

Using the Supply-Chain Management for Developing Oil Industries in the Republic of Kazakhstan

Mugauina R.^{#1}, Madiyarova D.^{#2}, Shishmanov Krasimir.^{#3},

^{#1}*Eurasian national University L. N. Gumilyova, Republic Of Kazakhstan*

^{#2}*Peoples' Friendship University of Russia (PUDN), Russian Federation*

^{#3}*D. A. Tsenov" Academy of Economics Economic Academy, Bulgaria*

Corresponding author: education.com.kz@gmail.com

Abstract- The oil and gas industry is involved in a global supply-chain that includes domestic and international transportation, ordering and inventory visibility and control, materials handling, import/export facilitation and information technology. Thus, the industry offers a classic model for implementing supply-chain management techniques. In a supply-chain, a company is linked to its upstream suppliers and downstream distributors as materials, information, and capital flow through the supply-chain. The purpose of this paper is to investigate the role of supply-chain management in the oil and gas industry. The challenges of a growing innovative economy impose the need to consider the context of the analyzed area with the characteristics of a mono-raw oil and gas group in a sparsely populated territory by supply chain strategy. The paper considers the key factors for reducing costs and increasing the company's profits in managing supply chains: demand management, efficient distribution of petroleum products among customers, better transportation scheduling, warehouse management, and quality and timeliness of information through the automation of the supply chain. Revising the ways to expand the production capabilities will ensure the achievement of sustainable development of the Atyrau region not only in the medium but also in the long-term perspectives when oil is replaced by other sources, which will make the region less attractive for investors. Results show that implementation of supply-chain management in the oil industry can help to reduce costs, increase the company's profits in managing supply, and manage the planning of deliveries.

Keywords; *Development, supply chain strategy, production capabilities, Oil industry, diversification, economic complexity.*

1. Introduction

Supply chains encompass the end-to-end flow of information, products, and money. For that

reason, the way they are managed strongly affects an organization's competitiveness in such areas as product cost, working capital requirements, speed to market, and service perception, among others. In this context, the proper alignment of the supply chain with business strategy is essential to ensure a high level of business performance. The territory of the Atyrau region is 118.6 thousand square km. The distance from Atyrau to Astana is 1810 km. There are 7 districts, 2 cities, 2 villages, 173 rural settlements in the region. The Atyrau region that we are studying makes a significant contribution and serves as one of the largest donors of the republican budget, however, it has low indicators of socio-economic development. This problem is especially significant in the context of developing an innovative economy. As a consequence, there is a question about the paradoxical situation in the region: why the influx of large-scale foreign investments for 30 years did not fulfil the potential of production opportunities and did not turn the region into an economic breakthrough area.

It seems that the economic portrait of the region should be predetermined, first of all, from the viewpoint of improving the life quality of the population of Kazakhstan as a whole, since the region is one of the driving forces of the country's economy.

Meanwhile, the region, in comparison with similar regions of the country, shows worse indicators. For example, the Atyrau region is a part of the "energy" cluster. This ensured the highest GDP per capita, but the region is drastically behind in ensuring access to health care and has differences in the levels of education and gender inequality (WHO).

The experience shows that it is impossible to achieve the economic growth everywhere and equally in all sectors because of its intensity in

different regions as well as difference in sectors. Therefore, most commonly, the so-called regional areas or poles evolve, and the state and regional economic policies contribute maximum to support their development and growth. In international practice, it is known as the policy of polarized development, which distinguishes certain areas where the scale of natural and production potential, the nature of resources, the specificity of the industrial environment, the structure of industries, and geographical location contribute to their regional, area-based high-intensity development.

Effective supply chain management can increase the efficiency and competitiveness of a petrochemical plant and its supply as a whole. In a supply-chain, a company is linked to its upstream suppliers and downstream distributors as materials, information, and capital flow through the supply-chain. So, the purpose of this article is to investigate the need of supply-chain management in the oil industry. Object of the article is oil industry, and subject is supply chain management system in oil industry.

2. Literature review

The study of up-to-date local and foreign scholarly literature in solving the problem showed that from a methodological point of view it is fundamentally important to highlight:

Business processes around the oil supply chain involve a huge amount of communication and common understanding. Major touch points occur at communication points (such as nominations), at agreement phases (such as contracts), at update events (such as pipeline tickets) and at stages in the process where we are trying to think about what our partner might want to do (such as demand planning). The starting point in the field of developing the economic growth poles was the study of the concept of “a growth pole” by [1], who believed to understand the growth poles as compactly placed and dynamically developing industries that generated a chain reaction of the development and growth of industrial hubs.

This theory became a foundation for regional programs in many countries. The key points of this theory are:

1) The growth of the country's economy by supply chain strategy in all regions does not occur evenly, it appears at certain points (growth poles), and then with varying intensity spreads through

various channels and with a certain variable effect - throughout the economy;

2) The growth takes place in the hubs and areas of the economic space. There are the enterprises of dynamically developing industries that produce new goods and services. These are the territories that become attraction poles for production factors, which lead to the cluster of enterprises, the development and growth of industrial hubs;

3) The territories that are in between the growth poles and supply transport communications receive added growth impulses due to increased cargo flows, the diffusion of innovations, and the development of infrastructure. Therefore, they turn into axes (corridors) of development, which jointly with the “growth poles” determine the spatial development framework of the economy of the entire region or country.

Deepening the concept of the growth poles as the world entered the international technological division of [2] wrote that they need to be seen as not only the group of enterprises in leading industries but also as specific human settlements that perform the function of a source of innovation and progress in the economy of a country or region.

The modern scholars [3-5], developing the theory of growth poles, precisely prefer the activation of regional growth areas.

As highlighted by [6], such development mechanisms have existed in the world for several decades, proving their effectiveness.

Thus, the “growth areas” began to mean both the company and the industry, and a set of industries with a strong “entrainment effect” forming “development zones” in the country.

The scholarly literature [7, 8] prove that the use of economic poles as a category, creating a certain integration scheme, allowed institutionalizing the functions of the state in ensuring structural changes in the developed countries.

The analysis of many contexts of the studies showed that the industrial sector was the source of economic growth in many countries, which highlighted it as the main national priority. However, there is a narrowing of its status, handing over the first places to such sectors as services and finance.

At the same time, growth in all cases needs one most important condition: the close cooperation of industry, research, and education, where an impulse to the development of large economic systems bring radical innovations [9].

As a result, the “growth poles” is the cluster of enterprises in certain areas, ensured high growth, entrepreneurial activity, and the innovation process, which are highly intensive” [10].

Therefore, the formation of such zones should be the result of a deliberately pursued state policy. Owing to the support and promotion of creating and developing innovative enterprises, industry, research, and education work in close cooperation within the poles. From this, we can assume that “the growth poles are nothing more than state-stimulated territorial-production associations with a regulated sectoral structure” [11].

3. Materials and Methods

Supply-Chain Link in the Oil and Gas Industry

Exploration → Production → Refining → Marketing → Consumer

The links shown above represent the major supply-chain links in the oil and gas industry. The links represent the interface between companies and materials that flow through the supply-chain. In 1997 Marshall Fisher introduced the revolutionary concept of supply chain segmentation in his famous article "What is the right supply chain for your product? The current business practices in the regional economy have posed a wide range of theoretical and methodological problems. Above all, further study requires the examination of criteria for selecting territories suitable for pursuing a policy of activating growth areas, the development of a mechanism for interaction between central and local regional authorities to activate regional growth areas, and many other problems, the solution of which is necessary to justify and implement a policy of activating regional growth areas.

As a part of the study, it also seems necessary to find measures that can contribute to the expansion and full implementation of the existing, the emergence of new production capabilities and the achievement of sustainable development. It is equally important to assess whether there can still be new growth districts (zones), areas in this territory that can become growth poles.

Thus, we can assume that they can be not only lagging and depressed regions, but also other regions of the country.

It is also important to assess the role and place of the state, which can help polarized development areas, growth poles by investing in infrastructure, participating in research and experimental design

works, providing various benefits to private companies that decide to set up their enterprises there.

As a consequence, it becomes obvious to present the current situation, examine the actual implementation of the adaptation processes of the provisions from a range of economic knowledge to business practices of the Atyrau region of Kazakhstan, identify problems and develop working recommendations.

The study is based on theoretical and methodological preconditions of the theory of development poles, models of their formation, international experience of the current policy.

The informational data resource is from the statistical data of the region, the data from the statistical committee of the country, the information from the government agencies, the materials from the periodical press on the issues related to the study, the materials from the conferences and seminars on the research topic, as well as data from the statistical information portals.

The results of a study of the solution of regional policy issues, conducted by both Russian and Western scholars, showed that the profound study of the essence of this problem created a wide legacy, where the authors developed provisions primarily related to the conceptual and categorical apparatus. Thus, today, the literature has the definitions of “innovative development poles” and “competitiveness poles”, “growth poles”, “innovation poles”, etc.

Meanwhile, the use of management mechanisms in the federal structure of states where almost every region is a constituent entity of the Federation are the bases of the results, and this, fundamentally, does not reflect the situation concerning the regions of the Republic of Kazakhstan, where the degree of autonomy is practically reduced.

Also, the analyzed region belongs to the group of regions with mono-raw oil and gas specialization with a sparsely populated territory, and there are still no studies of such a context in the literature.

Hence, the working hypothesis is to investigate the possibility of incorporating the principles well-known in theory into business practices in a particular region of Kazakhstan and making a fragmentary assessment that reflects the achieved quantitative and qualitative parameters, as well as opportunities and challenges for accelerated development.

Thus, the attempt to present and justify the current state in the development of the region defined the essence of scientific research in this study that we reduced to a consistent reflection of the results:

- examining the provisions of the “pole strategy” theory to find growth poles in the region as a source of innovation and progress and set up the type structure of pro-impulsive, so-called dynamically developing leading industries;

- since all regions of the country have different potentials and are different in type, there is a need for identification, which will allow creating differentiated ways for the development of the object of study;

- also, there is a need to define the quantitative parameters of the emerging structure for consistency with the characteristics innate in the economic growth poles, such as economic growth, entrepreneurial activity, the innovation process, described by high intensity;

- it requires clarification of the activation mechanisms of the pole strategy, embodied in the business practices in several ways. At this point, we consider it right to highlight the possibility of implementation:

- a) market methods or targeted policies pursued by relevant institutions;

- b) many ways of forming the innovative development poles, such as the creation of new industries or “reviving” the existing one;

- c) the possibility of organizing the growth of economic agglomerations in the sectoral (functional) and spatial aspects around the poles (hubs, areas).

4. Results and Discussion

Supply-chain management requires an oil and gas company to integrate its decisions with those made within its chain of customers and suppliers. This process involves relationship management by the company. Both customer relations and supplier relations are key to effective coordination of supply-chains. As a result of the study, we obtained the following results:

First, in the development of the region, the oil and gas industry are the priority number one. As a result of such long domination of energy sources over other sectors of the economy, no significant structural changes occurred and the number of dynamically developing industries producing new goods and services did not develop. Particularly,

when looking at the dynamics of the indicators of the sectoral structure, it is clear that the Atyrau region is in stagnation since even within 16 years starting from the implementation of innovative industrial development in 2003, the ratio between the extractive and manufacturing industries has not changed dramatically. Thus, since the adoption of the R&D program, the share of manufacturing was 9.6%, and only in 2017, it reached 11%.

At the end of 2018, the volume of full-scale production in the Atyrau region reached 7.5 trillion KZT. Monitoring the nature of the region’s economic growth, it can be noted that production in the mining industry and quarrying increased by 11.2%, crude oil production grew by 11.8%; machine-building production volumes improved by 3.9%, and carbonite and oil products by 8.7%. The volume of gross output of agriculture, forestry and fisheries in January-December 2018 reached 67.3 billion KZT, which is 4.6% more than in 2017.

Therefore, the share of energy sectors in the region’s GDP is still predominant and exceeds 35% of the republican indicator.

Calculating the medium-term perspective, we can argue that we do not expect any breakthrough development in the manufacturing sectors due to the next claims.

There is a trend in the region - the share of foreign investments in the total volume of investments in fixed assets in the region is on the wane because there are about 10 years left until the end of investment contracts. So, the share of investments in fixed assets in the region decreased from 68.9 to 49.8%, which is associated with the end of restoration work in Kashagan and the first stage of reconstruction of the Atyrau Oil Refinery (AOR). About 37 billion USD will be spent on the construction of the third phase of Tengiz from 2016 to 2022.

Therefore, for 2019 and 2020, the planned growth rates in the mining industry and quarrying are significantly higher i.e., at the level of 105.2%, while in the manufacturing industry it is at the level of 100.9%. This means that energy carriers dominated over other sectors of the economy and today show most of the revealed comparative advantages (National Human Development Report, Sustainable Development Goals, and development of the regions of Kazakhstan based on their production capabilities, 2016), and even in 2018-2019, the core is still oil products.

Moreover, the policies pursued by the institutions of Kazakhstan govern not only the growth rate but also the same focus in investments when the manufacturing industry sets up lower growth rates. So, following the implementation of the regional program for the development of the region, investments in fixed assets until 2020 will grow owing to the commissioning of new production in these same priority oil sectors. Referring to the expansion of the Tengiz field, attracting investment injections of the manufacturing industry takes third place, and it is also associated with petrochemistry and oil refining.

Secondly, the Republic of Kazakhstan is on the path of rapid modernization, which dictates the need to find innovative ways of implementing development policies of each region in the transition period of the whole country to create an innovative economy.

The use of appropriate cooperation mechanisms, see Table 1 below, under certain conditions can lead to significant economic results [12]

It can be noted that all the above elements of cooperation took place in the region, but they were given a narrow focus, implemented within the oil sector, which excluded a wide range of diversified ties. Particularly, there was little engagement of such areas as “the development of cooperation in the fields of education, science and technology, the conduct of joint scientific and research-based, experimental design works” in the process of transforming the economy of the region. All other directions, however, developed only narrow-profile fields of activity in oil production.

Table 1. Types of activities

1.	creating the conditions for the development of industrial, entrepreneurial, commercial, and other economic activities between organizations;	4	implementing the joint investment projects aimed at the reconstruction and modernization of production, providing deep processing of raw materials and high investment efficiency;
2.	developing the cooperation in the field of education, science, and technology, conducting joint scientific and research-based,	5	assisting to create trading houses, financial and industrial groups and joint production structures that contribute to the development of cooperative, technological and other economic ties;

	experimental design works;		
3.	helping in covenanting and implementing agreements (contracts) between economic entities;	6	cooperating in the training, retraining of research, and working staff, helping in the organization of seminars, conferences, working meetings, exchange of specialists.

Thirdly, the priority of the oil and gas sector made industry enterprises the main players in the market, and they are known to belong to the category of large enterprises. By regions, there are significant differences in the production volumes of large enterprises, which affects the share of small and medium-sized enterprises (SMEs) in the gross regional product (GRP). For example, the production volumes of large enterprises in similar areas are 10 times less than the production volumes of large enterprises in the Atyrau region.

Operational innovation includes a supply-chain management program encompassing the integration and innovation of the process for engaging and communicating with suppliers, and doing so in a way that competitors cannot duplicate or replicate. This requires flexibility along the supply-chain, reflecting a completely new way of interacting with suppliers, a revolutionary rather than evolutionary behavior along the supply-chain. The model used in the development of the economy of the region indicates a tendency towards a model of development at the cost of large enterprises. This situation is due to the influence of geo-economic factors and for the geo-economic potential of the region, it is important to highlight the three most important prerequisites.

The first is because the Atyrau region with its economic potential plays a special role in the development of Kazakhstan since it belongs to the region with fossil resources and energy resources. The area in this context is an integral part of the country, as a major producer and supplier of mineral raw materials, striving to strengthen existing positions in international markets and becoming one of the largest global suppliers.

The second prerequisite is because the region has connection with one of the transport corridors of Kazakhstan - a transcontinental economic bridge of interaction between the European, Asian-Pacific and South Asian economic systems through the mega-project of the SREB. This corridor of cargo

transportation carries out the technological processes of the flow of resources between the West and the East. Therefore, intra-regional and interregional cooperation within the framework of the oil cluster also did not become an effective instrument of regional policy to develop the regions effectively.

Similarly, the cluster approach is also the foundation for the development of the food industry, for the production of building materials, metallurgy, mechanical engineering, and others. Thus, the region is a supplier of industrial and agricultural products and the development of industries. Although the cluster initiative has been implemented in Kazakhstan for a long time, the analysis shows that there are many problems during the implementation of the state innovation policy and cluster development: the insufficient efforts of regional authorities to improve the conditions for innovation, the lack of regional comprehensive cluster development programs, and the lack of qualified specialists, lack of flexible standards, and others.

So, in 2003, the comparative advantages of the Atyrau region made it possible to export forklift trucks, electromechanical tools, soldering, welding machines, warships, rescue boats, floating hospitals, transport ships, and others.

It is already noticeable that the Atyrau region for the period from 2003 to 2017 already lost 4 out of 14 positions in non-oil products, in particular, manufacturing machines, including shipbuilding, which is associated with the loss of their comparative advantages and non-developing industries. The analysis of the product space only in 2015 showed the presence of revealed comparative advantages in only 7 types of products (National Human Development Report, Sustainable Development Goals, and development of the regions of Kazakhstan based on their production capabilities), scattered throughout the product space, with 95% of exports being crude oil and 4% non-crude oil. Also, the loss of position by the region is noticeable in transportation. The decline in the processing industry has led to a general decrease in the level of complexity of the regional economy (Socio-economic policy of the country and the Siberian region in the context of innovative economic development, 2019).

Today, the area produces 46.7% of oil and 35.7% of gas, which is one-third of the total GDP provided by the country's industry. At the same

time, 92% of the export volume of the Atyrau region is crude oil, oil products - 2.6%, liquefied gas, propane, butane - 2.6%, natural gas - 1%, sulfur - 1.4%, other oil products - 0, 04% and other goods - 0.4% [13].

Thus, the calculations performed by the authors during the study showed that these indicators correlate sufficiently, and with an increase in FDI by 1 million KZT, exports will increase by 1.1 million KZT, see Figure 1.

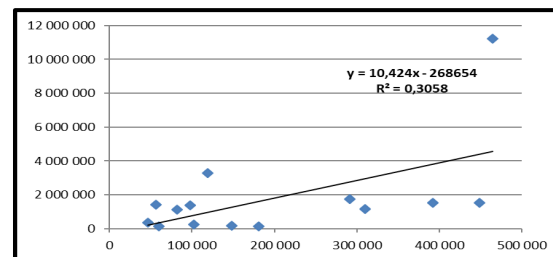


Fig.1. FDI and Export Dependency, million KZT

Such a geo-economic factor gave non-oil sectors a secondary degree to a certain extent.

The industry specialization of the region, as a rule, leads to the fact that larger enterprises (in terms of production volume) of the large business segment will minimize the share of SMEs in GRP. This is the case in the study area, where the low share of SMEs in GRP is determined by the industry specialization of the region, expressed by the number and volume of production of large enterprises. Thus, the share of SMEs in the economy of the Atyrau region is low compared to other regions and equals 14.2% (Three whales of GDP: Kashagan, processing and infrastructure).

According to the results of the analysis, to increase the share of SMEs in the region's GRP, it is important to have business consolidation in the segment of small and medium enterprises.

Is this possible in this area? We believe that in the area of SMEs it focuses on the domestic economy and mainly covers trade and services. "If we take business, at least trade, out of the shadows, we probably will not need oil in the country".

The study shows that if the average small and medium-sized enterprises have a larger volume of production than the average country, this means that the industry in the region is successfully developing in the segment of small and medium-sized enterprises. This is the reason for the increase in the share of SMEs in GRP, which is not the case in this area.

Micro and small enterprises develop on their own and the state does not affect the process of enlargement of SMEs. As a matter of the fact, micro-enterprises should have grown into small and small enterprises into medium-sized enterprises within 30 years of such an influx of investments. Medium-sized enterprises, as a rule, are information technologies; education most often covers the sphere of professional services.

The formation of development zones should be the result of a deliberately pursued state policy and the formation of a regulated sectoral structure. Moreover, the indicators of economic and social development determine the development efficiency of any region

The level and dynamics of the processes of socio-economic development are determined by calculating the integral development indicators in the following areas: economic development; human development; territorial development; and security.

As noted above, the high intensity of economic growth, entrepreneurial activity, and the innovation process will take place only if there is a real convergence of industry, research, and education. The region occupies one of the lowest places in the ranking of innovative development.

The innovative activity of enterprises is a multi-stage aggregate system of measures, which affect successful commercialization of goods. Innovation activity is an activity that aims to have research and development, as well as invests in development to create a new good with a high degree of competitiveness.

The indicator “the number of created and used modern technologies and equipment objects” shows how much the region’s enterprises either create own technologies and apply them in production or import foreign technologies and apply them. The Figure 2 shows the level of development of this area for this indicator.

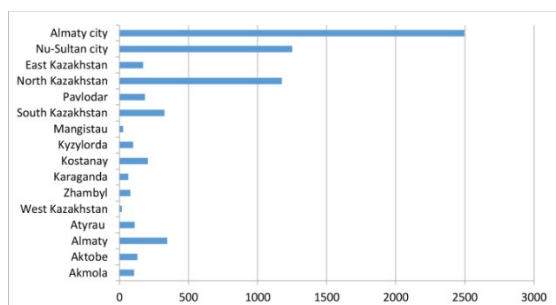


Fig. 2. The development of the indicator across the country

The calculations performed by the authors confirm these cases as there is a weak correlation between FDI and the cost of product innovation. Between the volume of produced innovative products and costs the correlation is almost imperceptible, and with an increase in the volume of produced innovative products by 1 million KZT, exports increased by only 393 million KZT, see Figure 3.

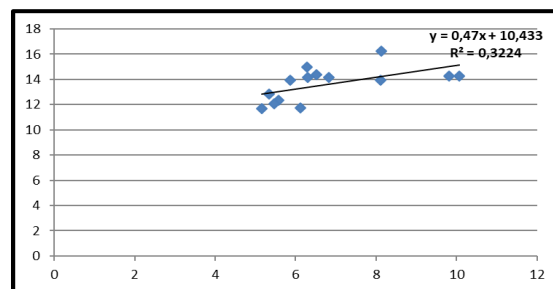


Fig. 3. The share of innovative products and Export Dependency, million KZT.

We assume that this is because of the dispersion of comparative advantages in the region along the periphery of the product space. This situation slows down and complicates the process of the development of production capabilities due to the lack of products found close by the identified comparative advantages.

The reasons are, on the one hand, the region has focally weak population density, small city centers, income gap, and the high share of the poor, low human capital, underdeveloped infrastructure, and water shortages. Meanwhile, the measures taken in the region were insufficient and could not contribute to the emergence of new production capabilities and sustainable development. On the other hand, in creating conditions for interregional competition, the region also did not take proper measures to increase the efficiency of production allocation and perfect the structure of displacement and labour markets.

Therefore, the region has not progressed for 30 years towards creating the elements of a multifunctional industrial-agrarian region or a region that has the grounds of modernized economy and developed service sectors.

As we look ahead, the loss of oil as the main energy resource will lead the Atyrau region to serious negative consequences by 2030.

5. Conclusions

The Oil and Gas (O&G) industry supply chain comprises of diverse vendors, manufactures and agencies that handle businesses such as upstream exploration and production, midstream catchment areas, downstream refined products manufacturing, whole sale and bulk distribution terminals, and retail delivery units. The supply chains of this industry is highly complex and needs specialized practitioners to manage the applications that help run the business. Often regional authorities adopt such a factor of supply chain strategy as the availability of production capabilities as the foundation for the adopted development strategy, leaving aside the parameters of human development and sustainability [14].

The low level of diversification and economic complexity specific to the region is a consequence of excessive concentration on the export of raw materials. According to the Agency of Statistics of the Republic of Kazakhstan, in the total volume of trade, the share of exports reached 92% or about 27.5 billion USD. While the volume of import was only 8%, that is more than 2.5 billion USD. This means that the planned measures in the future will not entail a significant increase in the level of complexity of the entire economy.

On the other hand, the import structure has more dominating tax-intensive goods: such as 59.3% of goods from the “Equipment and Mechanisms” groups and 17.7% of “Products from ferrous metals”, 6.3% of “Chemical industry products” and others. For example, the number of goods from the groups “Wood and wooden products” and “Plant products” reached 0.4% of total import [13].

The paper deals with business renovation, the effective utilization of information technology and the role of business process modelling in supply chain integration project in oil industry. The main idea is to show how the performance of the supply chain can be improved with the integration of various tiers in the chain. Finding production capabilities outside the extractive industries is crucial for the Atyrau region, which will help reduce its dependence and vulnerability to external shocks. This shows great opportunities in the development of the non-oil sector.

From the oil exploration stage to the end user, there needs to be an all-inclusive supply chain model that captures the critical components and all the data in the system. Analyzing this data can

illuminate issues and opportunities that can be addresses at various stages of development, production and distribution. Overall, the region has a limited ability to improve product space due to the insufficient gross agricultural product in processing.

The possible specializations of the regional economy include such industries as ore beneficiation, the production of building materials for the Western zone. A cluster of services for the fuel and energy complex, a wide network of hotels, recreation, vocational education, sea transport services, cargo handling, as well as mass services can be extremely attractive. As a positive example, we can mention the launched “Bolashak” oil refinery with a capacity of 450 thousand barrels per day. It also extracts liquefied gas and sulfur. There is a plan that the plant will export about 1 million tons of sulfur per year. Without diminishing the significance of this factor, at the republican level, we recommend detailing it at the level of regions and their districts. The parameters to achieve human development and sustainability require the choice of active policies based on the best world practices, as well as a range of approaches that allow, first of all, achieving the level of republic-wide and then international standards. A well-integrated supply chain management systems can ensure healthy cross-functional data exchange and cataloguing for implementing best practices and bringing in additional savings by improving the planning efficiency in oil industry.

REFERENCES

- [1] WHO. The aims of the healthcare in the framework of SDG, Goal 3. Retrieved from who.int/topics/sustainable-development-goals/targets/ru/
- [2] E.I. Antonova, “*Potential points of economic growth and their relationship with the problems of economic development*,” Modern problems of economics and national economy management: Set of scientific publications of aspirants of Saint Petersburg State University of Engineering and Economics. Saint Petersburg: Saint Petersburg State University of Engineering and Economics, 2006.
- [3] O.E. Gerasimova, “*Some issues of spatial polarization control in the region*,” Socio-economic processes and phenomena, Vol. 3, pp. 42-49, 2008.

- [4] A.S. Molchan, L.I. Trinka and E.V. Lehman, "Foreign economic activity as a factor in the sustainable development of the region's economy." *Scientific journal KubSAU*, 3, pp. 1-11, 2014. Krasnodar: KubSAU.
- [5] V.E. Rokhchin, S.F. Zhilkin and K.N. Znamenskaya, "Strategic planning for the development of Russian cities: a systematic approach," Saint Petersburg, p. 40, 2004.
- [6] A. Kudinov, "Growth poles," Information and political portal", 2009. Retrieved from <http://www.doc22.ru/information/analysis/462-2009-06-02-02-19-20>
- [7] V.N. Vysotsky and A.Ya. Yakobson, "On foreign concepts of polarized development. Proceedings of the Siberian Branch of the USSR Academy of Sciences," Social science series, Vol. 6, No. 2, pp. 100-106, 1976.
- [8] S.Yu. Glazyev, "The theory of long-term technical and economic development," Moscow: VlaDar, 1993.
- [9] Yu.A. Karmyshev, "On potential sources of innovative development of depressed regions of Russia," *Economics and Management*, 1, p. 52, 2005.
- [10] B. Ergashev, A. Khashimov and Z. Davydova, (n.d.). "Growth poles: what should they be?", *Economic Review*. Retrieved from <http://www.review.uz/ru/article/175>
- [11] National Human Development Report, Sustainable Development Goals, and development of the regions of Kazakhstan based on their production capabilities. "Published by the UN Development Program," 2016.
- [12] Socio-economic policy of the country and the Siberian region in the context of innovative economic development. Part 1 ICNPE. Barnaul, October 26-77. 2019.
- [13] D. Tasymov, "The export volume of the Atyrau region increased by 40%," 2019. Retrieved from <https://kursiv.kz/news/ekonomika/2019-01/obem-eksporta-atyrauskoy-oblasti-uvlichilsya-na-bolee-chem-40>
- [14] L.G. Batrakova, "Institutional Foundations of Advanced Development Economics: Proceedings from the International Scientific and Practical Conference from 18 March 2019," Yaroslavl: Publishing Department of Yaroslavl State Pedagogical University. 2019.