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BALANCE SCOREBOARD FOR SUSTAINABLE DEVELOPMENT IN THE RUSSIAN ARCTIC ZONE

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Abstract

This article carries out a comparative analysis of the modified structures of the classical system of balanced scorecards of domestic and foreign authors. The necessity of using the tool of balanced scorecards to manage the development strategy of socio-economic systems (SES) has been substantiated. This tool was the methodological basis of the research in the development of a system of indicators for assessing the sustainable development of socio-economic systems of the Arctic zone of the Russian Federation (shipbuilding cluster, Arkhangelsk region). Strategic maps have been developed for the Arkhangelsk region and the Cluster of Shipbuilding and Production of Marine Equipment of the Arkhangelsk region association, reflecting the main strategic objectives for the four perspectives (components). At the first stage of the process of forming a strategic map of the shipbuilding cluster, four adapted components were proposed: the financial component, the environmental component, the domestic and external market, and development and modernisation. Four additional adapted components for the Arkhangelsk region were proposed: the region's well-being, the ecological component, the economic component, learning and development. For each strategic goal, indicators were developed to assess the progress of achievement, based on which a balanced scorecard system was developed for the cluster and the region. This system reflects an interconnected set of indices of sustainable development for each level. These indices can be used to evaluate and monitor the results of the implementation of relevant strategies and to study the relationship between the sustainable development of the Arkhangelsk region and the activities of the Cluster of Shipbuilding and Production of Marine Equipment of the Arkhangelsk region association.

Keywords: balanced scorecard (BSC), modified BSC models, sustainable development, shipbuilding cluster, Arkhangelsk region, strategic map.

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ФОРМИРОВАНИЯ ИНДИКАТОРОВ УСТОЙЧИВОГО РАЗВИТИЯ СОЦИАЛЬНО-ЭКОНОМИЧЕСКИХ СИСТЕМ АРКТИЧЕСКОЙ ЗОНЫ РФ НА ОСНОВЕ СИСТЕМЫ СБАЛАНСИРОВАННЫХ ПОКАЗАТЕЛЕЙ

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Аннотация

В данной статье рассмотрены модифицированные структуры классической системы сбалансированных показателей отечественных и зарубежных авторов. Проведен сравнительный анализ данных концепций и моделей сбалансированных систем. Обоснована необходимость использования такого инструмента, как система сбалансированных показателей для управления стратегией развития социально-экономических систем. Данный инструмент явился методологической основой исследования при разработке системы индикаторов оценки устойчивого развития социально-экономических систем Арктической зоны РФ (судоостроительного кластера, Архангельской области). Для Архангельской области и ассоциации «Кластер судоостроения и производства морской техники Архангельской области» были разработаны стратегические карты, отражающие основные стратегические цели по четырем перспективам (составляющим). На первом этапе процесса формирования стратегической карты судоостроительного кластера были предложены четыре адаптированные составляющие: финансовая составляющая, экологическая составляющая, внутренний и внешний рынок, развитие и модернизация. Также были предложены четыре адаптированные составляющие для Архангельской области: благосостояние региона, экологическая составляющая, экономическая составляющая, обучение и развитие. Для каждой стратегической цели были разработаны индикаторы оценки прогресса в их достижении, на основе которых была разработана система сбалансированных показателей (ССП) для кластера и региона. ССП отражает взаимоувязанный набор показателей (индикаторов) устойчивого развития для каждого из уровней. Данные показатели (индикаторы) могут быть использованы для оценки и мониторинга результатов реализации соответствующих стратегий и исследования взаимосвязи устойчивого развития региона (Архангельская область) и деятельности ассоциации «Кластер судоостроения и производства морской техники Архангельской области».

Ключевые слова: сбалансированная система показателей (ССП), модифицированные модели ССП, устойчивое развитие, судоостроительный кластер, Архангельская область, стратегическая карта.

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Introduction

The world economy is characterised by a long and ongoing process of globalisation. Globalisation can be seen as both positive and negative. The need for global social, economic and environmental solutions has led to the development of the concept of sustainable development.¹

In the Russian Federation, the state policy of regional development currently aims at ensuring the sustainable socio-economic development of federal subjects of Russia.² Developed strategies for the socio-economic development of different regions of the Russian Federation include tasks such as ensuring sustainable economic growth, development of human capital, improving the quality of the urban environment, ensuring the efficiency of governance and development of civil society. In many regions of the Russian Federation, attempts are being made to integrate environmental and social aspects into the strategic management system. The sustainable development is the major prioritized line for the regional development government policy for the Arctic zone of the Russian Federation due to geopolitical and geoeconomic regional characteristics. At the same time, in the face of the permanent growth of global economic competition, states – especially those with emerging economies – have to develop more innovative, cost-effective, competitive forms of cooperation among economic agents with the active involvement of the research sector. As successful international practice shows, this kind of cooperation can be the unification of several stakeholders in the form of an industrial (or any other, depending on the objectives of the participants) cluster. The form of cluster cooperation as cooperation of several parties (industrial enterprises, suppliers, banks, investors, government bodies, scientific organisations) into one general formation achieves a cumulative synergistic effect through, among other things, savings on costs, as well as through mutual diffusion of unique knowledge, which, in turn, contributes to the differentiation of manufactured products and increase of the overall competitiveness.

Despite the positive effects of cluster creation, there is no universal procedure to assess and analyse the impact of cluster results on the sustainable development of a region. In order to carry out this analysis, it is necessary to identify the relationship between the main indicators of the cluster's performance and the level of sustainable development of the region. To identify this relationship, it is necessary to determine the indicators that could assess the effectiveness of the cluster and the level of sustainable development of the region. Typically, these figures are contained in relevant strategic documents, strategies or development programmes.^{3,4,5,6,7,8,9,10}

¹ Resolution adopted by the UN General Assembly on 25 September 2015 // Transforming Our World: Agenda for Sustainable Development until 2030. Available at: <http://www.un.org>

² On the approval of the Russian Federation's Innovation Development Strategy for the period up to 2020 // Order of the Government of the Russian Federation of 08.12.2011 N 2227-p // RLS. Available at: <http://www.consultant.ru>

³ The content, composition, procedure for the development and approval of the spatial development strategy of the Russian Federation, as well as the procedure for monitoring its implementation. 20 avgusta 2015 g. no. 870. Available at: <http://economy.gov.ru/minec/activity/sections/strategicPlanning/regulation/201511136>.

⁴ RF Presidential Decree of 01.04.1996 N 440 "On the Concept of the Transition of the Russian Federation to Sustainable Development". Available at: <http://www.consultant.ru/cons/cgi/online.cgi?req=doc&base=EXP&n=233558#04747149941947586>

⁵ Federal Law of June 28, 2014 N 172-FZ (as amended on December 31, 2017) "On strategic planning in the Russian Federation" Available at: http://www.consultant.ru/document/cons_doc_LAW_164841/

⁶ Order of the Government of the Russian Federation of November 17, 2008 N 1662-r (as amended on September 28, 2018) "On the Concept of long-term socio-economic development of the Russian Federation for the period until 2020." Available at: http://www.consultant.ru/document/cons_doc_LAW_82134

⁷ RF Presidential Decree of 07.05.2018 N 204 (as amended on 19.07.2018) "On the national goals and strategic objectives of development of the Russian Federation for the period until 2024". Available at: <http://kremlin.ru/acts/bank/43027>

⁸ Decree of the Russian Federation Government dated 21.04.2014 N 366 (as amended on 05.06.2019) "On the approval of the state programme "Socioeconomic development of the Arctic Zone of the Russian Federation". Available at: http://www.consultant.ru/document/cons_doc_LAW_162195/

At the heart of any strategy is strategic analysis and planning. Strategic planning and management are based on the principle of interconnectedness, the complexity of goals and objectives for sustainable socio-economic development. In other world, there is a need for consistency in the actions of government agencies at the regional and federal level, considering the characteristics and capabilities of individual territories.

In order to assess the quality of governance and effectiveness of the ongoing strategy for sustainable development of the Arctic zone of the Russian Federation, specific indicators should be formed, serving as the basis for representatives of different levels of state authorities to assess and monitor the economic, social and environmental situation in any SES (country, region, city, cluster, etc.). In the development and implementation of the cluster strategy, it is necessary to consider the relationship between key indicators of the cluster's performance and indicators of sustainable development of a particular territory of the Russian Federation. Thus, the relevance of the problem, its theoretical and practical significance determined the topic of the study, its purpose and objectives.

The goal of the work is to develop interconnected systems of indicators of sustainable development of the region and the industrial cluster based on the concept of balanced scorecards (BSC). To achieve the set goal, the following tasks were completed: the analysis of BSC as a tool for implementing the sustainable development strategy; the investigation of various BSC modifications; the selection of the best variant of possible prospects of BSC; the proposal of a system of indicators of sustainable development of the region and industrial cluster under investigation.

Literature review

To date, there is no single universal system of indicators of sustainable development assessment. Modern studies highlight two main approaches to constructing indicators and indices of sustainable development:

An indicator system evaluating three areas of sustainable development: environmental, economic, social^{11,12} (World Bank, 1997; Hassan, 2008).

A system of integral indices that assess the development of the territories comprehensively. These are divided into the following groups: A) socio-economic; B) environmental and economic; C) social and environmental; D) eco-socio-economic^{13,14,15} (Hassan, 2008; Ozkan and Schott, 2013; van Zeijl-Rozema et al., 2011)

⁹ Decree of the Russian Federation Government dated 21.04.2014 N 366 (as amended on 05.06.2019) "On the approval of the state programme "Socioeconomic development of the Arctic Zone of the Russian Federation". Available at: http://www.consultant.ru/document/cons_doc_LAW_162195/

¹⁰ President of Russia. Strategy for the development of the Arctic zone of the Russian Federation and ensuring national security for the period until 2020. Available at: http://www.minregion.ru/uploads/attachment/documents/2013/03/200313/200313_2.doc

¹¹ Indicators for Sustainable Development: guidelines and methodologies. Available at: <https://sustainabledevelopment.un.org>

¹² Sustainable Development Solutions Network. 2014. Why Sustainable Development Goals are Important. Framing Sustainable Development Goals, Targets, and Indicators. Prepared by the SDSN secretariat Issue Brief. Available at: <https://irp-cdn.multiscreensite.com/be6d1d56/files/uploaded/141120-Framing-Goals-Targets-and-Indicators.pdf>

¹³ Recommendations of the Conference of European Statisticians for Measuring Sustainable Development // United Nations Economic Commission for Europe: <http://www.cisstat.com14>

¹⁴ World development Indicators. 2017. World Bank. Washington DC. Available at: <http://data.worldbank.org>

¹⁵ SDG Index & Dashboards. A global report (full version). Available at: <http://www.sdgindex.org/>

Analysis of domestic and foreign literature has shown that, to date, there is no single theoretical-methodological approach for the management and evaluation of sustainable development of the territories, despite a large number of studies on sustainable development¹⁶ (Bell and Morse, 2008; Cornel L. and Mirela L., 2008; World Bank, 1997; Köppen et al., 2008; Loiseau et al., 2012; Mori and Christodoulou, 2012; Ozkan and Schott, 2013; Pope et al., 2004; Uskova, 2019; van Zeijl-Roze- ma et al., 2011). For example, Hassan (2008) proposed a method to assess sustainable development, based on an adapted multifactorial theory of usefulness. According to the author, this method explores the potential for improving the sustainable development of the region in the short and the long term (Hassan, 2008). Tarasova and Kruchina (2006) consider the close dependence of social well-being and the environment in the problems of human development in the Arctic. Skawińska and Zalewski (2009) proved by research that sustainable development is influenced by economic systems like clusters, which help regions to economically and socially develop. Papa et al. (2017) compared several development indices and conclude that the lack of reliable and structured statistics at the city or region levels creates problems in the development of indices needed to manage territories. Singh et al. (2009) note that the most developed indices do not use a comprehensive approach that would consider environmental, economic and social aspects. According to Kuosmanen et al. (2013), no studies reflect the relationship between the level of sustainable development of the company and the region.

This study will attempt to develop a system of indicators to assess the sustainability of the region and the industrial cluster based on BSC. The classical structure of BSC was proposed by Kaplan and Norton and became widely known around the world (Kaplan et al., 2004). The proposed classical structure of the BSC system indicates that an effective system of measurement of the activities of a modern company should include at least four perspectives: financial perspective, customer perspective, internal perspective, innovation and learning perspective.

The resulting interest in the strategy implementation system contributed to the formation of various domestic modifications of the classical BSC model (Akao, 2020; Andersen, 2007; Cornel L. and Mirela L., 2008; Derek et al., 2015; Gibson, 2015; Hassan, 2008; Kaplan et al., 2004; Mitskievich, 2004; Niven, 2015; Porter, 2000; Rampersad, 2003; van Zeijl-Rozema et al., 2011). Some BSC modifications and their features proposed by domestic economists are presented in Table 1.

As we can see in the matrix, the modified models consist of different components but some of them are repeated. Each model has distinctive features compared to the classical BSC. The “natural replacement” model does not specify the “learning and development” component, which is replaced by the “personnel” component. In the same system, the “marketing” component is more extensive compared to the classical BSC “customers” perspective. The model of the “Russian trinity” is convenient for the BSC owners, because finance forms its entire basis, and the company’s activities are divided into internal and external. A distinctive feature of the “innovation concentration” model is that the staff indicators are scattered across all four perspectives. In the “natural expansion”, the “external world” component considers a set of macroeconomic indicators (currency rates, inflation, consumer income, GDP growth, etc.), the social sphere, the environment and others. A feature of the domestic BSC version “extended classics” is that the section “marketing” includes information about consumers and competitors.

¹⁶ Department of Economic and Social Affairs Commission on Sustainable Development Ninth Session Division for Sustainable Development. 2011. Indicators of sustainable development: framework and methodologies – background paper no. 3. Available at: https://www.un.org/esa/sustdev/csd/csd9_indi_bp3.pdf

Table 1. Matrix of domestic BSC modified structures

№	Components	Names of modified models					
		Classic SSP model	Natural replacement	Russian Trinity	Innovative concentration	Natural expansion	Extended classics
1	finance	+	+	+	+	+	+
2	customers	+					
3	internal business processes	+	+	+	+	+	+
4	learning and development	+				+	
5	marketing		+		+	+	+
6	personnel		+			+	+
7	external world			+		+	+
8	innovation				+		+
9	products						+
10	suppliers						+

Source: Compiled works published by: Akao, 2020; Andersen, 2007; Cornel L. and Mirela L., 2008; Derek et al., 2015; Gibson, 2015; Hassan, 2008; Kaplan et al., 2004; Miscavige, 2004; Niven, 2015; Porter, 2000; Rampersad, 2003; van Zeijl-Rozema et al., 2011.

Most existing foreign models of balanced systems are modifications of the classical approach and differ in the methods or tools applied to achieve the main goals (Akao, 2020). These models include Lorenz Meisel's model, K. McNair's efficiency pyramid, the "control panel", Adams and Roberts' model (EP2M), the stakeholder model, the economic value added management system (Economic Value Added – EVA), the universal Hubert Rampersad performance system, the European Foundation for Quality Management (EFQM) model (Adams and Roberts, 1993; Akao, 2020; Andersen, 2007; Derek et al., 2015; Maisel, 1992; McNair et al., 1990; Mitskievich, 2004; Niven, 2015; Porter, 2000; Rampersad, 2003). All models share common ground with the classical BSC model, but at the same time differ in some components (Table 2).

As we can see in Table 2, the modified models proposed by both foreign and domestic economists have a number of distinctive features compared to the classical BSC model. Meisel's model uses the "human resources" component instead of "learning and development projection". The reason is that the management of the company should pay more attention to its staff and evaluate the effectiveness of employees. In the "efficiency pyramid", instead of the accepted four components, four levels representing the structure of the enterprise and the overall vision of the organisation are proposed. Within these levels, goals and directions of development and actions are highlighted. Unlike classical BSC, where key performance indicators cannot exceed the number fifteen, the "control panel" does not have there are no restrictions on indicators and objectives. Also, this model addresses only two of the components: "financial" and "internal business processes". The EP2M model includes four different components, but the purpose of this system is in line with the goals of BSC, namely, to ensure the implementation of the company's strategy and culture formation. The stakeholder model focuses on creating maximum added value for all stakeholder groups. Such a model does not represent integrated development and maintenance of the organisation's activities, nor does it have a clear structure and links between indicators. The EVA model can lead to short-term benefit-oriented decisions. The universal Hubert Rampersad performance system consists of five components, including a universal set of related indicators. Lastly, the EFQM model consists of nine criteria belonging to the opportunities and results (input criteria – leadership, policy & strategy, people, partnership & resources and processes; result criteria – customer results, employee results, society results and key performance results).

Table 2. Matrix of foreign BSC modified structures

№	Components	Names of modified models							
		Meisel's model	Efficiency pyramid	Control panel	Adams and Roberts' model (EP2M)	Stakeholder model	Economic value-added management system (EVA)	Universal Hubert Rampersad performance system	European Foundation for Quality Management (EFQM) model
1	human resources / people	+							+
2	financial	+	+	+		+	+		+
3	internal business processes	+		+					+
4	customer and market service		+		+				+
5	improving internal processes				+				
6	policy & strategy				+				+
7	property and freedom of action				+				
8	personal BSC							+	
9	organisational BSC							+	
10	universal quality management							+	
11	management / leadership							+	+
12	Kolb's learning cycle							+	
13	personnel training and development	+							+
14	society								+
15	partnership / internal resources								+

Source: Compiled works published by: Adams and Roberts, 1993; Akao, 2020; Andersen, 2008; Derek et al., 2015; Maisel, 1992; McNair et al., 1990; Mitskievich, 2004; Niven, 2015; Porter, 2000; Rampersad, 2003.

As a result of the research, we can say that most of the existing BSC modifications are inferior to the classical BSC, in different ways. Some of these (e.g., EVA, Stakeholder model, “control panel”) propose a divergence from the four original BSC projections (Adams and Roberts, 1993; Akao, 2020; Andersen, 2007; Derek et al., 2015; Maisel, 1992; McNair et al., 1990; Mitskievich, 2004; Niven, 2015; Porter, 2000; Rampersad, 2003). The Meisel model and the EP2M model include four projections like the BSC ones, but using other names (Adams and Roberts, 1993; Maisel, 1992). However, the EP2M model is focused not only on the development and implementation of the company's strat-

egy but also on the formation of culture. The Meisel model uses a separate perspective of “human resources” as the management evaluates the effectiveness of not only processes but also people. The universal Hubert Rampersad performance system was developed on the basis of Kaplan and Norton’s BSC; however, it is quite large-scale and costly in terms of implementation. Consequently, not all organisations are ready to use the system in its current form. The EFQM model includes two types of criteria: “opportunities” and “results”. The “opportunities” reflect how organisations operate as pathways and means or potential factors. The “results” include the achievements of the organisation. Each criterion is divided into components, including a number of issues that need to be discussed to assess performance. The introduction of such a model leads to the expansion of classical BSC through additional criteria (Adams and Roberts, 1993; Maisel, 1992; McNair et al., 1990; Mitskievich, 2004).

Materials and methods

The methodological basis of this study is the BSC model proposed by Kaplan and Norton (Kaplan et al., 2004). The classical structure of BSC, if adapted, allows exploring the issues related to the development and implementation at different levels, including aligning the indicator system with the company’s or other structures’ (e.g., cluster, region) goals and strategy which contributes to the sustainable development of the latter.

A cascading method was used to build a model of causality. The cascading method is based on the principle of harmonizing the objectives of all levels of economic systems and the successful implementation of the sustainable development strategy (Kaplan et al., 2004). Based on this method and by defining strategic goals and indicators, the systems of indicators of the lower and upper levels are aligned. In this study, the BSC adapted for regional specifics was the tool for the formation of indicators that assess the sustainable development of the territories for each of the four projections: the well-being of the region, environmental, economic, learning and development, innovation (Table 4). Similarly, the classical BSC adapted to the characteristics of cluster formations was the tool for the formation of indicators to assess the sustainable development of a cluster in four projections: financial, environmental, domestic and external markets, development and modernisation (Table 3).

Table 3 Adaptation of BSC components to the cluster

Components of classical BSC	Components of the cluster-adapted BSC
Financial component	Financial component
Customer component	Environmental component
Internal business processes	Domestic and external markets
Learning and development	Development and modernisation

Source: Compiled by the author of the present study.

Table 4 Adaptation of the company’s components to the region

Components of classical BSC	Components of the region-adapted BSC
Financial component	The well-being of the region
Customer component	Environmental component
Internal business processes	Economic component
Learning and development	Learning and development, innovation

Source: Compiled by the author of the present study.

The main advantage of the proposed approach is that it links the sustainable development strategies of individual enterprises or other socio-economic subsystems in the region to the overall strategy for sustainable development of the region and, then, translates each strategy into a specific bottom-up action sequence aimed at achieving the goals at all management levels.

In this way, BSC allows for the formation of an interconnected set of sustainable development indicators for each level to assess the results of an overall sustainable development strategy. The indicators highlighted in the process of the formation of BSC allow not only to assess the achievement of the results of the strategy but also to further model the various relationships within the region, including the impact of the cluster's activities on the regional development.

Results

In order to propose a tool that assesses the impact of the industrial cluster on the development of the region, the classical BSC model was adapted following existing regional development programmes.^{9,10} The Arkhangelsk Region and Cluster of Shipbuilding and Production of Marine Equipment of the Arkhangelsk region association (hereinafter, the shipbuilding cluster) were selected as the subjects of this study. At the first stage of forming a strategic map of the shipbuilding cluster, four adapted components were proposed: financial component, environmental component, internal and external market, development and modernisation (Table 3).

Four adapted components for the Arkhangelsk region were also proposed: the well-being of the region, environmental, economic, learning and development, innovation. (Table 4).

Further, strategic maps were developed for the Shipbuilding cluster and the Arkhangelsk region, followed by the determination of strategic development goals and key indicators for their assessment (Figures 1 and 2).

Strategic maps are interconnected with the objectives of the shipbuilding cluster and the Arkhangelsk region. This is a condition that is mandatory to benefit from the implementation of BSC. The interconnection between the cluster and the region is implemented using the cascading method (Kaplan et al., 2004). The proposed strategic maps allow to link the strategic goals of economic systems of different levels (cluster and region) and illustrate the causal relationship between them, as well as assess the degree of achievement of the goals, based on a set of developed indicators. For example, consider one of the projections of the shipbuilding cluster and the region: "domestic and external market" and "economic component" respectively. For example, consider one of the projections of the shipbuilding cluster and the region: "Internal and external markets" and "Economic component", respectively. These two goals are linked by key assessment indicators. For example, the indicator "number of foreign companies involved in the cluster" can influence the "investment in fixed capital" of the region and contribute to achieving one of the goals of the development of the region, by increasing the investment attractiveness.

Depending on the indicators in the proposed system change, it will be possible to assess the trends in the Arkhangelsk region and identify factors contributing to or hindering the sustainable development of the region.

⁹ On the approval of the programme for the development of the shipbuilding innovative territorial cluster of the Arkhangelsk region for 2014-2017 (with changes from July 28, 2015). The resolution of the Government of the Arkhangelsk Region of October 7, 2014 N 390-pp "Electronic resource." Available at: <http://docs.cntd.ru>

¹⁰ On the approval of the Russian Federation's Innovation Development Strategy for the period up to 2020. Order of the Government of the Russian Federation dated 08.12.2011 N 2227-p // RLS Consultant Plus.

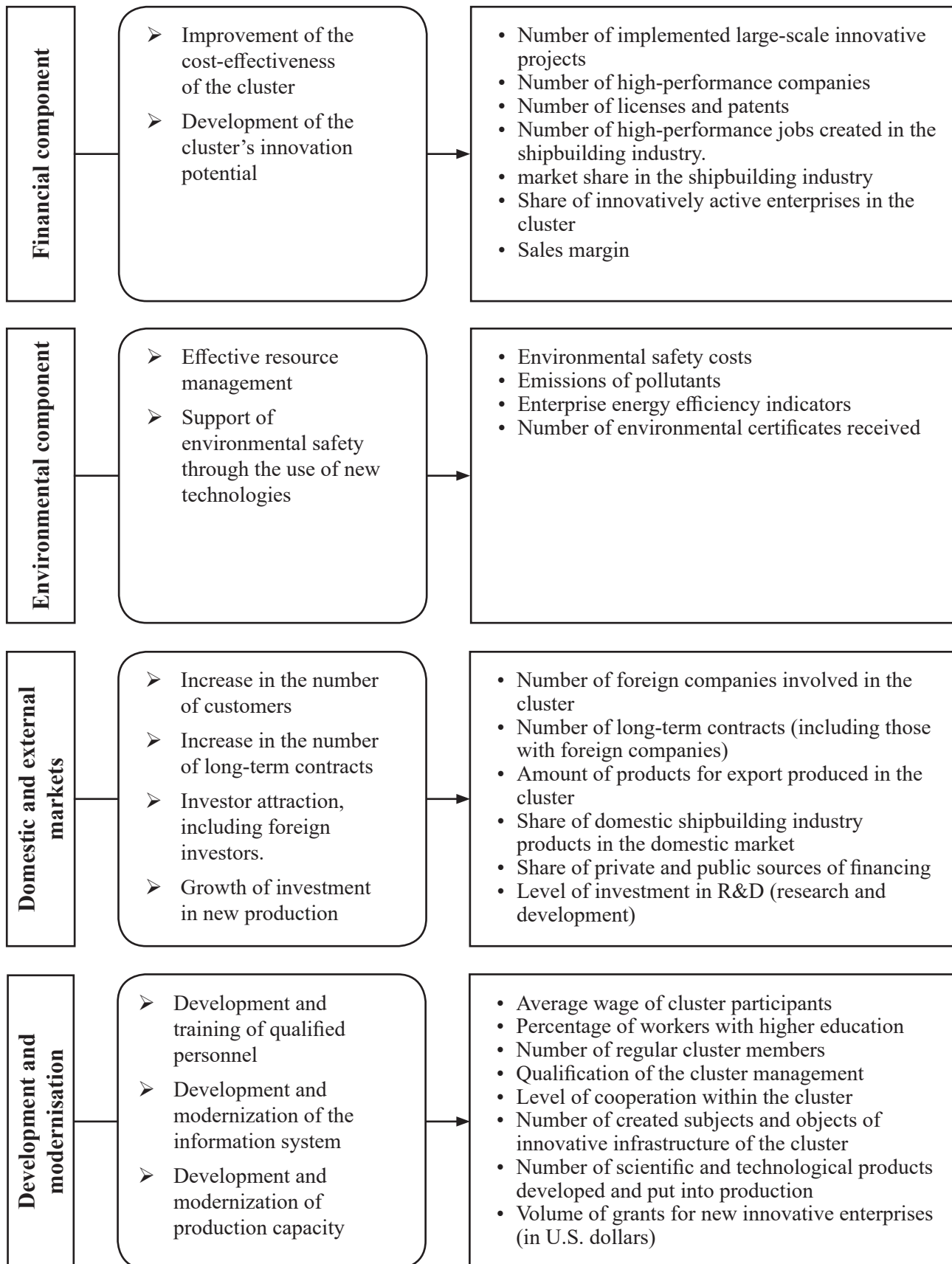


Figure 1. Strategic map of sustainable development of the cluster.

Source: Compiled by the author of the present study.

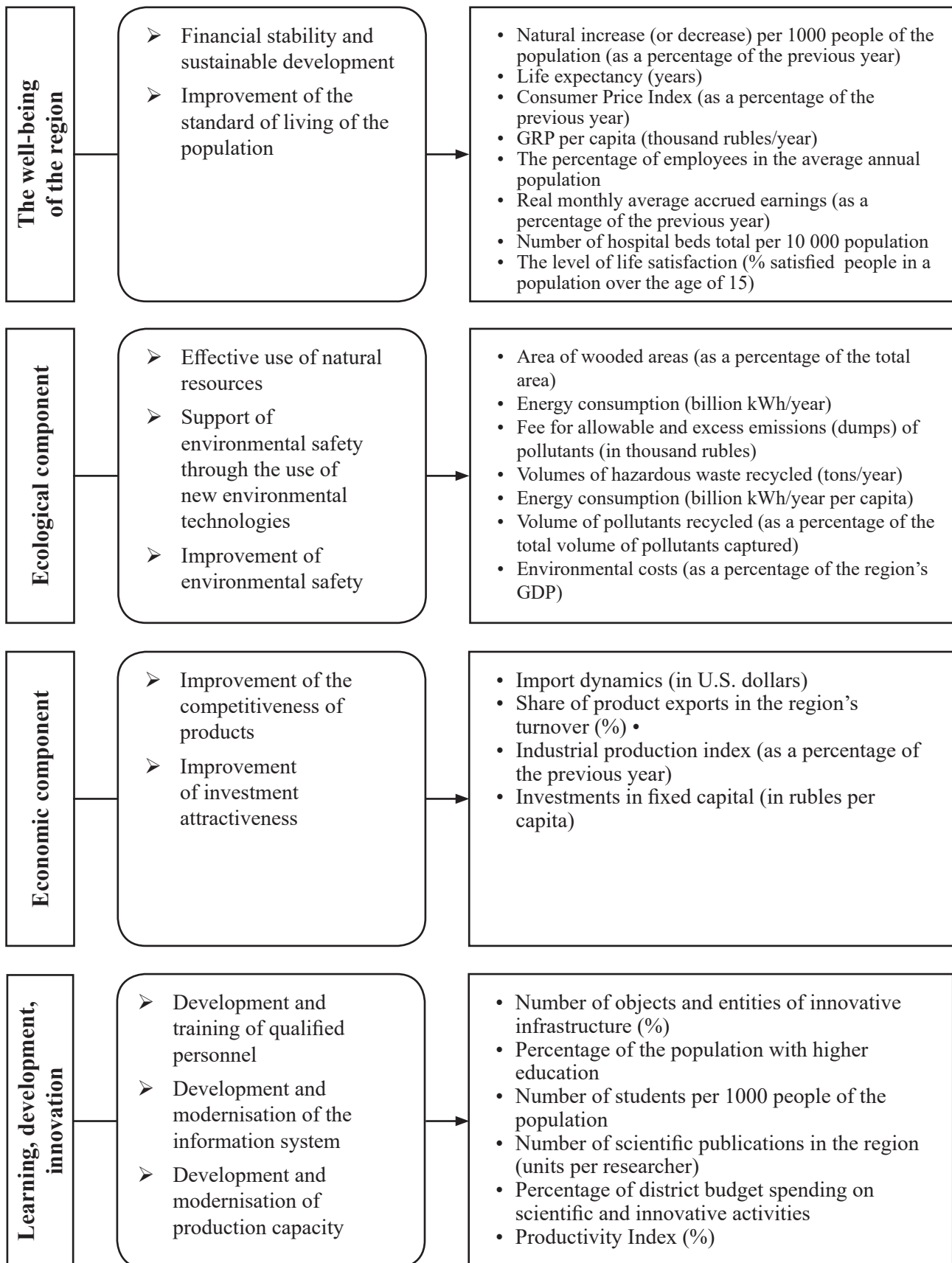


Figure 2. Strategic map of sustainable development of the Arkhangelsk region.

Source: Compiled by the author of the present study.

Conclusion

As a result of the study of the concept of sustainable development, analysis of literature and reports of international organizations, the author concludes that sustainable development includes the triunity of social, economic and environmental development of territorial socio-economic systems. At the current stage of development of the world community, it is necessary to ensure the comprehensive development of all management levels. This study focuses on industry (cluster) and regional level, their relationship and the main indicators that will reflect the impact of the shipbuilding cluster on the development of the Arkhangelsk region where it operates.

As part of this study, BSC was adapted to build an indicator system that reflects the relationship between cluster activity and sustainable development in the region. As a result, indicators of the assessment of the sustainable development of the actors in question were identified. Specifically, the components of BSC were adapted and strategic development maps were formed for the shipbuilding cluster of the Arkhangelsk region, within which indicators of the region's development assessment and cluster were proposed for each strategic goal. Based on the developed indices, it is possible to regularly monitor the implemented strategic alternatives and to exert regulatory influences for the sustainable development of both the shipbuilding cluster and the Arkhangelsk region. Depending on how the indicators in the system change, it will be possible to assess the trends in the territories and identify factors contributing to or hindering sustainable development. This will contribute to the identification of priorities and the most suitable tools for the sustainable development of both the cluster and region. The indicators will not only allow to assess the achievement of the strategy but also model the relationships within the region, including the impact of the cluster's activities on regional development.

The approach discussed in this article opens up opportunities for further discussions on managing the sustainable development of the region. The limitations of the present article and the lack of the necessary empirical data from open sources make the proposed indicator system a theoretical basis for future research. To implement this approach and to effectively use the adapted BSC model, these indices must be introduced into the statistical accounting system in practice, making it possible to continue the study and confirmation or rejection of the projected relationship between the region's development and the cluster based on empirical data.

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