

# **Index of the Fisheries Sector Cluster Competitiveness**

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**Abstract.** The aim of the research is to create the Index of Fisheries Sector Cluster Competitiveness – tool aimed for assessing the competitiveness and development of the Fisheries Sectors cluster from time to time. Based on the studied scientific literature the research provides an improved definition of the sector's competitiveness and defines the factors influencing the competitiveness of the Fisheries Sector. As a result of the analysis the author discovered that there are several internal and external social, economic, political, natural and cultural environmental factors, which influence the competitiveness of the fisheries sector cluster, which must be taken into account creating the Index of Fisheries Sector Cluster Competitiveness. The development Index of Fisheries Sector Cluster Competitiveness may assist the institutions involved in the fisheries' policy formation to work more successfully and improve the common policy in the fisheries sector.

**Keywords:** Fisheries Sector, cluster, model, index, competitiveness.

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## **1. Introduction**

The world economy faces changes, mostly related to the processes of globalization, uneven development of the countries, as well as reinforcement of competitiveness. Nowadays competitiveness of some country's companies more and more determines and influences the development potential of each country. One of the key aims in development strategy of states, spheres and companies has become ensuring competitiveness (Škapars, R., Šumilo, Ē. 2006). Assessment of competitiveness is a significant element in evaluation of economic performance and sustainability of a sphere and its companies.

Peculiarity of competitiveness lies in the fact that it contains consequences not only of the economic category (product, consumer and environment of rivals, etc.), but also of the non-economic category (systems of education, science, demography, politics and values, etc.), what determines the problems of evaluating thereof. Nowadays scientists working in the field of economics and entrepreneurship believe that the factors influencing the competitiveness are interrelated and should be evaluated in a common context.

The aim of the author is to elaborate an Index of the Fisheries Sector Cluster Competitiveness, as a tool aimed at assessing the development of the fisheries sector's cluster in the course of time, defining factors obstructing and facilitating the competitiveness thereof.

To reach the aim the following tasks were set:

- 1) to study and analyze the essence and its definitions of the sector cluster competitiveness;
- 2) to elaborate the model of factors influencing the competitiveness of the Fisheries sector cluster;
- 3) to elaborate the Index of Fisheries Sector Cluster Competitiveness.

The Index of Fisheries Sector Cluster Competitiveness can be used as an instrument for assessing the state fishing, aquaculture and fish processing competitiveness. Index may assist the institutions involved in the fisheries' policy formation to work more successfully and improve the common policy in the fisheries sector.

Novelty of the research – development of the concept ‘Sector Competitiveness’ definition, Model of Competitiveness of the Fisheries Sector’s Cluster and Index of the Fisheries Sector Cluster Competitiveness.

Research methods– the paper deals with the generally accepted theoretical research methods: analysis and synthesis, as well as method of determining the indicators, comparison, grouping and graphic depiction.

The theoretical and methodological basis of the research consists of the works of the foreign and Latvian scientists, their researches and publications. The research also views planning documents, reviews, reports and researches prepared by the EU and Latvian state institutions.

## **2. Nature of competitiveness and definition of the concept**

There are comparatively few studies on the competitiveness of the sphere; moreover, what concerns the competitiveness of the fisheries sector there are no studies at all. Often the concept “competitiveness” is used in the debates of pol-

icy of economics, where these term associated meanings often differ and in many cases are not shown clearly enough.

The concept of companies' competitiveness and its theoretical fundamentals have been developing historically for long time, what allowed defining various aspects of the concept of competitiveness. However, despite the contribution of many writers into the research of the nature of the sphere competitiveness, the author arrives at the conclusion that still there is no unified and generally accepted definition of companies' competitiveness and its evaluation methodology.

The concept "competitiveness" derived from the concept "competition", which from the Latin language „concurrentia" means "collision", "competition" (Михайлов, О.В. 1999). The competitiveness theory was summarized by Smith A., who was the first to define the concept of competitiveness as competition, formulating the main principle of competitiveness – "the concept of invisible hand". If we take competition as an emulative action of economic subjects, then competitiveness is "the subject's qualities, giving it an opportunity to complete the actions, which allow succeeding in the rivalry" (Михайлов, О.В. 1999). Competitiveness along with the concept of competition is one of the most important categories describing the commodity and service market, as well as one of the most significant factors of entrepreneurship influencing any company in the economic sector (Fedotova, K., Geipele, I. 2009).

The representatives of the International Monetary Fund believe that competitiveness is the ability of a company to produce and offer goods and services of international quality standards more cost effectively than other companies (Bella, G.D., Lewis, M., Martin, A. 2007).

World Economic Forum defines competitiveness as today's and future's ability and possibility of entrepreneurs to create to the world commodities, possessing price and extra-price qualities, which are more attractive than of the other domestic and foreign competitors (World Economic Forum 2009). In the further World Economic Forum reports competitiveness was defined as a set of institutions, policies and factors that determine the level of productivity of a county, thus setting the level of prosperity. The level of productivity also determines the rates of return obtained by investments in an economy, and consequently – the competitiveness of an economy (World Economic Forum 2014).

One of the most famous scholars in the field of economy competitiveness Porter M.E. believes that competitiveness should be viewed as productivity of a company (Porter, M.E. 1990). Companies and countries able to reach the nec-

essary level of productivity obtain the competitive advantage (Kassalis, I. 2010).

In opinion of Fedotova K. and Geipele I. competitiveness is an ability of a company, sector or country to sell its offer in the market. It is an indicator of successful company's activity, influencing the development of an enterprise and further growth prospective (Fedotova, K., Geipele, I. 2009). Company's competitiveness is the ability to produce goods and provide services of higher quality for lower costs, than domestic and international competitors. Competitiveness is an acknowledgement of the price conformity of the company's produced goods and the production process efficiency (Kassalis, I. 2010).

The winner of the Nobel Prize in economics Kuznets S.S. defines competitiveness as a long-term increasing productivity based on progressive technology and institutional and ideological corrections (Kuznets, S.S. 1971, 1973). In this case Kuznets S.S. defines competitiveness as a body of factors determining the level of institutional, policies and state productivity, measured as a level of productivity, setting also a sustainable welfare level, evaluated by the society. A more competitive national economy is able to create its inhabitants higher level income (Kuznets, S.S. 1971, 1973). The relation of competitiveness and productivity was studied by Krugman P., pointing out that competitiveness may be considered as an absolute level of productivity and its dynamics (Krugman, P. 1994).

Organization for Economic Co-operation and Development in its study called "Indicators of international competitiveness: conceptual aspects and evaluation" and the EU strategy 2020 emphasized work productivity, described as foundation of competitiveness, investments and welfare (Durand, M., Giorno, C. 1987; Eiropas Komisija 2010). Competitiveness means increase in productivity which is the only way to achieve a sustained growth of income (per capita) which consequently increases the standard of living (European Commission 2011, 2014; World Economic Forum 2014). The World Competitiveness Yearbook defines competitiveness in a much wider sense: economy manages the totality of its resources and competencies to increase the prosperity of its population (IMD World Competitiveness Center 2012).

United Nations Industrial Development Organization believes that the competitiveness of the sphere is evaluable and measurable as a part of market (intensity of export) and added value per capita (United Nations Industrial Development Organization 2013). In the foundation of achieving high level of welfare there are powerful market positions in separate specific spheres, based on academic work concerning policies of strategic trade sectors.

The Terminology Commission of the Latvian Academy of Sciences explains competitiveness as a degree of process compliance with the requirements of the chosen market according to the technical, economic and other indicators. It is the proficiency of a company and its management in creating good commodity and service market, solving technology, production, service, human resources, practical skills and knowledge, strategic and calendar planning issues, as well as employing the right sale policy, good quality of production and service, high level of co-service etc. (Latvijas Zinātņu akadēmijas Terminoloģijas komisija 2015).

Centre for International Competitiveness, founded in 2007 and focused in the research of competitiveness of a company and economy, defines competitiveness as the capability of an economy to maintain increasing standards of living for those who participate in it, by attracting and maintaining firms with stable or rising market shares in an activity (Centre for International Competitiveness 2015). Competitiveness in a region will depend on its ability to predict and successfully adapt to the internal and external social and economic challenges, ensuring new economic opportunities, including higher quality workplaces.

The author highlights that the competitiveness of the sector is the ability to work efficiently, sell higher-quality output (goods and services) than the domestic and international competitors in the markets.

### **3. Model of Factors Influencing Competitiveness of the Fisheries Sector's Cluster**

On the basis of the researches and their summaries carried out by several scholars, the author concludes that competitiveness is influenced by various interrelated microeconomic and macroeconomic factors (Fig. 1.). In the researches, increasing number of scholars emphasizes various factors of specific spheres and their companies, which facilitate activity. In this case, superiority of competitiveness of a sphere and companies in it takes the form of advantages and their identification.

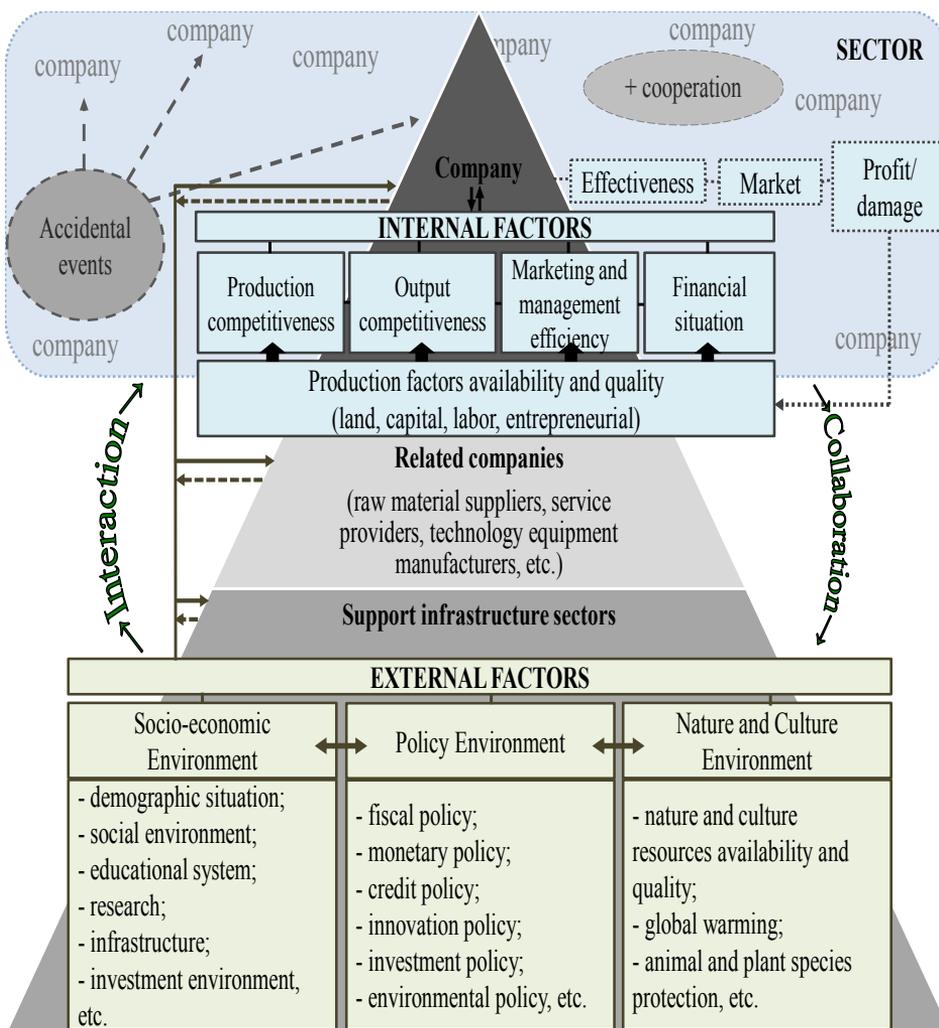


Fig. 1. Model of the Factors Influencing Competitiveness of the Fisheries Sector's Cluster (Source: author created)

Any production process comprises interaction of several production factors, namely: land, capital, labour and entrepreneurship (Smith, A. 1776; Ricardo, D. 1817; Mill, J.S. 1848; Karl, M. 1867). Porter M.E. holds a view that a company must have sufficient and qualitative production factors in order to compete in the corresponding sphere (Porter, M.E. 1990). Production factors may vary depending on the specialization of a company, and it is possible to supplement them in order to compensate disadvantages of separate factors. Performing in

stable economic and political environment, growth of national economy may be facilitated by increase in provision of production factors; as a result, volume of production and productivity of employees is increasing (Charles, W.C., Douglas, P.H. 1928).

A company may increase its competitiveness if it uses production factors, which are at its disposal, in an efficient manner and is able to produce high-quality production at a lower prime cost in comparison with other companies in the same sphere, as well as sells it in the market at the prices which attracts consumers (Caune, J., Dzedons, A., Pētersons, L. 2003; Priede, J. 2010).

In order a company could offer competitive production in a globalised world when competition is increasing, it has to direct its economic activities towards the usage of innovations and technologies which are related to novelties (Tirupati, D. 2008). One of the main ways, how to develop a sphere and increase competitiveness of its companies in the future, is to support innovations and facilitate collaboration with the science (Latvijas Valsts agrārās ekonomikas institūts 2013, 2014b). Knowledge shall be transformed into innovations (Reynolds, P.D. 1999; Romer, P.M. 1994). Environment of competition requires from the companies to turn to innovations (including also novelties in cultural and social field) which are one of the main driving forces of new economics which is directed towards knowledge (Latvijas Investīciju un attīstības aģentūra 2007). The usage of new technologies during production process facilitates international trade (potential of export) and productivity of labour (Reģionālās attīstības un pašvaldību lietu ministrija 2006; Rostow, W.W. 1960). Exporting producers and innovative companies facilitate increase of competitiveness (Gorodnichenko, Y., Schnitzer, M. 2010). Conversely, work efficiency depends on psychophysiological welfare of the employees which may have direct or indirect influence upon competitiveness of a company (Воронов, Д.С., Партнеры 2013).

Conditions and peculiarities of demand factors (quality, volume, conformity with the development tendencies in the world market, etc.) in market may help to form advantages of competitiveness for the companies, thus creating improved products and novelties much quicker and more in comparison with the competitors (Porter, M.E. 1990). In the international market prices, costs and wages influence competitiveness (Draghi, M. 2012). Innovations focus on involvement of highly qualified professionals and every creative person in economic activities; as a result, new products and services with high added value occur in the world's, regional and local market, thus ensuring significant in-

crease in gross domestic product and formation of new workplaces (Latvijas Investīciju un attīstības aģentūra 2007). Innovations are necessary in order to avoid economic stagnation (Pasinetti, L.L. 1981).

The main success factor of a company is profit; however, in order to gain it, increasing sales volume shall be ensured by lowering production costs what may be done with the help of marketing activities (Fedotova, K. Geipele, I. 2009) and appropriately chosen marketing strategy (Simpson, M., Taylor N. 2002). Taking into account the fact that implementation of marketing activities in a company is complicated process which is influenced by various internal and external factors (for instance, lifetime of a company, the aim, knowledge and attitude of company's manager, competition, etc.), company's management shall choose the most efficient marketing strategy, as a result of which financial parameters of a company are influenced positively (Simpson, M., Padmore J., Taylor N., Frecknall-Hughes J. 2006). The companies succeed in business if they are able to satisfy needs and expectations of the consumers by implementing efficient marketing strategy and activities subordinated to it (Becherer, R.C. Halstead, D. Haynes P.J. 2003; Berthon, P., Ewing, T.M., Napoli, J. 2008; Moorman, C., Rust, R.T. 1999; Webster, F.E. 1981, 1992, 2002).

In order a company could increase its competitiveness, formation of powerful and dominant brands has a special role; they serve as a mark of identification, identity and quality for a company (Kassalis, I. 2010; Latvijas Valsts agrārās ekonomikas institūts 2014a; Webster, F.E, Malter, A.J., Ganesan, S. 2003). Formation of company's image is an important element of public relations (Kotlers, F. 2006) which creates competitive advantages for the companies. In a case when positive company's image is created, a company has an opportunity to gain wider range of consumers and collaboration partners rather than in a case when negative company's image is created. Formation of successful and positive company's image shall be based on comprehensive, easily perceptible and unambiguous company's logo, slogan and visual elements and economic activities of a company shall be oriented towards the principles and rules of morality which are generally accepted in the society.

Frequently, exactly the lack of knowledge and experience in the companies hinder them from efficient work, therefore, they face problems when competing with foreign companies having decades of experience (Fedotova, K., Geipele, I. 2009). Along with that, transformation of knowledge and contacts from the world's leading universities by inviting various lecturers is an efficient way of education development and internationalization (Troen, S.I. 1992). Cooperation

plays a significant role in facilitation of exchange of knowledge and experience (Boroņenko, V. 2009, Kučinskis, J. 2004, 2009). A company cannot achieve high competitiveness operating isolated – collaboration with other companies, state institutions and other organizations may have a positive influence upon efficiency of a company, and is necessary (Kassalis, I. 2010). French theorist Charles G. had maintained: “Cooperation is a daughter of poverty and mother of prosperity” (Charles, G. 1891). As a result of cooperation, work productivity, quality and income increases, new workplaces are created, time and energy is saved, education, inculcated togetherness and need for common benefit is promoted; consequently, national economy is developing in general (Engels, F. 2011; Kučinskis, J. 2004, 2009). The principle of performance of cooperatives is: “One for all and all for one!” (Kučinskis, J. 2004, 2009). Collaboration shall be based on the loyalty and initiative (Fedotova, K., Geipele, I. 2009). Events supporting competence (seminars, trainings, excursions, etc.), facilitating the process of knowledge and experience exchange among the companies, are important (Athiyaman, A., Parkan, C. A. 2008).

M. Porter emphasizes also the role of two other factors which may influence competitiveness; they are – the random events and government.

A company has considerable difficulties to predict random events (for instance, natural disasters), and they are practically uncontrollable. Random events may have huge influence upon competitiveness of the companies since they can cause interruption in production; as a result, part of companies loses their position of competitiveness, but the other part – gains (Porter, M.E. 1990).

Conversely, the government may influence tax and investment policy, local market and competition among the companies, conditions for import and export, legislation, etc. Intervention of the state may occur at local, regional, state, as well as international level. The reason for evaluation of political processes and their performance is the fact that the measures, which are considered as productive and promotional, may turn out to be less productive or even non-productive in practice due to inefficient structure of institutions (Devarajan, S., Swaroop, V., Zou, H. 1996). Lack of formation of politics and its influence upon competitiveness may rather indicate insufficient structure of institution than politics itself (Acemoglu, D., Johnson, S., Robinson, J., Thaicharoen, Y. 2003; Acemoglu, D., Robinson, J. 2010).

Related companies and the spheres included in support infrastructure depend on the development of leading companies in a sphere. When leading companies of a sphere are developing, both related companies and the spheres included in

support infrastructure have benefit. In the environment of the cluster, integrated long-term development of the companies may be observed at horizontal and vertical level; as a result, not only competitiveness of the companies in a sphere increases, but also competitiveness of a region and country does.

In this case state competitiveness directly depends on the competitiveness of every company working in a specific economic sector. The more competitive are the companies in the certain sector, the more competitive is corresponding sphere, and consequently the state is more competitive at the world level (Škarpars, R., Šumilo, Ē. 2006; Labklājības ministrija 2007; Deņisovs, M., Judrupa, I. 2008; Бочкова, С. 2009).

#### **4. Index of the Fisheries Sector cluster competitiveness**

The Index of Fisheries Sector Cluster Competitiveness allows evaluating the factors, which maintain the current competitiveness in fishing, aquaculture and fish processing (1. formula).

$$FSCCI = \left( \frac{I_F + I_{AQ} + I_{FP}}{n} \right) \rightarrow \text{value}, \quad (1)$$

where:  $FSCCI$  - Fisheries Sectors Cluster Competitiveness Index,  $I_F$  - Fishing Competitiveness Index,  $I_{AQ}$  - Aquaculture Competitiveness Index,  $I_{FP}$  - Fish processing Competitiveness Index,  $n$  - number of sectors.

The Competitiveness Index of Fishing, Aquaculture and Fish processing is a function from the factors, influencing the competitiveness of the fisheries sector's cluster and their relative weight (2. formula).

$$I_F, I_{AQ}, I_{FP} = f(\alpha_1 F_1, \alpha_2 F_2, \alpha_3 F_3, \dots, \alpha_n F_n) \rightarrow \text{value}, \quad (2)$$

where:  $I_F$  - Fishing Competitiveness Index,  $I_{AQ}$  - Aquaculture Competitiveness Index,  $I_{FP}$  - Fish processing Competitiveness Index,  $\alpha_1 \dots \alpha_n$  - relative scales,  $F_1 \dots F_n$  - factors influencing the competitiveness of fishing, aquaculture, fish processing.

The Competitiveness Index of Fishing, Aquaculture and Fish processing is calculated on the basis of several sub-indexes: Sub-index of Availability and

Quality of Production Factors, Sub-index of Production Competitiveness, Sub-index of Output Competitiveness, Sub-index of Marketing and Management Efficiency, Sub-index of Financial Position, Sub-index of Cooperation, Sub-index of Social and Economic Environment, Sub-index of Political Environment, Sub-index of Natural and Cultural Environment, and their relative weight (3. formula).

$$I_F, I_{AQ}, I_{FP} = (\alpha_1 F_{AQPF} + \alpha_2 F_{PC} + \alpha_3 F_{OC} + \alpha_4 F_{MME} + \alpha_5 F_{FP} + \alpha_6 F_C + \alpha_7 F_{SEE} \quad (3) \\ \text{value,})$$

where:  $I_F$  - Fishing Competitiveness Index,  $I_{AQ}$  - Aquaculture Competitiveness Index,  $I_{FP}$  - Fish processing Competitiveness Index,  $\alpha_1 \dots \alpha_9$  - relative scales,  $F_{AQPF}$  - Sub-index of Availability and Quality of Production Factors,  $F_{PC}$  - Sub-index of Production Competitiveness,  $F_{OC}$  - Sub-index of Output Competitiveness,  $F_{MME}$  - Sub-index of Marketing and Management Efficiency,  $F_{FP}$  - Sub-index of Financial Position,  $F_C$  - Sub-index of Cooperation,  $F_{SEE}$  - Sub-index of Social and Economic Environment,  $F_{PE}$  - Sub-index of Political Environment,  $F_{NCE}$  - Sub-index of Natural and Cultural Environment.

As a result, we acquire a comprehensive Index of the Fisheries Sector Cluster Competitiveness – a tool for assessing the state fishing, aquaculture and fish processing competitiveness. The index reflects factors influencing the competitiveness of the fisheries sector at the level of microeconomics and macroeconomics (Fig. 2.).

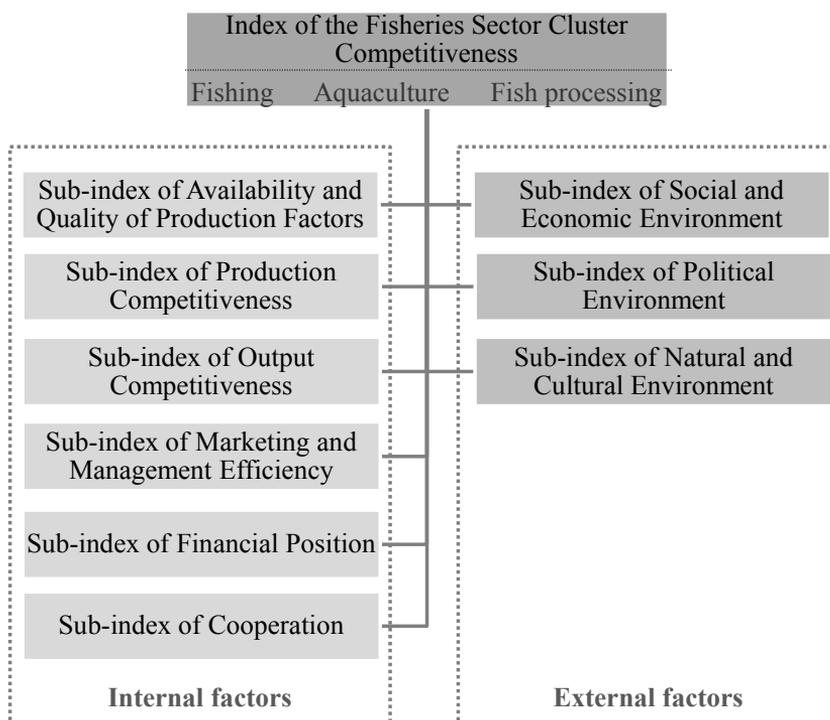


Fig. 2. Index of the Fisheries Sector Cluster Competitiveness framework (Source: author created)

The Sub-index of Availability and Quality of Production Factors, Sub-index of Production Competitiveness, Sub-index of Output Competitiveness, Sub-index of Marketing and Management Efficiency, Sub-index of Financial Position and Sub-index of Cooperation describe the development of fisheries sector at the level of microeconomics.

Any production process consists of the interaction of several production factors, namely: land, capital, labour and entrepreneurship. The Sub-index of Availability and Quality of Production Factors describes the production resources, available to the fisheries sector, and their quality, necessary for production development. In the framework of the sub-index it is possible to determine, which of the production factors obstructs and which facilitates the fisheries sector competitiveness. The production factors are restricted in relation to the requirements, consequently efficient use of these factors plays a significant role.

The Sub-index of Production Competitiveness describes the efficiency of

fisheries sector production resource use. The more efficiently and rationally the production resources are used, the more competitive is the production. Competitiveness of production is a significant factor, determining the potential of fisheries sector's development. However, not only the production competitiveness, but also the output competitiveness influences the competitiveness of the sector.

The Sub-index of Output Competitiveness reflects the competitiveness level of the produced goods and provided services in markets. A range of several factors influence the output competitiveness, they are: quality and assortment of the output, its price, warranty conditions, convenience of use, additional benefits, etc. However, just producing goods is not enough. To be able to facilitate the increase of output competitiveness, it is necessary to implement a well-advised and result-based system of marketing and management.

The Sub-index of Marketing and Management Efficiency reflects the results or "working fruits" achieved by the strategy implemented in the fisheries sector. It is possible to judge about the achieved results considering the indicators of the trade sector and their changes in time.

Availability and quality of production resources, competitiveness of production and output, as well as the results of the marketing and management activities all have a significant influence on the financial position of the fisheries sector, which in its turn plays an important role in the process of ensuring the competitiveness of the sector. The Sub-index of the Financial Position reflects the profitability level and efficiency of fisheries sector's activity. Moreover, further development and growth opportunities both depend on the financial position.

Cooperation plays an important role in facilitation of knowledge and experience exchange, which is one of the factors, influencing the competitiveness of the sector. As a result of cooperation the companies working in the sector can share the common information on the resources, necessary for the development of production process, peculiarities of production process, opportunities to increase the competitiveness of output, marketing and management strategies and plans, etc. The Sub-index of Cooperation reflects the awareness of community and inclination for a general benefit of the fisheries sector. It shows the unity of the sector and its interest in advancement of the common development and growth of the sector.

The Sub-index of Social and Economic Environment, the Sub-index of Political Environment, the Sub-index of Natural and Cultural Environment describe the development of fisheries sector at the level of macroeconomic development.

The Sub-index of Social and Economic Environment and the Sub-index of Political Environment reflect the influence of socioeconomic and political environment on the ensuring and facilitation of business in the fisheries sector.

Furthermore, the Sub-index of natural and Cultural Environment reflects the influence of natural and cultural environment (fishing restricted areas, diversity and protection of landscapes, fauna, species of animals and plants, climate changes, temperature changes, etc.) on the ensuring and facilitation the business in the fisheries sector.

All in all, the sub-indexes are not independent – they supplement and facilitate each other, consequently, they must be analysed complexly.

The Index of the Fisheries Sector Cluster Competitiveness does not offer a complex solution system for advancement of the competitiveness. It offers an opportunity to observe and analyse the development of the fisheries sector in the course of time, identifying the obstructing and facilitating factors. The Index of Competitiveness of the Fisheries Sector's Cluster can be used as a tool for assessment of the state fishing, aquaculture and fish processing competitiveness. The index may assist the institutions involved in the fisheries' policy formation to work more successfully and improve the common policy in the fisheries sector.

## **5. Conclusions**

The competitiveness of the sector is the ability to efficiently sell higher-quality output (goods and services) than the domestic and international competitors are able to do in the markets.

Competitiveness of the Fisheries Sector's the influence of various internal and external social, economical, political, natural and cultural environmental (including random events) factors and the ability to adapt them, cooperation, and formation of mutual interaction and cooperation forms and relationship among affiliated companies and support infrastructure sectors.

On the basis of a Model of Competitiveness of the Fisheries Sector's Cluster the author developed the Index of the Fisheries Sector Cluster Competitiveness, consisting of several sub-indexes: Sub-index of Availability and Quality of Production Factors, Sub-index of Production Competitiveness, Sub-index of Output Competitiveness, Sub-index of Marketing and Management Efficiency, Sub-index of Financial Position, Sub-index of Cooperation, Sub-index of Social and Economic Environment, Sub-index of Political Environment, Sub-index of Natural and Cultural Environment, and their relative weight. It provides an op-

portunity to observe and analyse the development of fisheries sector (fishing, aquaculture, fish processing) in the course of time, defining the factors obstructing and facilitating the competitiveness at the level of microeconomics and macroeconomics.

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