

## THE NATURAL RESOURCES FACTOR INFLUENCE ON THE INDUSTRY FORMING PROCESS IN ASTRAKHAN REGION

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The main industrial-resource components potentials of Russian Federation Astrakhan region situated on the southwest part of Eastern-European plain within Peri-Caspian lowland the northwest part are shown in this article. Also their modern state, development perspectives, influence on economic and ecological region safety are analyzed, on the basis of which industrial-resource division into districts was carried out as a result of which 5 industrial-resource districts were distinguished: South, Pre-flood, Southwest, Northeast (forming), North.

**Keywords:** natural-resource potential, industrial-resource division into districts, economic and ecological region safety.

### INTRODUCTION

The research area is in the southeast of East European plain within the northwest part of the Peri-Caspian lowland, the Volga and Akhtuba flood - land and the Volga delta expanse of which in Astrakhan region is over 400 km and the Volga occupies a nodal position in the Peri-Caspian cavity suture zone of pre cambrian East European platform and Karpinsky range of the epi-Hercynian Peri-Caucasian platform.

Numerous fundamental researches and scientific publications of regional, geological and natural resources character convincingly prove that Astrakhan region has a diverse and significant natural raw materials, which can make a strong basis for successful development of industrial production branches majority [1]. In spite of an insufficient knowledge of the region geological structures on the availability of various mineral deposits, it can be referred to one of the richest and economically perspective regions of Russia, Peri-Caspian region countries, Europe and Asia that adds the status of the international significance to this problem. It is necessary to refer to the hydrocarbonic and mining-chemical raw material, water and biological resources to the most significant Astrakhan region resources.

### THE PRESENTATION OF THE MAIN MATERIAL

#### **Hydro carbonic raw material**

Hydro carbonic raw material development is the basic branch of Astrakhan region modern industry that has predetermined a quick growth of fuel industry and gas chemistry in the last decade. Five deposits in Mesozoic and two gascondensats deposits (GCD) are detected in Paleozoic sediments according to N.I. Voronin data in the region territory [2]. Four deposits among them are in development:

Astrakhan (the following ingredients enter into the compound of gas: methane gas is 54%, hydrogen sulfide is 22-24%, carbonic gas is 19-22%; one cubic metre of gas

contains on the average 250 gr of condensate), Beshkul (the Beshkul oil deposit is developed by the Open Company « LUKOIL - Astmorneft ». Extraction has made 261 thousands of tons in 2001, extracted oil resources was 230,0 thousands ton in 2017). Promyslovskoe (the Promyslovskoe gas deposit is developed by the Open Company «LUKOIL-ASTMORNEFT»). Extraction was 22,3 million cubic meters. The gas safety reserves at extraction about 20 million cubic meters is 15 years in one year. The industrial reserves of gas is 309 million cubic meters. North-Shadzhinskoe (Development of the North-Shadzhinskoe GCD was made by the Open Company "LUKOIL-ASTMORNEFT" in 1999. The gas extraction was 10,2 million cubic meters. The industrial reserves of gas ( $C_1$ ) was 1736 million cubic meters and categories ( $C_2$ ) was 2065 million cubic meters. The industrial reserves safety will be more than 80 years at systematic extraction of gas about 20 million cubic meters in a year. The Bugrinskoe gas deposit keeping a hydrogen sulfide, is not equipped for gathering and hydrosulphuric gas transport, therefore it is in preservation (condensate reserves of category  $C_1$  average 0,3 million tons;  $C_2$  is 0,2 million tons. The gas reserves average 1263 million cubic meters [3].

The Verbluezhie oil deposit is in investigation (Oil of the Verbluezhie deposit according the parameters (density, viscosity, paraffinicity) demand the use of special development methods). There is also the Alekseevskoe (the Alekseevskoe GCD (Elenovskaya square) in the investigation stage, the gas condensate long fallow was detected in 1998 in the coal sedimentation on the depth of 3900-4100 m. The gas reserves of category  $C_1$  were 7,5 billion cubic meters,  $C_2$  was 5,5 billion cubic meters, the GCD is in 75 km to the north - east of Astrakhan. Gas inflows were obtained from coal deposits on Tabakovskaya area (The reserves were about 9,0 billion cubic meters).

The Astrakhan region is the owner of the sour gas-condensate field largest in Europe (SGCD), exploitation of which has appreciably stipulated a quick growth of the Volga region area fuel and energy complex. Astrakhan SGCD resource base (Astrakhan SGCD raw-material base has allowed to receive only more than 11 million cubic meters of natural gas in 1999, and also about 3 million tons of sulfur, and at the subsequent processing to put to the Russian firms about 457,8 thousand tons of gasoline, 510 thousand tons of diesel fuel. In the long term, in connection with significant production of Western Siberian gas deposits and their cost price rise, Astrakhan region can become a sole exporter of natural gas to Western Europe on a category ( $A+B+C_1$  and  $C_1$ ) that is 2565 billion cubic meters in the left-bank part and 88,980 billion cubic meters in the right-bank. Global experience shows, that development of power resources new sources is capable to become an economic cradle for the macroeconomic development, and it fully responds the strategic interests of Russia economic security and is capable as a result of their, many years service to satisfy requirement of inner customers in power resources [3].

### **Sulfur**

It is an important strategic chemical raw material having wide spread use in main chemistry branches and effecting fertilizers artificial production (The sulfuric polyfoam which apply at laying pipe lines and highways was made in Canada; the sulfur concrete and sulfuric polyfoam is used in construction). Together with positive industrial functions there are obvious negative exploitation consequences of this raw material sort. The

ecological strength on adjacent territories increases at extraction and further processing [2].

#### **Fine salt**

The special geological conditions connected with salt tectonics occurrence, have allowed to speak about the unique complex of deposits in the territory, adjoining lake Baskunchak. One of the world largest deposits of fine salt high-quality is connected with this lake (chloric sodium content is 98%). Salt is deposited up to the depth of 600 m on the geological data, alternating with clays and sands shifts. Surface groundwater nourishing the lake, which waterproof layer, is the rock salt, postponed 240 million years back at the bottom of shallow under-perm basin, 800-900 thousand tons are annually brought. The salt brine of high mineralization is a strong brine salinity of which is 300‰ in conditions of the arid climate, at high evaporation power and minimum rainfall (250-270 mm) on lake surface. From all fine salt used in Russia, 80% is in Baskunchak. Mine salt of three kinds are extracted: novosadka, granatka (the quaggy crystalline mass) and chugounka (the dense stone mass which is necessary to grinde).

Besides the Baskunchak salt on the territory of bordering on the steppe ilmens to the west from Astrakhan, along Astrakhan – Elista line fine salt industrial extraction is carried out. These deposits are not significant according to the volume and recede on salt quality, they are used for the technical purposes (as a means of snow and glaze clearing) [4].

#### **Bromine-containing salt**

Industrial reserves of bromine are found in Baskunchak strong brine (extraction productivity is 2,0-2,5 thousand tons per year). It is the most valuable raw material for the chemical industry. On the available data, the unique firm of Russian joint-stock company "Halogen" (the Perm region) mines 500 tons/year that fails to meet Russian economy requirements. This deposit is considered the cost effective with average concentration on bromine 350 grams/cubic meters worldwide criteria. Technical bromine, carried out of this raw material, can be applied in production of the vitamins, medicine, dyes, freons, reagents, antipyridines. Elementary bromine is used for water disinfection (instead of chlorine), as a bleach or a chemical reagent. There are deposits of potash salts with a reserve of 420 million tons under forecasts in the area of bordering on the steppe ilmens.

#### **Mineral raw material for construction materials operations**

Brick clay and sand (including glass sand) are widely used and besides hydrocarbonic raw material, fine salt and sulfur in Astrakhan region are practically mined everywhere. It has stipulated progressive development of construction materials industry. About 90 deposits of fusible argillaceous rocks were revealed, suitable for brick-tile manufacture in the region territory however only 19 of them are actively used (Bakhtemirskoe, Kamyzyakskoe, Zelenginskoe, Sredneie, Yaksatovskoe, Krasnoyarskoe and others). There are five deposits of inundable clay which are valuable local construction materials for expanded clay manufacture (the Trusovskaya deposit, Tuguchinskoe and others). Industrial sands which are widely spread in the region territory are industrially reclaimed only in Streletskoe. Glass sands (the Tatar Bashmakovka) which are processed here in a

Glass Factory have industrial value or served as raw material on fiber glass factory (Astrakhan) [2].

### **Gaizes**

Gaizes main deposits are in the north part of the region - Kamennyarskiy (the Chernoyarsk administrative region) and Baskunchak (the Akhtubinsk administrative region). Total reserves of 28 deposits are taken into account by balance exploration by category A+B+C<sub>1</sub> are 47066 thousand cubic meters. Safety reserves are approximately 50 years. The Kamennyarsk gaize deposit, both on a resource potential, and on raw material quality can be referred to unique ones. These gaizes are characterized by a high clearness and homogeneity of consistence, the wide selection of commercial products can be obtained from them, capable to satisfy chemical industry requirements of South federal district in absorption materials, liquid glass, silicagel, etc. The products corresponding to artificial sorbents on properties from gaizes of the Kamennyarsk deposit can be obtained with a help of simple activation and modification technologies. In this respect they can be considered as the raw material which are alternate to natural zeolites industrial deposits of which are absent within European part of Russia. Absorption production use will allow to solve problems of environment preservation— drinking and commercial waters purification from harmful contamination, a drying and cleaning of sour gases, liquids and others [3].

### **Gypsum**

The Baskunchak deposit of gypsum refers to the category of large and is developed by joint-stock company " Mineral " and German Knauf company. Milled raw gypsum and gypsum stone which is produced on the enterprise has wide use in Astrakhan region.

Land resources are the natural basis for industrial-agricultural cycle stipulating the main industrial complex specialization of Astrakhan region. The agroclimatic resources quality is low, because of unfavorable natural factors in agriculture. It is possible to grow only drought-resistant cultures and cultures in the water impounding, however engineering arranged systems are not enough, and the fields water impounding constructed by the own account activities lead to soils salinization.

Brown soils along with light-brown alkali soils and salinas are mostly distributed. These soils can be used for cultivation of grain, vegetables and cucur bits under condition of water impounding. The most valuable are floodplain soils (meadow, ilmen-meadow, meadow-bog soils) which occupy large territories of the Volga-Akhtuba bottomland and the Volga delta. All region land reserves are 2910 thousand hectares. As a result of the extreme natural environment the region land reserves are involved in economic turnover only on 3/4. Residential area and industrial lands occupy 13 % of land reserves, and lands of agricultural use occupy 63 %.

Agriculturally used areas structure is specific: tilled areas are 12,1%, haylands are 13% and pastures are 74,8%. Two ways of pastures use are possible: animal agriculture development or lands cultivation and tilled areas expanding. The tillable lands percent in the agricultural land-use structure is insignificant, their usage degree is extremely low and it is impossible to raise it in the nearest future, as water impounding agriculture demands large investments, material and technical expenses.

### **Water resources**

Hydro resources essentially influence on Astrakhan industry distribution. Their main function is water and fresh water industrial production supply, an agriculture and the population. Water resources distribution on the region territory is inhomogeneous. The main part of potentially used water resources is at the south of region where Volga with its wide delta runs into the Caspian sea. However differences in water distribution are observed here too. Less quantity of water inflows the east part of the delta, in the system of the rivers Buzan and Akhtuba. Such inhomogeneous water resources distribution leads to the economic backlog of the delta east regions.

Simultaneously with it significant seasonal fluctuation of the surface runoff are noticed, and it makes specific allowances in other natural resources. Transport links and agricultural activity are difficult because of the river overflow. The bifurcation gate has been constructed (Narimanov town) with the purpose of equal aqueous runoff distribution within the river-delta part as main agricultural and industrial regions. However even these measures cannot provide progressive development of the east sector led to the unequal territorial structure formation of the industry.

The distinction of water resources distribution was clearly appeared in population distribution and industrial production. Territorial analysis has shown that the most typical connection of such objects is characterized by water resources contiguity, which parallelly carried transport functions. In this connection, typical expanse of territorial structure in Astrakhan region can be characterized as "at bed". Rising requirements of the modern industry in water resources marked increase of water-retaining plants (gas chemistry) will promote enterprise distribution of these branches in western sector of Volga delta where water resources supply will be maximum. The further shared use of transport and water resources industrial functions due to developed geopolitics and economic – geographical conditions, will lead to the inhomogeneous territorial development within Volga delta [5, 6].

Astrakhan region *Forest resources* are poor. The area coated with forest is 720 square kilometers, it is only 2% of the region territory, and 40% of forests set out artificially. The forest coated forbidden zones for economic use along the rivers is 67% of forested area, green zones are 25%. The field-safeguarding and soil-protective forests area exceeds 5 thousand hectares. Forest expanse of erosion-preventing designation play special ecological role. Forest resources use within the region is economically inexpedient in the industrial purposes. One of the profitable spheres of forest resources use is usage of them as recreation zones [7-9].

### **Recreational and balneological resources**

Recreation resources are a perspective source of budget replenishment. There are unique reserved places, historic and archeological monuments and educational tourism zones in the region. Essential possibilities of medical tourism are stipulated by the remedial muds and mineral waters existence. The big list of mineral waters, various on a chemical constitution and properties, including medical - drinking property has been found in the lake Baskunchak during exploration works. Medical muds deposits are

associated with the southern Astrakhan lakes (Tinaki) and in the north regions (Baskunchak).

Astrakhan region is rather perspective for revealing new large deposits of hydrocarbon raw material, fine and potash salts and construction materials, and for recreation resources use according to complex geological and ecologic-geographical evaluation. However, the exploration and natural resources development of the region is much lower due to its geographical remoteness from the central regions of Russia and uncomfortable climatic and natural conditions, than along the Volga economic region.

The following criteria have been put in industrial and resource classification basis: inner natural and economical and geographical differences between the separate areas; geological and geomorphological conditions; a composition, dimensions, quality and raw material properties and fuel within deposit; a structure and soils quality for economic use; territory development and people's living conditions; the transport system density; agglomeration perimeter of competent economic exploitation. These objects analyses allowed to carry out the industrial - resource classification of Astrakhan region as a result of which 5 industrial-resource regions were separated: South, Pripoimennyi (PreFloodlands), Southwest, Northwest, Boreal, North (see tab. 1).

The reclamation material resources of *South industrial - resource region* (SIRR) has the most remarkable influence of industrial production location. The SIRR is in the south of region within Volodarsky, Kamyzyaksky, Privolzhsky and the northeast part Ikryaninsky administrative regions (see fig. 1) and it is characterized by the fish use, as well as sea bioresources, on the adjacent waters of the Caspian sea, water and mineral resources (mostly brick clays), that is the natural base for fishing industry, industrial-land and industrial-building cycles of production development. Besides the SIRR has recreation resources where the unique deltoid visual environments and Astrakhan biospheric state reserve territories. In the SIRR complex the formed North Caspian resource block can be distinguished, which is adjoined to oil deposits, explored the Caspian sea shelf [10].

Table 1.

The industrial - resource regions (IRR) \* specialization

The name of the IRR	Resources	Industrial functions
South	1. Fish (including sea biological) and pedologic 2. Brick earths, glass sand, water and recreational	1. Industry regions and fishing and the food-processing industry centers formation (Kamyzyak, Volodarsky, Kirovsky, Nachalovo, Marfino, Tumak) 2. Astrakhan industrial agglomeration industrial-construction base (Yaksatovo, Kirpichny zavod, Steklozavod), tourism

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Located near floodlands	1. Gas condensate with a high sulfur contents 2. Construction materials, water, balneological and soil (water -meadow)	1. Gas, energy and chemical cycle of regional specialization production formation (Aksaraisk) 2. Specialized industrial-construction, land and industrial subdistricts and the centers formation (Enotaevka, Kharabali, Sasykoli, Selitrennoe, Narimanov), the balneological resort (Tinaki)
Southwest	1. Fish and soil resources  2. Hydrocarbonic, brick clays, water resources	1. Field regions and fish and food-processing industry centres formation (Ikryanoe, Oranjerei, Krasnye Barricady, Olya, Liman, Bakhtemir, Yamnoe, Lesnoe, Trudfront) 2. Gas, energy and chemical cycle formation (Jandyki, Liman), industrial and construction base of the international port (Promyslovka, Olya)
Northwest	1. Construction materials, soil, water resources 2. Hydrocarbonic (reclaim) resources	1. Center-forming functions of land-industrial and industrial-construction specialization centering (Nikolskoe) 2. Gas, energy and chemical cycle production perspective creation.
North	1. Fine salt, soil and construction materials 2. Mineral waters, recreation and balneological resources	1. Land-industrial regional specialization branch and Industrial-construction cycles fromation (Akhtubinsk, Kamennyi Yar, Srednii and Nizhnii Baskunchak) 2. Recreational and balneological complex (Baskunchak) formation
* 1. – The main resources providing the specialized industrial functions; 2. – the minor resources supplementing the industrial complex		

Fishing industry resources, together with the land resources, must be considered as the central and region forming. Now as a result of the complex natural resources use which are available here, the given region can be designated as combined one.

Features of commercial operation have predetermined region differences: there are the southwest part (Nikitinsky bank), Kirovsky and the southeast part (the river Bushma), Tumak village. Construction material resources presume their use in the industrial purposes both inside region, and behind its borders (Yaksatovo, Kirpichny plant, Steklozavod).

SIRR north part deposits are the most profitable for exploitation where they compactly adjoin to the Astrakhan industrial agglomeration.

The *Southwest industrial - resource region* (SWIRR) is in the southwest part of the region, within Limansky and Ikryaninsky administrative regions. The SWIRR resource

base is represented by various industrial resources (see fig. 1). Developed resources compound section precisely shows the center and region forming character of their influence on the industry territorial structure formation.

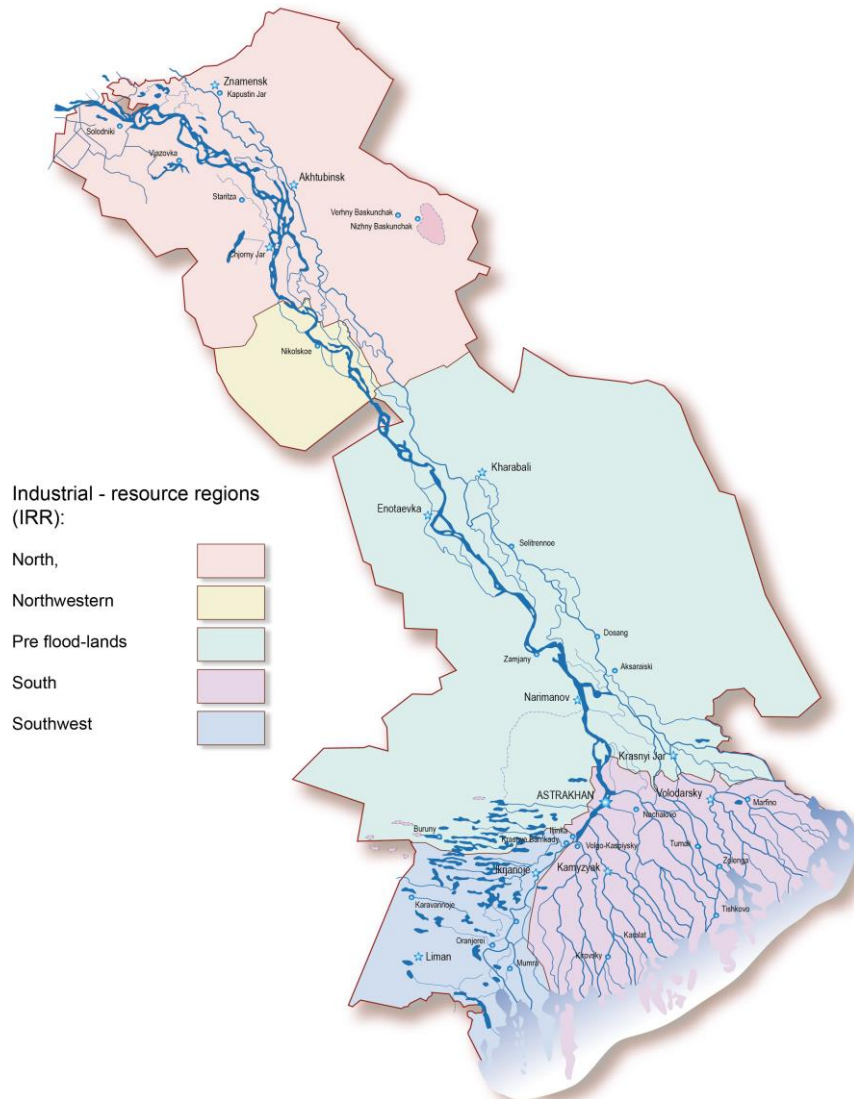


Fig. 1. Industrial and resource areas of the Astrakhan region

Fishing resources are naturally historically SWIRR developed resource base. The territory industrial structure was formed together with soil resources. The organized and regulated relations with industrial centers, existence of large and significant traffic arteries on the line of the Volga and Bakhtemir – the Volga-Caspian canal, allow to speak about a formed industrial axis Astrakhan – Olya. Industrial objects main specialization along this



axis is fishing and the food-processing industry with tender machine industry (Bakhtemir, Yamnoe, Lesnoe, Trudfront). The center forming processes were appeared here in sectioning of large specialized industrial objects (Ikryanoe, Oranjerei, Krasnye Barricades, Olya, Liman).

The SWIRR industry character development has predetermined two industrial - resource subdistricts separation – Promyslovskoe, which is combined with a specialization on construction materials and gas extraction, and Beshkulskoe, which is specialized on the oil recovery.

The Olya international port increasing importance, the industrial axis formation, production polarization in the delta western sector specifies the necessity of cheap local fuel resources use. The importance of already developed industrial sites against this economic background – Yandyki and Liman - will increase. Growing industry needs in production capacities and new manufacturing areas construction make possible industrial - construction resources resource base development represented by brick clays (Promyslovskoe).

*Near floodlands (PreFlood-lands) industrial - resource region (PFLIRR)* is located in Astrakhan region central part, to the north of the regional center within Enotaevsk, Kharabalinsk, Krasnoyarsk and Narimanovsk administrative borders. Industrial - resource subdistricts – Pravoberezhnyi, Kharabalinsky, Enotaevsky and North Astrakhan are distinguished in the territory of the PFLIRR. The resource factor influence is clearly in evidence as center forming by the example of the last sub-district. The unique largest exploited SGCD existence and alternate commercial deposits absence, inevitably leads to the territorial disproportion in the region development and to the production concentration in one industrial site (Aksaraisk).

Production concentration on the principle of integrated plant can bring wide economic benefits, however, along with it, the ecological stress on this and the adjacent territories will increase. The PFLIRR is located within Kharabalinsk, Narimanovsky, Krasnoyarsk and Enotaevsk administrative regions. Kharabalinsky subdistrict is the most prospective which is connected with the other region objects by Astrakhan – Moscow railway.

In the tectonic plan the subdistrict is within the northeast slope of the Astrakhan canopy and its border, adjoining on the southeast with the SGCD left-bank part, and in northeast with Verbluezhie deposit. The subdistrict is characterized by a wide salt tectonics reveal which has stipulated various kinds of oil and gas absorbers formation under saline complex (on depth 1500-3500 m). Perspectives are considered under Astrakhan canopy salt sediments (on depth 4200-5500 m).

It is possible to detect oil deposits on the given field – 250-300 million tons as the Kharabalinsky field is close to the region with the fixed industrial gas existence of subsalt and oversaline sediments. Probably the Kharabalinsky subdistrict will be considered as a highly specialized.

The PFLIRR Enotaevsky subdistrict occupies the territory from the bottomland of the Volga up to the borders with Kalmykia and is connected to the industrial centre with the Astrakhan - Volgograd federal road (see the application, fig.). In the tectonic plan the given subdistrict is located within the northwest part of the Astrakhan canopy and covers

partly Sarpinsky deflection territory, and in the southwest adjoins the SGCF right-bank part. It is possible to discover the oil deposits – 100-150 million tons as oil and gas existence in Astrakhan canopy subsalt sediments (on the depth from 4200 up to 5800 m) and in oversaline sediments (on the depth of 1500-3000 m) is predicted, taking into account the proximity to the Enotaevsky field to the right-bank part of the SGCF, and also to the Shadzhinsko-Bugrinsky zone gas deposits. The Enotaevsky subdistrict will be considered as a highly specialized raw. However the character of soil resources use in the combination with water resources rational use allows to make the supposition, that Enotaevsky and Kharabalinsky subdistricts can be used as raw-material bases for the industrial-land cycle [3].

It is necessary to pay attention to the other sorts of resources excavating in this region for the regular industry branch development– expanded clays and brick earths (Kosikinskoe), brick clays (Kharabali). The given resources recruitment phenomenon in the industrial revolution will allow to create potential industrial queues gas chemical combination on own region base. Sasykoli and Enotaevka industrial - construction resources were discharged as a result of exploitation. The human settlements relative separation is the main problem of the region which is called by a large water barrier – the Volga. As the result there was the inconvenient use of the right bank land full resources as the main industrial sites specializing on the agricultural production processing– Kharabali, the Selitrennoe are on the left coast.

It is necessary to discharge especially the North Astrakhan subdistrict. The North Astrakhan subdistrict specialization is expressed by the mass natural gas, condensate and sulfur extraction. The given subdistrict has no significant fish reserves and has no land resources, and water resources, together with power and chemical raw materials, allow to form here the branches of a gas, energy and chemical industrial cycle – this particularity defines its narrow specialization. One of the possible solutions is some industrial functions distribution on the dextral shore (Narimanov) in this situation [3-7].

The *Northwest industrial - resource region* (NWIRR) is in the northwest of the Astrakhan region, in the borders of Enotaevsky administrative region. Now the resource factor influence is described by the brick clays large deposits existence (Nikolskoe). It defines the specialized territorial frame development. The region-forming in the NWIRR is not represented, the center-forming functions are settled to its center – the Nikolskoe. The NWIRR is perspective now because of the significant explored reserves existence of hydrocarbonic raw materials (Bugrinskoe). This region use as the supplier of hydrocarbons will stipulate the combined character of its exploitation. The water and land resources existence allows to use it as a raw-material base for the industrial-land cycle.

The *North industrial - resource region* (NIRR) is in the north Astrakhan region, within Akhtubinsk and Chernoyarsk administrative regions. In the NIRR territory the Vladimirsky industrial - resource subdistrict can be distinguished, specialized on the construction materials extraction, and the Baskunchak industrial - resource complex – on the raw material extraction for food and chemical industry, the construction industry.

Center and the region forming processes are so called due to resource factor influence and were most brightly shown in this region.

It was precisely shown in the region center formation – especially in Akhtubinsk where on the developing territorial - branch units the transport-geographical and historical factors have influenced. As the result the block of food (land resources, mineral waters), industrial - construction branches were formed: brick clays (Akhtubinsk), limestone (Kubatausskoe). Region forming processes allow to discharge Cherny Yar the region center in a western part of the NIRR.

The resource factor influenced strongly the process of specialized territorial frames as an example of Baskunchak mineral complex organization. It is possible to discharge some resources groups here, suitable for all Astrakhan region industrial development. The industrial - construction (gypsum, flasks, marl, limestone, sandstone), mining-chemistry (fine salt and bromine-containing salt, mineral colors), food (mineral waters, fine salt), recreational (Bogdo and Baskunchak reservation) resources can be explored. The Baskunchak complex has become mining-chemistry, industrial-construction, industrial-land cycles raw-material base of production. Thus, some natural resources groups, in the Baskunchak mineral complex territory are fine combined and, practically, all of them have crucial importance in Astrakhan region specialization branches development [7, 11].

### **FINDINGS**

The natural resources development is at a stage of survey and investigation and restrained by the main industrial centers great distance (Astrakhan, Volgograd), developed transport net and infrastructure absence for whole North, Northwest and PreFlood-lands industrial - resource regions. The resource factor influence degree on the industry arrangement in these IRRS will depend on the highway and railways construction, building of new ones and the old manufacturing centers extend and labor rational use., It is necessary to underline the transport factor significance providing a connecting role between extraction stages and industrial raw material processing emphasizing the resource regions in the special territorial frames.

Astrakhan - Volgograd, Astrakhan - Moscow, Astrakhan - Makhachkala and Volga - Caspian sea transport axes do not only join with the resource regions to the industrial centre and the industrial processing center in Astrakhan, but also with such resource locales as the North Caucasus and the Middle Volga region, that affects region economic development (see the application, fig.).

To sum it up, it is necessary to mark such research significance as part of Astrakhan region industry complex analysis dividing the industrial - resource into districts. Firstly, this kind of division into districts have not been used yet with reference to the region territory; therefore, it has wide practical and scientific - methodical importance. Secondly, the economic assessment of the natural-resource potential will allow to define ways of economic and ecological ranking with the purpose of the perspective revealing and problem regions. Thirdly, the industrial - resource regions structural analysis promotes industrial complex branch direction adjustment and perspective economic development choice for the nearest time.

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## **ВЛИЯНИЕ РЕСУРСНОГО ФАКТОРА НА ПРОЦЕССЫ ФОРМИРОВАНИЯ ПРОМЫШЛЕННОСТИ В АСТРАХАНСКОЙ ОБЛАСТИ**

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В статье представлены основные составляющие природно-ресурсного потенциала Астраханской области Российской Федерации, расположенной на юго-востоке Восточно-Европейской равнины в пределах северо-западной части Прикаспийской низменности, рассмотрено их современное состояние, перспективы развития, влияние на экономическую и экологическую безопасность региона, на основании чего проведено промышленно-ресурсное районирование, в основу которого были положены следующие критерии: внутренние природные и экономико-географические различия между отдельными ее территориями; геологические и геоморфологические условия; состав, размеры, качество и свойство сырья и топлива в пределах месторождения; состав и качество почв для хозяйственного использования; освоенность территории и условия жизни людей; густота транспортной сети; административные границы, как условие грамотной экономической эксплуатации. Анализ этих объектов позволил провести промышленно-ресурсное районирование Астраханской области, в результате которого было выделено пять промышленно-ресурсных районов: Южный, Припойменный, Юго-Западный, Северо-Западный (формирующийся), Северный.

**Ключевые слова:** природно-ресурсный потенциал, промышленно-ресурсное районирование, экономическая и экологическая безопасность региона.

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