<th>2016 year</th>
<th>2017 year</th>
<th>2017 year in % to 2011 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total aquaculture production, thousand tons</td>
<td>157,8</td>
<td>172,3</td>
<td>187,5</td>
<td>190,3</td>
<td>197,3</td>
<td>215,7</td>
<td>223,8</td>
<td>141,83</td>
</tr>
<tr>
<td>Growth rate, chain,%</td>
<td>-</td>
<td>9.19</td>
<td>8.82</td>
<td>1.49</td>
<td>3.68</td>
<td>9.33</td>
<td>3.76</td>
<td>-</td>
</tr>
<tr>
<td>including: in inland waters, thous. tons.</td>
<td>78.4</td>
<td>85.8</td>
<td>93.6</td>
<td>99.8</td>
<td>107.8</td>
<td>113.3</td>
<td>125.7</td>
<td>160.33</td>
</tr>
<tr>
<td>in the seas, thousand tons</td>
<td>79.4</td>
<td>86.5</td>
<td>93.9</td>
<td>90.5</td>
<td>89.5</td>
<td>102.4</td>
<td>98.1</td>
<td>123.55</td>
</tr>
<tr>
<td>Fishing, thousand tons</td>
<td>3895</td>
<td>3912</td>
<td>3995</td>
<td>4120</td>
<td>4231</td>
<td>4281</td>
<td>4358</td>
<td>111,89</td>
</tr>
<tr>
<td>Growth rate, chain,%</td>
<td>-</td>
<td>0.44</td>
<td>2.12</td>
<td>3.13</td>
<td>2.69</td>
<td>1.18</td>
<td>1.80</td>
<td>-</td>
</tr>
<tr>
<td>Number of enterprises specializing in aquaculture, pcs.</td>
<td>2489</td>
<td>2517</td>
<td>2552</td>
<td>2595</td>
<td>2613</td>
<td>2638</td>
<td>2653</td>
<td>106,59</td>
</tr>
<tr>
<td>Growth rate, chain,%</td>
<td>-</td>
<td>101.12</td>
<td>101.39</td>
<td>101.68</td>
<td>100.69</td>
<td>100.96</td>
<td>100.57</td>
<td>-</td>
</tr>
<tr>
<td>Share in world aquaculture</td>
<td>0.255</td>
<td>0.259</td>
<td>0.267</td>
<td>0.258</td>
<td>0.259</td>
<td>0.270</td>
<td>0.262</td>
<td>-</td>
</tr>
</tbody>
</table>
Based on the analysis of the statistical data presented in Table 4, it can be concluded that in Russia, in the period under study, there is an increase in the volume of aquaculture production, which indicates an increase in production and economic processes in the industry. Calculations showed that in 2017 compared to 2011, the volume of aquaculture production in Russia grew by 41.82%. The largest increase in aquaculture production was observed in 2012 compared to 2011 in the amount of 9.19% and in 2016 compared to 2015 by 9.33%. The increase in aquaculture production in Russia occurs both in inland waters (in 2017 compared with 2011, growth was 60.33%) and in the seas (in 2017 compared with 2011, growth was 23.55%). A positive characteristic of the development of the aquaculture industry in Russia is the increase in the number of enterprises that specialize in organizing an economic activity in this industry. The number of organizations specializing in aquaculture in Russia in 2017 increased compared to 2011 by 6.59%.

In addition to aquaculture, indicators of fishing volumes in Russia have a positive development. Calculations showed that in Russia in 2017 compared with 2011, the volume of fisheries increased by 11.89%. The global trend of aquaculture development is to achieve production indicators of this industry volume indicator of fisheries. In Russia, the share of aquaculture in the total volume of fisheries is significantly small, which indicates the country's lagging behind the global production trends in this industry. In Figure 4, we present the dynamics of the share of aquaculture in the total volume of fisheries in Russia.

As can be seen from Figure 4, the share of aquaculture in the total volume of fisheries in Russia is increasing during the study period from 4.05% in 2011 to 5.14% in 2017, but in general the value of this indicator is extremely small, which once again gives rise to argue about the low activity of economic processes in aquaculture in Russia.

Thus, it can be concluded that the main trend of the world economic system in the production of aquatic bioproducts is the achievement of aquaculture production indicators of fisheries development, and in some regions even the excess of these values. According to estimates, the majority of specialists in the medium term will intensify the trend to enhance the development of world aquaculture.

**CONCLUSION**

According to the results of the study, it can be concluded that, within the framework of the world economic system, there are distinct trends in the growth of aquaculture, primarily in the area of food supply for end-users. In this context, it is worth noting that, despite the presence of huge resource potential for the development of aquaculture, in terms of the main indicators, the functioning of this industry lags significantly behind global trends. To eliminate the marked negative trends in this area of economic development of Russia, it is necessary to implement the following set of measures:

- Improving the effectiveness of the use of the natural forage base of water bodies through the introduction and cultivation of the most productive polycultures;
- Introduction of resource-saving technologies and principles of benchmarking in the economic processes of aquaculture production in order to reduce production cost and increase the competitiveness of these products on the market;
- Implementation of mechanisms for state support of aquaculture development through the use of the principles of co-financing, investment financing, project development, implementation of a system of national standards and technical regulations;
- Optimization of logistic processes in the field of the functioning of the aquaculture industry in order to create conditions for access to food markets and improve business results;
- Innovative modernization of the aquaculture production complex of Russia with the aim of not only reducing the unit costs but also increasing the intensity of production processes in the industry.

In general, it can be noted that the implementation of the presented set of measures will contribute to the formation of growing trends in the development of aquaculture in Russia, which will correspond to the main global trends in this field.

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The author confirms that the data do not contain any conflict of interest.

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The author confirms that the data do not contain any conflict of interest.


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