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ENVIRONMENTAL AND ECONOMIC RISKS IN ESTIMATING INVESTMENT POTENTIAL OF COASTAL AREAS OF THE SOUTH OF RUSSIA

Abstract: *The authors reason the necessity of moving beyond the methodology of geo-ecological planning in assessing coastal areas investment potential and developing the system of technics enabling to take into consideration environmental and economic risks as well as industry specifics of the realized project. The paper represents the authors' toolware enabling to assess the influence of separate kinds of environmental and economic risks on every component of investment potential of the region; it includes the appraisal of the application of the proposed toolware in coastal areas of the Azov Sea and the Low Don of the South of Russia demonstrating its usefulness for regional management. The author's system of technics enabled: to identify risks of project realization in the sphere of developing tourist and recreational complex on the territories under examination; to estimate the level of significance of environmental and economic risk for every component of the area's investment potential.*

Keywords: *Costal areas; Sustainability of development; Region; Investment potential; Environmental and economic risks; The South of Russia.*

1. Introduction

Coastal areas are complex and multifunctional systems and subject to strong complex influence of the whole combination of natural and climatic, social and economic factors. These territories have high value status from the perspective of providing environmental security that determines the necessity of close attention to the issues of their rational usage, reasonability and ability of allocating these or those industries of national economy within these areas. At that the coastal areas appear at the intersection of multiple often conflicting social and economic interests of a great number of diverse subjects that leads to a number of problems in managing their investment potential.

According to the existing methodology of geo-ecological planning the choice of investment sites is made with consideration of environmental constraints and possible consequences of project realization influencing regional ecosystem. For instance, one of the most important stages in industrial design is estimating risks of abnormal emergency situations, floods, fires occurring as well as forecasting consequences of these situations and developing the system of preventive and recovery measures (Security manual, 2016).

In this paper the authors highlight that natural disasters and other objective factors connected with changes in the state of water objects can cause catastrophic loss not only in ecosystem but as well in the whole economic system of the region determining

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both environmental and ecological and economic risks. The existing methods estimating coastal areas investment potential often fail to take these risks into consideration.

Meanwhile it is rather important for the regional policy to give adequate estimation of coastal areas investment potential taking into account specific factors of environmental and economic risks typical for coastal zone and it can be done by means of ecosystem approach. The goal of this paper is to determine the necessity of moving beyond the methodology of geo-ecological planning estimating investment potential of coastal areas and developing the system of technics enabling besides environmental risks to take into account ecological and economic risks. The object of the research is represented by coastal areas of the Azov Sea and the Low Don of the South of Russia, and the proposed system of technics has been tested on the basis of the massive of data of Economic Statistics accessible for the researchers and experts.

2. Literature review

Russian and foreign scientific researchers have been paying attention to the issues of managing the development of coastal areas for many years. Some publications devoted to considering water spaces impact on coastal population life and activity date back to the 19th century. The most popular among them is the work «Civilization and Great Historic Rivers» by L. I. Mechnikoff (Metchnikoff, 1889). In publications of that period focused attention is paid to the issues of exploring coastal areas, studying the role of water spaces in developing civilization and determining the character of territorial arrangement of the economy.

In spite of some mentioning of the fact that solving tasks of environmental, economic and social rationalization of coastal areas requires taking into consideration factors of coastal zone their complex studying started only in the middle of the 20th century. It found its reflection Resolutions of the UN International Conference on Environmental Protection and Sustainable Development which was held in Rio-de-Janeiro in 1992 as well as in a number of documents issued by the initiative of the European Commission: "Code of Behaviour in Coastal Area", "Coastal Zone Model Act" (EU focus, 2000; European code, 2013). Later strengthening of the processes of further economic development of coastal areas gave the priority to the issues of forming the system of managing their effective development in many programs financed by EU.

In Russia one of the first scientists who highlighted the coastal area as the special space of interaction of land and water objects where the human and the nature interact especially intensively was V. I. Lymarev, the founder and creator of the scientific direction «Coastal Studies» (Lymarev, 1986; Lymarev 2000). The results of his researches have been reflected in many publications including the series of manuscripts "Key concepts of contemporary coastal management" (Key concepts of contemporary coastal …, 2009–2011), where the special attention is paid to researching impact of natural and anthropogenic factors on coastal ecosystems' development.

Coastal areas play a significant part in the economy of Russian regions. However, in spite of their high environmental and economic value there is no concept "coastal area" in Russian legislation. In the act "On State Land Cadastre" the term "territorial zone" is used which implies the territory characterized by a special legal regime of using land parcels" (Act of the Russian Federation No. 28, 2000). In the Water Code of the Russian Federation there is a concept "water conservation zone" defining land component of coastal territory, i.e. the territory adjacent to the contours of the water object (seas, rivers, lakes, water reservoirs and etc.) and which has special regime of economic activity (Water Code of the Russian Federation, 2006). Using the

term “coastal area” in scientific publications researchers as a rule refer to the UNEP Guidelines (Guidelines for Integrated …, 1995).

According to this document the coastal area is the part of land and sea being in strong direct interaction. The coastal area is considered as an object of managing economic, social and economic and any other kind of activity.

In the authors’ perspective the coastal territory should be understood not only as the territory connected to the sea but as well to large rivers, lakes and reservoirs. This is due to the fact that above-mentioned objects are important components of investment projecting determining developmental attractiveness of the area for these or those industries and spheres of activity. Water objects can have the following impact on investment potential of coastal areas:

- influencing regional economic complex – opportunities and conditions of developing water-intensive industries including agriculture and pond-culture;
- influencing power potential of the region – opportunities and parameters of developing power infrastructure of the region by means of constructing water and power objects as well as establishing small power stations;
- influencing touristic and recreational potential of the region – opportunities and conditions for developing touristic business, creating sanatorium and health-resort zones and recreational areas;
- influencing communal sphere of the region – providing water resources including fresh water for localities.

It can be affirmed that usefulness and attractiveness of the coastal area for investors is determined by the opportunity to realize the following kinds of activity:

- life-supporting kinds of activity related to providing population with water, foodstuffs, power;
- social kinds of activity – housing construction, touristic and recreational business;
- entrepreneurial activity in the sphere of fishery, transport, industrial production, providing different services;
- social and environmental activity connected with purifying water resources, fulfilling of engineering and technical functions and etc.

However, along with opportunities determined by presence of water objects in the area coastal areas have related environmental and economic risks which are understood by the authors as probability of social and economic losses in the economy of the region as a result of disrupting the balance of the coastal ecosystem as a result of technogenic influence of the environment as well as natural disasters. Thus, development of coastal area investment potential requires a special approach.

Coastal areas have a significant economic meaning in the economy of Russian regions. However, they were not included in strategies of regional development of Russia. The certain step in considering coastal regions as the specific sphere of regional management was working out “Methodical recommendations to working out coastal-marine component of the Strategy of social and economic development of a seashore subject of the Russian Federation” (Methodical recommendations to working …, 2013). However, these recommendations touch upon the issues of developing seashore zone. Whereas the specifics of environmental and economic interactions of coastal areas as it was highlighted earlier is typical to other water objects (such as large rivers, lakes, water reservoirs and etc.) significantly influencing realization of investment potential.

Escalation of problems related to technogenic transformation of coastal zones demanded solving the issues of providing balance between economic growth and environmental safety. It gave rise to multiple researches devoted to interdetermination and interdependence of natural processes and processes of social and economic development. In contemporary researches the problems and perspectives of coastal areas developing are considered not only from the perspective of physical and geographical, natural and landscape, infrastructural and demographic indices but as well in the context of their investment attractiveness. However, consideration of the issues of social and economic development of coastal areas is restricted by the frames of methodology of geo-ecological planning. In researching the problems of forming and developing coastal area investment potential the emphasis is made on the necessity of maintaining the balance of natural and anthropogenic components of urban landscape.

The carried out analysis of contemporary researches devoted to working out methods of assessing investment potential of the territory showed that these researches focus on the following key issues:

- determining factor components of investment activity (Asaul, Posyada, 2008; Bereznev, Sheveleva, Nacheva, 2011; Mitin, Voronin, Donnik, 2018; Okruashvili, Metonidze, 2017);
- revealing the impact of different risks on the level of area's investment attractiveness (Klimova, 2003; Gratsinskaya, Puchkov, 2008, Revunov, Revunov, 2018; Bacsosz, 2019; Mitrofanova, 2019; Mitrofanova, Chernova, Pyankova, Batmanova, 2020);
- developing mechanisms of settling conflicts of interests of different actors (population, investors, social organizations and etc.), appearing in the influence zone of the realized project (Jugovic, 2012; Melikh, Voit, Archybisova, 2019; Khovavko, 2018, Oborin, Mitrofanova, 2018).

Generally in all researches investment potential of the area is considered as an aggregate characteristic of the combination of social, economic, organizational, legal, political, social and cultural prerequisites predetermining entrepreneurial interest and reasonability of investing in this or that economic system (economy of a country, region, corporation) (Chainikova, 2008). At that while assessing area's investment potential its coastal location is not considered as the factor determining specific risks of investment projects realization that has become a serious research problem. Risk component in the methods of assessing is used for assessing the probability of income deficiency due to ecological problems. Besides the existing methods don't take into consideration the fact that investment projects of some industries can differ by the level of structural complexity as well as character of interaction with the environment that in combination determine industrial specifics of occurring environmental and economic risks.

In practice of regional strategizing in Russia Methodical approach of the Ministry of Economic Development of RF and The Russian Academy of Science (Investment climate of regions …, 1997) as well as methodical approach of the agency "Expert-RA" (Methodical approach to investment …, 2015). These methodical approaches don't take into account risks occurring as a result of disrupting the balance of functioning of economic and environmental subsystems of the region. In world practice researchers use methodical approaches of assessing investment potential of the region aimed at creating a rating of investment attractiveness of the territory. As a rule these methodical approaches base on information about credit history but don't take into account national and regional specifics.

Characteristics of the most popular sets of methods of assessing investment potential of the region are presented in Table 1.

Table 1. Set of Methods of assessing investment potential of the region

Methodical approach	Applied assessment indices	Peculiarities of methodical approach	Methodical approach
Methodical approach of the Ministry of Economic Development of RF and the Russian Academy of Science	Investment attractiveness, investment activity	Takes into account factor and resulting indices of investment processes without consideration of risks of investment activity	Methodical approach of the Ministry of Economic Development of RF and the Russian Academy of Science
Methodical approach of the agency "Expert-RA"	Innovation potential, integral investment risk	The main emphasis is made on assessing opportunities of investment development and significance of the problems that can appear in this region as a result of financial, social, managerial, economic, environmental and criminal risks	Methodical approach of the agency "Expert-RA"
Methodical approach of Harvard School of Business (Stobaugh, 1969)	Regulatory and legal framework of investment processes; state of national currency, the level of inflation, political situation in the country	It is used for characterizing (rating) purposes of national economies; doesn't take into account regional specifics of factors and conditions	Methodical approach of Harvard School of Business (Stobaugh, 1969)
Methodical approach of Credit rating agency Moody`s; Methodical approach of "Standard & Poor's"	risks: general economic risks, financial, trade, connected with managing local budgets and etc.	Assesses the state of local finances and regional budget; takes into account only credit risks and financial potential of the region,	Methodical approach of Credit rating agency Moody`s; Methodical approach of "Standard & Poor's"
Methodical approach of economic department of the Bank of Austria	Indices assessing political, economic and social situation in the region	Restricted range of factors: environmental factors are not taken into consideration	Methodical approach of economic department of the Bank of Austria

Source: results of own research

Thus it is obvious that there is a gap in considering specifics of realizing investment projects in coastal areas. To the authors' point of view this offence of omission can be reduced by means of ecosystem approach to developing the set of methods of assessing coastal area investment potential. In this paper we will try to form this set of methods

3. Methodology and Method

Having analyzed the practice of assessing coastal areas investment potential and having made the review of scientific literature related to this issue the authors come down to the conclusion that insufficient attention or even ignoring environmental and economic risk factors of realizing investment project can provoke possible negative consequences leading to disbalance in interaction between society and

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nature. However, realization of investment projects in the coastal areas can have social and economic as well as environmental consequences directly influencing the level of competitiveness of the area and quality of life of the population. Application of ecosystem approach to the assessing of the coastal area investment potential enables not only to determine economic reasonability of project realization but as well to determine the level of economic and environmental risks that on the one hand caused by the project itself, but on the other hand reflect the sensibility of the project to specific factors and conditions determined by coastal location.

Ecosystem approach to the assessing of the coastal area investment potential enables:

- to focus attention on the factors related to anthropogenic and technogenic transformations of coastal zones which lead to environmental and economic risks;
- to pay attention to the role of investors as key actors of maintaining ecosystem in "healthy" state;
- to actualize the model of business interaction of the investor with the environment.

The authors' methodical approach to assessing coastal area investment potential develops the methodical approach worked out by the rating agency "Expert" by means of adjusting the values of regional investment components to the value of environmental and economic risks related to the realization of the project. Ecological and economic risks give rise to negative multiplicative effect in the whole regional system. Their size and content depend on economic sphere of project realization. Thus, for instance, the risk of coastal area take-over by megalopolises in case of establishing a metallurgical plant will be higher than in case of realization of the project of creating recreation park. That is why the important peculiarity of the authors' approach is that assessment of investment potential of the area must be made through industrial dimension, i.e. in the view of reasonability of project realization in a particular economic sphere.

The comparison of the authors' methodical approach with the most popular methodical approaches of assessing investment potential is presented in the Table 2.

The authors' methodical approach to assessing coastal area investment potential is an adaptation of the methodical approach worked out by the rating agency "Expert-RA" by means of adjusting the value of regional investment potential to the factors of environmental and economic risks related to the realization of the investment project in a particular industry. At that by environmental and economic risk the authors imply the probability of social and economic losses in the economy of the region as a result of disrupting the balance of the coastal ecosystem caused by technogenic impact on environment as well as natural disasters.

The kinds of environmental and economic risk as well as rates of its weight values for every component of investment potential of coastal areas are determined by experts. Choosing indices the experts should follow the principles of requisite variety, minimal sufficiency, and targeting of the system elements that enables to choose a number of factors from myriad. The total of the weight values of every kind of risk is to make up unity. As the method of making decisions the experts are supposed to use commission method that implies open discussing of the problem under consideration and obtaining resultant opinion. The main advantage of this method is increasing experts' awareness in discussion.

Table 2. Comparison of methodical approaches to assessing investment potential of the region

Methodical approach	**Comparison Criteria**				
	Used approaches	**Risk consideration**	**Environmental factors consideration**	**Social factors consideration**	**Industry factors consideration**
Methodical approach of the Ministry of Economic Development of RF and the Russian Academy of Science	Resultative	No	No	Yes	No
Methodical approach of the agency "Expert-RA"	Rating, Resource	Takes into consideration integral investment risk	As a factor of environmental risk	As a factor of social risk	No
Methodical approach of Harvard School of Business (Stobaugh, 1969)	Rating, Factor	No	No	No	No
Methodical approach of Credit rating agency Moody`s; Methodical approach of "Standard & Poor's"	Rating, Resource	Takes into consideration only credit risk	No	No	No
Methodical approach of economic department of the Bank of Austria	Factor	No	No	No	No
Authors' methodical approach to assessing coastal area investment potential taking into consideration environmental and economic risk	*Ecosystem, Industrial*	*Takes into consideration environmental and economic risks*	*Takes into consideration ecological consequences of realizing the project as well as the impact of environmental factors on the project*	*Takes into consideration social and economic consequences influencing the quality of life of the population*	*Yes*

Source: results of own research

The components of investment potential are determined by means of methodical approach of the Rating agency "Expert RA". The indices characterizing the value of every component of investment potential of the region are determined on the basis of official data provided by Rosstat, territorial statistical authorities as well as official reports of regional governmental bodies. The indices are chosen by the experts taking into consideration industrial specifics of the investment project under consideration.

Factors determining investment potential of the coastal areas of the Azov sea and the Low Don for each component (for comparison purposes) are numbered at maximum rating of the similar indices in regions of the South of Russia, i.e. the value of every component index of investment potential can be calculated by the formula 1:

$$p = \frac{p_c}{p_{max}} * 100$$

where p is the calculated component index of investment potential;
p_c – the value of the component index in the estimated region;
p_{max} – maximum value of investment potential component among regions of the South of Russia.

Integral value of investment potential factors is calculated as weighted average (taking into consideration the weight of every factor for developing touristic and recreational sphere in the coastal area, for. 2):

$$I = \frac{\sum_{j=1}^{n} p_{i,j}}{n_i} * d_i$$

where I – an integral factor value of investment potential;
n – the number of indicators of investment potential component;
$p_{i,j}$ – j-indicator of i-component of investment potential;
d_i – the weight of i-component of investment potential.

Obtained rates of integral values of I are adjusted to the value of factors of environmental and economic risk (for. 3):

$$I_{kor} = I * \gamma$$

Where I_{kor} is an integral value of the corresponding component of the investment potential of the region adjusted to the factors of environmental and economic risk;
γ – weight value of the corresponding kind of environmental and economic risk.

The obtained adjusted rates of integral values is used as the basis for creating the profile of environmental and economic risks of realizing investment potential of the area enabling to find out the most significant risks for the project under consideration.

4. Results

The object of this research is the coastal areas of the Azov Sea and the Low Don in Rostov Region which were includes in a special zone specializing in medical recreation, health improving and cognitive tourism (Main provisions of territorial planning …, 2019) within territorial planning in 2008. The authors are challenged to identify environmental and economic risks appearing in realizing the project in the sphere of development of touristic and recreational complex and to adjust the value of the investment potential of these areas to these risks.

5 experts (3 representatives of Russian Information-Analytic and Research Water Economy Centre and 2 representatives of Federal Research Centre the Southern Scientific Centre of the Russian Academy of Sciences (SSC RAS)) were involved in qualitative assessment of existing environmental and economic risks of realizing investment potential of the above-mentioned areas. This quantity of experts meets the requirement of serious reasoning of decision making process (Ruposov, 2015).

The factors forming area's investment potential as well as kinds of environmental and economic risks and their weight values were identified in the process of open discussion resulting in general consensus on every issue under consideration. The experts were offered to identify the most significant environmental and economic risks in the view of realizing projects of developing touristic and recreation complex in the coastal areas of the Azov Sea and the Low Don. For this purpose they were offered to discuss the following issues:

- If there is any probability of take-over of potential recreational coastal areas by big cities?

- If there is any transport accessibility to coastal areas of the region? If there are any problems related to its increasing determined by the specific ground features?
- If coastal areas have sufficient engineering and technical conditions to prevent negative processes caused by deterioration of water objects?
- If economic objects polluting the environment will appear in the coastal area?

As the result of the discussion the experts have come down to the conclusion that the realization of the projects in tourist and recreative sphere in the coastal areas can lead to the following environmental and economic risks:

- Urbanization risk – the probability of potential recreational coastal areas by megalopolises;
- Infrastructure risk – the probability of the failure of transporting system;
- Engineering and technical risk – the probability of flooding of the coastal areas, landslide, swamping;
- Anthropogenic risk – the probability of polluting the environment caused by constructing touristic and recreation objects.

Besides the experts determined weight values of these risks for every component of investment potential of the coastal area of the Azov Sea and the Low Don. They were offered to fill in the table of weight values in the manner that the sum of weight values of every kind of risk equals the unity. The list of components of investment potential was determined in conformity with methodical approach developed by the Rating agency "Expert RA". The results are presented in the Table 3.

Table 3. Weigh values of environmental and economic risks for components of coastal areas' investment potential of the Azov Sea and the Low Don

Components of investment potential	*Weight values of environmental and economic risks for components of investment potential*			
	Urbanization risk	*Infrastructure risk*	*Engineering and technical risk*	*Anthropogenic risk*
Nature and resource potential	0,3	0,05	0,2	0,3
Production potential	0,1	0,2	0,2	0,1
Labour potential	0,1	0,05	0,05	0,1
Consumer potential	0,1	0,2	0,2	0,2
Infrastructure potential	0,1	0,3	0,1	0,05
Financial potential	0,1	0,05	0,1	0,1
Institutional potential	0,1	0,05	0,05	0,05
Innovation potential	0,1	0,1	0,1	0,1

Source: results of own research

At the next stage the experts were offered to identify the list of indices for assessing some components of investment potential of the area and to fix weight values of these components taking into consideration their importance for the development of the touristic and recreational complex. For providing objective assessment the given indices should be formed on the basis of the data of official statistics as well as data of official reports and analytical materials of regional authorities. The indices chosen for assessment are represented in Table 4. This table also contains real values of indices for Rostov Region (p_c) and maximal values of these indices among regions of the South

Federal Region (p_{max}). Indicator value p is found using formula (1). The integral value of the indicator I is found using the formula (2).

Table 4. Factors determining investment potential of development of the coastal areas of the Azov sea and the Low Don river of the South of Russia

Factors	*Weight*	*Indices*	*PO*	*MAX*	*Values of indices*	Integral value
Natural and resource	0,25	Relative share of coastal areas suitable for developing touristic and recreational sphere	0,5	0,7	71	18,25
		Withdrawal of water from natural water objects for purposes of developing touristic and recreational sphere, million cubic meters	1745	2250	78	
		Expert assessment of natural and climatic potential for purposes of developing touristic and recreational sphere, points	7	10	70	
Production	0,1	Amount of touristic services rendered per capita, rubles	78500	205260	38	3,05
		The number of enterprises and organizations in the sphere of tourism per 10000 persons, items.	132	570	23	
Labour	0,1	Relative share of population engaged in touristic business, thousand persons	10,4	35,7	29	5,9
		Average age of employees in the sphere of tourism, years old	42	45	93	
		The number of students in higher educational institutions getting education in the sphere of tourism, persons	550	985	56	
Consumer	0,1	Touristic services consumed per capita, rubles	53210	80430	66	6,6
Infrastructure	0,2	Density of railroad network of public service, kilometers of railroads per 10000 kilometers of territory	18	577	3	1,2
		Density of motorway network of public service, kilometers of motorways per 10000 kilometers of territory	202	2156	9	
Financial	0,1	Profitability of service organizations, %	8,4	45	19	1,9
Institutional	0,05	The level of development of institutional sphere, points	6	10	60	3
Innovation	0,1	Relative share of innovative approaches and solutions to services rendering, %	15	47	32	3,2

Source: results of own research

The obtained integral values of investment potential components indices (I) were adjusted to weight values of the factors of environmental and economic risk. Obtained as a result values of components of investment potential of coastal areas of the Azov Sea and the Low Don are presented in Table 5.

Table 5. Environmental and economic risk-adjusted values of investment attractiveness indices of the coastal areas of the Azov sea and the Low Don river of the South of Russia

Factors of investment potential	*Risk-adjusted factor value*			
	Urbanization risk	Infrastructure risk	Engineering and technical	Anthropogenic risk
Natural and resource	1,82	3,65	3,65	1,82
Production	0,30	0,15	0,15	0,30
Labour	0,59	1,18	1,18	1,18
Consumer	0,66	1,98	0,66	0,33
Infrastructure	0,12	0,06	0,12	0,12
Financial	0,19	0,09	0,09	0,09
Institutional	0,30	0,30	0,30	0,30
Innovation	0,96	0,16	0,64	0,96

Source: results of own research

The obtained results of the calculations enable to make judgments about the level of some kinds of environmental and economic risks for every component of investment potential of the area. For visual clarity the profile of the components of environmental and economic risks for every component of investment potential of the area is presented in Figure 1.

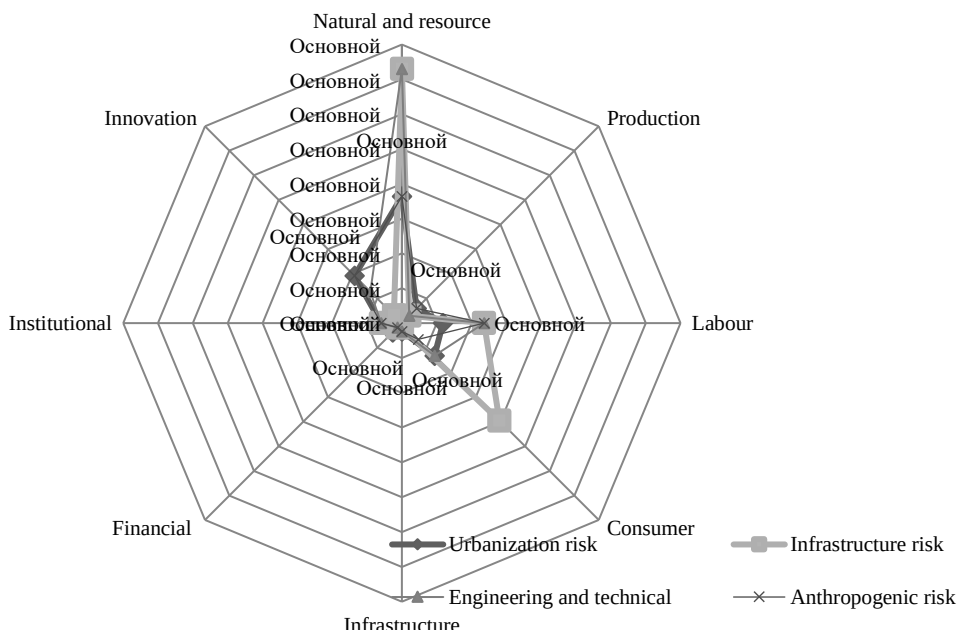

Figure 1. Profile of environmental and economic risks of realizing investment potential of the coastal areas of the Azov sea and the Low Don river of the South of Russia

Source: results of own research

From the data presented it becomes obvious that the highest risks of investment project realization of the coastal areas of the Azov Sea and the Low Don of the South of Russia can occur in respect to natural and resource potential which in its turn is subject to urbanization risk and anthropogenic risks. Engineering and technical risks are also very significant to natural and resource potential. There are also risks connected with realization of consumer potential of the area; in this respect the most significant risks are anthropogenic, engineering and technical and infrastructure risks.

Thus, the results of the carried out analysis enable us to draw the following conclusions. Creating touristic and recreation area in the territory of the Azov Sea and the Low Don of the South of Russia is connected with a number of environmental and economic risks caused by the following factors: underdevelopment of transport infrastructure and low transport capacity decreasing consumer attractiveness of the areas; high anthropogenic impact due to the neighbourhood of megalopolises as well as the possibility of take-over of the potential recreation areas by megalopolises; difficulties in providing urban amenities and engineering preparation of the territories – leading to negative consequences (drying up, swamping, flooding and etc.).

Table 6 reflects the possible impact of environmental and economic risk on investment potential components of coastal areas of the South of Russia in case of realization of projects in touristic and recreation sphere.

It is obvious that the level of environmental and economic risks in many respects is connected to organizational and managerial component of the realized investment project. Thus, inefficiency of managing water objects (both currently as well as in spontaneous natural and climatic conditions) can increase the probability of engineering and technical risks. Solving of these problems is possible by means of a complex of measures based on the principles of sustainable development. The absence of the unifying vision of developing coastal area will lead to anthropogenic and urbanization risks. Inefficient managing of information flows leading to failures in the systems of obtaining information about the changes of the coastal areas state caused by social and economic as well as natural and climatic factors, hydro-geological changeability, can increase environmental and economic risks manifestation (Chernova, 2018; Matveeva, Chernova, Kosolapova, Kosolapov, 2018). Environmental and economic risks can occur both as a result of managerial or entrepreneurial initiative realized along with investment processes and as a result of taking no actions when the manager observing negative for coastal ecosystem effects of project realization doesn't take any measures to prevent them.

It ought to be remarked that in this research the authors touched upon the issues of the necessity of taking into consideration economic and environmental risks in assessing coastal areas investment potential. The research enabled to determine environmental and economic risks in realization of the projects in touristic and recreation sphere as well as to highlight the most significant ones. At that the research was neither aimed at quantitative estimation of these risks nor at determining their probability and possible losses. It can be explained by the existence of objective restrictions of the access to the information about technical and economic characteristics of the realized projects necessary for making such estimation. The qualitative estimation of risks can be obtained by insiders having all necessary parameters for making such assessment using any popular and universal methods for qualitative analysis.

Table 6. Impact of environmental and economic risk on components of investment potential of the coastal areas of the South of Russia

Components of investment potential		Urbanization risk	Infrastructure risk	Engineering and technical risk	Anthropogenic risk
The mostly risk-avert	Natural and resource	Chaotic exploration of the coastal area leading to the loss of historical value of the territory, its unique natural landscapes	Disproportion in transport loading of some areas	Avalanches landslides, floods, abrasion processes	Soil and vegetation cover degradation, decreasing biological diversity, environmental pollution
	Consumer		Failures in passenger and cargo transporting		Decreasing level of recreation potential of the area and its recreation and economic attractiveness
The least risk-avert	Infrastructure	Practically has no impact	Disproportion in transport loading of some areas	Necessity for adjustment of engineering and technical parameters of the project	Practically has no impact
	Production	Practically has no impact	Failures in passenger and cargo transporting		Practically has no impact
	Labour	Practically has no impact		Practically has no impact	Practically has no impact
	Financial	Practically has no impact Additional costs related to the adjustment of engineering and technical parameters of the project			
	Institutional	Unauthorized constructions, uncontrolled illegal construction	Using natural resources not for the benefit of the population	Practically has no impact	Practically has no impact
	Innovation	Demand for modernization of some directions of investment project, using innovation technologies, products and etc.			

Source: results of own research

The presented toolware proves the possibility of being included in the methods of area investment potential for taking into consideration the consequences of disrupting the balance of coastal ecosystem at realizing investment project. The authors' toolware enables:

- to find out limiting factors in realizing the area's investment potential and to determine measures aimed at increasing investment attractiveness of project realization in the industry under examination;
- to compare indices of environmental and economic risk of investment project realization for different regions and to choose the one which is the most attractive to the investor;
- classify coastal areas by types of problems of investment projects realization in order to work out and use the instruments and mechanisms mitigating negative factors of development.

5. Conclusion

The authors of this paper proved the scientific idea that the coastal area should be considered as ecosystem represented by the combination of natural and resource, economic, social, landscape and other elements the combination of which

determines definite opportunities of investment development as well as related environmental and economic risks. The authors propose the estimation toolware enabling to identify environmental and economic risks occurring in the process of realization of the investment project in coastal area as well as to assess their significance for every component of investment potential of the region. The distinctive feature and the advantage of the toolware is that: firstly, it enables to take into consideration branch specifics of investment projects proposed for realization as well as specifics of regional factors and conditions; secondly, it enables to assess the impact of environmental and economic risks on separate components of the area's investment potential; thirdly, this toolware is universal and can be easily adapted to other industries and spheres of activity as well as to specifics of regional factors and conditions. This software was tested on the projects in tourist business and demonstrated its usefulness raising the effectiveness of regional management.

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