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Spatial and industrial analysis of functioning of coastal region territories

Análisis espacial e industrial del funcionamiento de los territorios de la región costera

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Abstract
This research analyzes coastal territories and highlights their socio-economic characteristics. The summary regarding the variety of terms «coastal region» was carried out enabling to formulate the author's position and an adaptive definition of the analyzed term. The main purpose of the work is to identify the impact level of endemic economic activities of coastal territories on the regional economy in general. The methodological approach consists of sociometric and statistical units resulted in a comprehensive assessment of the endemic industries role on the economy of the region. The conclusion is that the specific activities are mainly supportive and stabilizing for the economy of the analyzed region.
Key words: regional economy, coastal regions, specific activities

Resumen
Esta investigación analiza los territorios costeros y destaca sus características socioeconómicas. Se realizó el resumen sobre la variedad de términos «región costera» que permitió formular la posición del autor y una definición adaptativa del término analizado. El objetivo principal del trabajo es identificar el nivel de impacto de las actividades económicas endémicas de los territorios costeros sobre la economía regional en general. El enfoque metodológico consiste en unidades sociométricas y estadísticas que dio como resultado una evaluación integral del papel de las industrias endémicas en la economía de la región. La conclusión es que las actividades específicas son principalmente de apoyo y estabilización de la economía de la región analizada.
Palabras clave: economía regional, regiones costeras, actividades específicas

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1. Introduction

1.1. The variety of theoretical definition "coastal region"

The spatial palette of regions is of the greatest interest for studying not only within the context of a geo-combinatorial location but also the identification of special zones for generating resource capacity and capabilities for sustainable development of the regional system. The formation of such zones is influenced not only by raw materials and natural-climatic components but also the institutional structure as a certain model of the State authority at the regional level (Lloyd, Peel, & Duck, 2013).

Our study focuses on coastal regions. These areas exceed the level of landlocked regions lacking some economic advantages.

The advantages of coastal regions should be analyzed from the standpoint of capabilities from being the main incentive and locomotive for the growth of the regional economic and social sphere. The geographical location of the territory and adjunctions to the resource-based strip are its primary characteristics (Mikhaylov, Mikhaylova, & Kuznetsova, 2018).

To understand the definition "coastal regions" one should expand the substantive content of semantic volume of the object under analysis and refer to the studies conducted by several authors considering the border between the sea and land from different perspectives: "coastal territory"; "coastal zone"; "coastal strip".

Table 1
Definition of essential content of retrospective approaches
to determine border between sea and land.

Author	Description
1. F.J.Hoozemans, R.J.T. Klein, A. Kroon and H.J. Verhagen	Coastal zones (territories) (CZ) provide people with vital space, living and non-living resources, implement regulatory function regarding the natural and man-made environment. CZ is a multi-user system, as private and public organizations use natural resources for the operation, economic activity and recreation.
2. A.M. Nesterova	The author interprets the concept of "coastal territories" (CT) as zones with special natural and climatic characteristics enabling to strengthen direct economic links between the foothills and mountains making the framework of the formed agglomeration to ensure social and economic development of the region.
3. E.P. Afanasieva	The author interprets the concept of "coastal zone" (CZ) from the standpoint of tourist destinations. These are territories that have significant recreational resources and require a special approach to the management of their economic development without environmental damage.
4. E.B. Saryshakhin	Coastal regions (CR) represent the economic sub-system of the national economy that has many specific features and characteristics. The distinctive feature of CR economy is the presence of a sea border, thus having the features of the maritime economy and a close connection with maritime activities.
5. Dario Cesar SANCHEZ	A coastal zone (CZ) is the space that combines land and the sea with a fragile ecosystem extremely vulnerable to natural hazards (erosion, flooding, salinization of aquifers). This zone unites public and private areas, jurisdiction and responsibility at national, regional and local levels.
6. G.G. Gogoberidze	The author considers a coastal zone (CZ) as an area including a part of the land and a part of the sea in direct and significant interaction, as well as consisting of the adjacent waters, the coastline and the alongshore piece of the land. Accordingly, the concept of a coastal territory can be defined as a limited alongshore part of the land with its

Author	Description
	inherent natural and anthropogenic properties and resources characterized by the length (area) as a special "spatial" resource, geographical location and other economic, political and military characteristics being the object of specific activities or research.
7. E.G. Kropinova, E.P. Afanasieva	Coastal territories (CT) are complex objects that include geographical, ecological, economic and social systems. The attractiveness of these territories associated with the strengthening of economic development necessitates comprehensively studying the capacity of natural complexes within coastal territories to ensure their sustainable development.

Source: (Hoozemans, Klein, Kroon, & Verhagen, 2001) (Nesterova, 2013) (Afanasieva, 2014) (Saryshakhin, 2014) (Caesar, 2013) (Gogoberidze, 2008) (Kropinova & Afanasieva, 2014)

The definitions above describe to a large extent the geographical features of territories. However, we are interested in the economic interpretation sothe definition by Kropinova and Afanasieva is the most appropriate. According to the purposes of our research,«coastal region» is defined as a complex social and eco-economic system that has a more diversified economy through specific activities being the historical cornerstone of the livelihoods for native inhabitants in the region.

The coastal region is an economic phenomenon characterized by the diversity and grouping according to the following taxonomic features constituting the entire variety of characteristics and functional composition, regardless of the natural and climatic location of the region in the Russian Federation:

- geographical location: remote; hard-to-reach; peripheral; semi-peripheral; and central. This grouping considers the location of the coastal regions depending on the distance from the central regions of Russia and the transport accessibility. The remoteness is determined by distance indicators, whereas logistics and transport infrastructure provides connectivity with other regional centers. The market value of these directions is quite high also having established ties. Hard-to-reach coastal regions are areas with critically low levels of trade (compared to other coastal regions) and a backward transport hub system. These territories are exposed to the development of depressed economic processes, a passive demographic environment and a high-level migration (Doloreux, Shearmur, & Figueiredo, 2016)

- economic capacity: donor regions (self-sufficient); recipients (dependants); mixed type. The economic capacity of separate regions poses a specific issue due to the high degree of their differentiation. In this regard, it is necessary to consider a set of conditions for forming and functioning of the economy, the social portrait of the territory and its institutional environment. At the same time, the classification is open so that regions can drift from one group to another in certain time periods. The mixed type is common for territories with the most effective economy that utilize all possibilities of regional natural-climatic and raw-material capacity (Waite, Kushner, Jungwiwattanaporn, Gray, & Burke, 2015).

- resourcing: resource-excessive; resource-deficient; resource-sufficient. This grouping outlines the subject field common for coastal-type regions due to the availability of the sea line and coastline resources. The ability to exploit the resource base with environmental protection management is a priority for regional authorities and the business community (Klochko, Zhukov, Zaitseva, Sychanina, & Kovaleva, 207). Many coastal regions are resource-excessive supplying other regions of the Russian Federation with unique raw materials (Klochko, Zhukov, Zaitseva, Sychanina, & Kovaleva, 207).

- the global marketplace positioning: oriented towards global markets; focused on domestic markets; having multi-subjective orientation. Permanent economic space transformation forces regions to timely adapt and, if necessary, re-profile market-oriented directions. Multi-subjective orientation is usually inherent with coastal regions (Lazzari, Becerro, Sanabria-Fernandez, & Martín-López, 2019). Due to the distributional deconcentrating across the territory of the Russian Federation, there is an imbalance of the raw material base peculiar to the territories bordering the sea only, as equal distribution of resources to internal markets meets the needs of other regions. However, there are hard-to-reach coastal regions that in the absence of a developed transport/logistics chain are oriented towards external global markets with foreign trade operations prevailing in the structure of trade turnover (Waite, Kushner, Jungwiwattanaporn, Gray, & Burke, 2015).

- the dominant type of problems: problems of spatial location; problems of economic monospecialization; problems of border conditions; problems of small demographic numbers; problems of regional internal crises. The national economic space is anoutline for the functioning of the second-order economies (regional). Coastal regions are areas with the high capacity levels, but at the same time, they concentrate a significant number of problems due to their borderline location, remoteness from the centre, the demand for demographic resources, and the environmental sustainability of the coastline and the sea line. The locality of the problems is determined by the degree of its impact on the socio-economic indicators of the region and the ability of the regional authorities to solve them. The economic monospecialization of coastal regions can be caused by several problems: lack of the State support; high-level depreciation of fixed assets resulting in high prime cost and low demand for manufactured products; personnel shortage; and inadequate research facilities (Klochko, Zhukov, Zaitseva, Sychanina, & Kovaleva, 207).

Identifying the development level of the specific industries in coastal regions is the overall purpose of this research enabling to highlight the role of economic activities characteristic of these territories and to form adaptive instruments for their balanced socio-economic advancement. In this regard, the study of the socio-economic capacity of these territories should be based on specific methodological approaches that combine all the aspects regarding the functioning of the coastal zone.

We selected the Chukotka autonomous district (the Chukotka AD), which is a part of the Far Eastern Federal District, as a model region for the implementation of the analytical approach.

Regions of the Far North of Russia are referred to as problematic. The development of economic activity "hotspots" is the main task of the Russian Government aiming at enhancing investment and migration attractiveness. The most significant point impacting the condition of the medium and small business is a territorial remoteness and a transport infrastructure that complicate the production distribution to other regions and significantly increase the prime cost of goods and thereby reduce its competitiveness. The consolidation of production and economic efforts with capacities of entrepreneurial facilities will significantly reduce the production and transportation costs for finished products.

In the Chukotka AD, the traditional type of employment for the local population is agriculture, manufacturing and fishery. The development of this sector of the regional economy is significant and meaningful since the unemployment rate of the native inhabitants is 4.5 times lower than the number of shift workers recruited from other regions.

Analyzing the economic structure of the Chukotka AD, the following peculiarities were identified:

- the prevailing of the extractive industries in the GRP;

- low level of investment flows, an absence of investment strategy in the region;

-low-efficient utilization of marine and coastal resources;

- the low infrastructural effect of the extractive industries;

- low qualification of the local population;

- increasing numbers of unemployed local inhabitants due to the stagnation of endemic industries (fishery, manufacturing).

The monospecialization of the region leads to underutilization of existing capacities and reinforces negative externalities at the inter-sectoral level. The current situation of intraregional dependence on commercially efficient industries does not take into account the full extent of the functional requirements of the regional social system. In this regard, an approach should be developed enabling pinpointing and an effective assessment and identification of socially significant industries taking into account their economic capacity.

2. Methodology

The economy of the coastal territory is more diversified, the capital and resource flows are different and variable. The sphere of specific industries includes directions related to maritime activities: shipping; fishery; mining (seabed); research activities; and seawater balneology To designate these activities,we introduce the term "endemic industry" It is a kind of economic activity that is characteristic for a territory depending on its natural-climatic, resource-based and strategic disposition. At the same time, the main criteria for assigning industries to endemic ones should be clarified: - conditionality of the natural-climatic peculiarities of the region; - employment opportunities for the local population; - social value of the industry; - the unique character of the manufactured products. (Afanasieva, 2014) (Klochko, Zhukov, Zaitseva, Sychanina, & Kovaleva, 207)

An endemicity-based extraction of economic industries of the coastal regions will enable:

- to define the specialization of the regional economy depending on its location and natural-climatic capacity;

- to adapt the actions of federal, regional authorities to the opportunities of the regional economy in implementing the State support and targeted financing of promising activities;

- to identify the personnel shortage of specialists in endemic industries;

- to coordinate environmental actions of the coastal territories taking into account the peak load on the active entrepreneurship zones.

The methodological approach to identifying endemic industries is the author’s original. It is applied in assessing the capacity for selective stimulation of territories with harsh natural-climatic conditions for living and doing business aimed not only at increasing economic indicators but also at improving comfort and quality of life.

3. Results

Our approach is based on an indirect analysis of the social and economic blocks of industry indicators (specific for the region under study) of the attributive and quantitative character. The subsequent variational interpretation will enable to assess the prospects for their clustering. The clustering of economic industries is one of the most effective types of locating economic facilities that allows to mitigate stagnation processes and increase the investment attractiveness of the region.

The selection of indicators for the social block is implemented in an effort to assess the quality of life and availability of guaranteed social services for the employees of endemic industries. These criteria are difficult to quantify. At this stage, the main task was to formalize the "range" of statistical data.

Table 2

Estimating survey questionnaire for identification methodology for endemic industries of coastal regions (according to 2017 data)

Quantitative indicators	1*	2	3	4	Attributiveindicators	1	2	3	4
Social value level of industry									
1.Share of tax revenue by activity,%	45,4	4,8	0,1	1,1	1. Does the industry have the highest impact on the social development of the territory? (employment, infrastructure)(1– the highest,3–the lowest)	18	19	43	20
	1	2	4	3	2.Could the industry function without involving employees from other regions?(1 –yes,2 – partially,3 –no)	44	25	15	16
2. Employment rate by activity,%	18,9	1,0	4,4	0,8					
	1	3	2	4	3.Is the industry traditional for native inhabitants?	45	35	16	15
3. Average salary by activity, RUB	82937,4	69695,5	24556,6	53408,1	4. Does the industry lack the personnel within the region? (1 – to a lesser degree)	44	37	16	18
	1	2	4	3	5. Does the industry ensure the well-being of the economically active population in the region? (1 – fully,2 – partially,3 – does not)	34	28	44	33
4. Number of employees doing work under civil law contract (watch)	498	137	23	13	6. Does the employment in the industry involve handicraft and ancillary production?(1 – yes,2 – partially,3 – no)	44	40	17	16
	4	3	2	1	7. Is the industry promising in providing an employment for the local population? (1 – rather yes, 3 – rather no)	40	28	20	16
5. Number of employees hired, people	2028	40	657	109	8.To what extent is the industry attractive for the population from other regions? (1 – the highest value)	17	42	32	30
	1	4	2	3	9. Do the industrial enterprises implement programs of socially responsible behavior? (1 – rather yes)	20	44	39	34
6. Number of employees left, people	1809	58	725	179	10.Is there any training or professional advancement for employees based on the industrial enterprises?(1 – high probability)	27	43	39	38
	1	3	2	4	11.Is there any prospects for the development of the industry and, consequently, employment creation? (1 – the greatest)	20	42	25	28
7. Proportion of employees operating in harmful working conditions,%	57,8	2,2	-	-	12.Are there perspectives and reserves for increasing salary funds?	18	41	38	37
	3	2	1	1	13.To what extent are working conditions in the industry hazardous to the health and the life of employees within the region?(1 – least hazardous)	40	38	29	37
8.Number of employees injured at work, people	6	-	-	-	14. To what extent are the industrial enterprises compliant with labour law regulations? (1 –to a greatextent)	28	38	32	29
	2	1	1	1	15.Do the industrial enterprises initiate social events?	25	42	39	37
9. Number of unemployed having working experience by activity, people	68	110	22	15	16. Are the industrial enterprises compliant with the work-rest schedule in harsh natural-climatic conditions of the region?	36	39	30	35
	3	4	2	1	17.Is there a timeliness of salary payments and social contributions? (1 – always timely)	29	43	31	39
Results:	17	24	20	21	**Results:**	529	624	505	478

Impact of industry on regional economy									
1. Number of enterprises by activity	46	32	55	18	1. Does the industry provide economic impact in the territorial development?(taxes, economic performance of the region) (1 – yes,3 – no)	16	40	32	35
	2	3	1	4					
2. Value of non-current assets by activity, %	55,9	25,8	0,8	0,1	2.To what extent does the development of the industry depend on the state of the infrastructure?(1 – heavily,2 – to a greater extent, 3 –to a lesser extent)	31	35	29	28
	1	2	3	4					
					3.Does the industry have a sufficient resource base?	16	33	40	34
3. Share of the industry in GRP,%	35,2	0,2	1,5	1,4	4.Is the industry equipped with production assets in the region?	18	40	39	35
	1	4	2	3	5.What is the level of domestic consumption of final product within the region? (1 – high,2 – average,3 – low)	42	31	15	15
4.Volume of fixed capital investments, mln. RUB	5998,9	6,7	129,5	2,3	6.Are there possibilities for increasing an export share of the commodity production? (1 – the highest)	20	39	40	30
	1	3	2	4	7.Does the industry receive a sufficient federal and regional State support and incentives? (1 – the highest)	18	42	32	31
5.Number of small enterprises, units	18	2	-	-	8.Are there any alternatives to the industry in the region or adjacent territories? (1 – none, 2 – partial alternatives,3 – some)	22	35	37	29
	1	2	3	3					
6. Balanced financial result, mln. RUB	10642.2	-42,9	103,4	64,0	9. How developed is the intra- and inter-regional logistics of the industry? (1 – developed)	21	32	44	40
	1	4	2	3	10.What is the state of industrial R&D facilities throughout the region? (1 – sufficient)	15	30	45	36
7.Share of loss-making organizations,%	37,5	100,0	38,9	50,0	11.Are there perspectives for cluster formation for industrial enterprises throughout the region?	20	42	44	30
	1	4	2	3	12. Are there perspectives for the development of different integration ties with enterprises from other regions?	19	42	40	29
					13.How attractive is the industry for foreign investment?	17	43	39	30
8.Current ratio	181,6	113,5	128,8	144,9	14.How intense is the competition among industrial enterprises?	20	45	35	39
	1	4	3	2	15.Does the industry apply innovative approaches in its activity?	25	45	45	40
9.Working capital to current assets ratio	17,0	-560,0	29,2	66,7	16.What is the image of the industry as a systemically important type of economic activity for the regional economy? (1 – favorable)	28	45	39	40
	3	4	2	1	17. Do the industrial enterprises create zones of sustainable economic growth throughout the region? (1 – to a great extent)	20	45	37	35
Results:	12	30	20	27	Results:	368	664	632	556

*1- Mining; 2- Manufacturing; 3- Agriculture; 4- Fishing, fishery.

Table 3
Results of applying methodological approach to identifying endemic industries of coastal region

Typological group	Interval value for quantitative indicators	Interval value for attributive indicators	Quantitative indicators		Attributive indicators	
			Group code	Industry	Group code	Industry
Super-endemic	9-14	255-357	E-1	1	E-1	1
Socially developing			C-1		C-1	
Leading-endemic	15-20	358-459	E-2	2	E-2	2
Socially stabilizing			C-2		C-2	
Latent-endemic	21-25	460-561	E-3	3	E-3	3
Socially supporting			C-3		C-3	
Backward-endemic	26-31	562-663	E-4		E-4	
Socially inactive			C-4		C-4	
Non-endemic	32-36	664-765	E-5	4	E-5	4
Socially regressive			C-5		C-5	

4. Conclusions

The combinatorics of results is most valuable for implementing the targeted and point support as well as facilitating prospective industries (according to the experts) of the Chukotka AD. The typological grouping characterizes the industries as follows:

1. The mining industry in the Chukotka AD is socially stabilizing according to the quantitative analysis, high salary level, high vacancy numbers, and a significant amount of tax payments to confirm this. The experts indicate that the industry is, however, socially supporting due to the low employment possibilities for native inhabitants being in dire need of working opportunities. But due to the expanding production, the infrastructure programs are being implemented through the State support of the industry. According to the experts, the industry is leading-endemic in economic terms. It is also super-endemic following the statistical data as it is a mainstay of the regional economy and has the highest economic and social indicators. The industry has high prospects for cluster formation locating in the territory of the Chukotka AD without attracting additional capacities from the enterprises of the Far Eastern Federal District.

2. Manufacturing. With high-level extractive industries, the presence and operation of processing enterprises in the region is a necessary and logical condition for the competitiveness of both sectors. According to the analysis, the Chukotka AO is a raw material producing region with a missing processing base. So according to quantitative analysis, the industry is backward-endemic, while the expert group characterizes it as non-endemic within the territory due to the lack of productive capacities and investment prospects. In social terms, the industry is stabilizing-endemic with high salary level, the share of tax payments and the number of employees to confirm this. The questionnaire describes the industry as socially inactive due to reducing production as well as the lack of economic prospects for any activities allowing to make only short-term forecasts of gradual degradation of the industry.

3. Agriculture is of a high social value for the Chukotka AD. According to statistical analysis, the industry is socially stabilizing, whereas following the expert assessment, it is socially supporting, enabling to provide employment for the native inhabitants of the Chukotka AD. The industry, in particular, requires workers without high qualification, with no special education needed. According to Chukotstat, the agricultural industry is leading-endemic based on economic terms with the high current ratio, significant investment volumes and positive financial results of activities in 2017. The expert evaluation characterizes the agricultural industry as backward-endemic due to the insufficient utilization

of the existing capacities. The uniqueness of the manufactured products, as well as the specific character of community-based production (local mentality), complicates the formation of the agricultural cluster. However, the absence of such production within the Far Eastern Federal District increases the competitiveness of products, raises the market value.

4. Fishing/fishery is a traditional activity for the population in the coastal strip of the Chukotka AD. In social terms, our analysis refers it to the socially supporting group as itcarries out not only food security function, but also provides employment. According to economic terms and statistical analysis, it is backward-endemic due to low investment attractiveness of the territory in general and the industry in particular along with significant wear and obsolescence of capacities. Following the expert analysis, the industry is latent-endemic. It has the significant socio-economic capacity and prospects regarding the formation of a fish industrial cluster on the basis of the Far Eastern Federal District as a separate transport/logistics locus.

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