

## **IMPACT OF LEGAL STANDARDS ON LOGISTICS MANAGEMENT IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT**

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**Abstract:** In the global context, logistics plays a key and sometimes a decisive role in the industrial development of countries. The legal regulation remains one of the important ways to solve the logistics tasks by enterprises efficiently. The purpose of this study is to assess the impact of legal norms on logistics of enterprises to support sustainable development. The article examines the state of logistics in the members of the Commonwealth of Independent States and their legal norms that affect the countries sustainable development. The research methodology is a survey of companies' managers and lawyers. The Kruskal-Wallis test, ANOVA analysis, Tukey's HSD test are used. Logistics management in enterprises should contribute to the protection of both environmental and social sustainability, because the growing number of customers supporting socially responsible enterprises is observed.

### **1 Introduction**

The development of supply chains regulation methods in logistics, including the regulatory framework, has direct and indirect impact on the activities of logistics entities, creation of document flows, implementation of logistics operations and functions. Logistic activities are subject to existing laws and by-laws, and there is also a need for methods of centralized, unified regulation of logistics chains as a set of subjects, objects, and logistics activities to promote material, information, financial, and other flows from the starting point to the destination. The logistic approach to managing economic processes is based on the operation of information standards, business and other regulatory acts in the field of logistics. Today, all countries of the world must comply with international and national laws and regulations. There are several international standards and regulations that are likely to be followed soon by all companies. One example is the United Nations Framework Convention on Climate Change, whose goal is to decrease atmospheric greenhouse gas concentrations. Currently, this task is the most urgent for all companies in order to timely react, meet all legislative, and market requirements. In particular, they have to develop environmental programs and collaborate with the government to improve the environmental guidelines and standards.

### **2 Literature review**

Paradigm of sustainability is supposed to base all human actions. It "pervades the environmental, social, political, economic and cultural discourse from the local to the "global" level in both the public and private sectors" [1]. Self-regulation of social and environmental impacts by enterprises is being promoted as a solution to the regulatory problems that developing countries face. The international legal norms can help governments of developing countries since the globalization brings many potential opportunities for businesses in developing countries [2]. At the same time, this creates a significant regulatory problem. In recent years, pressure has increased on private sectors to take responsibility for social and environmental issues. The critical attitude towards private enterprises and their impact on society often prevail. To solve this ambiguity, the International Organization for Standardization has published a standard that contains recommendations for integrating social responsibility into governance processes [3]. The international standards can improve the accountability, promote and guide corporate responsibility, provide enterprises with ways to systematically evaluate and measure their social and environmental parameters [4]. Over the past few years, due to global changes, many researchers expect new directions in the management of enterprise logistics. Guoyi and Chen [5] argue that, with the advent of new economies such as the information economy and network economics, logistics has gained new knowledge, new technologies and new managerial thought,

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and the logistics industry is developing in the direction of specialization and scale. New technologies can affect the industry structure by creating new sectors or eliminating others [6]. But with the increase in the volume of logistics, changes in logistics management and a wide range of logistics tools and instruments, the environmental impact of the logistics system is becoming more serious. In their studies, Kovács and Kot [7] define logistics as the planning, organization, and coordination of flows of materials, information, energy, money, and values within a logistics system. As Jigang [8] pointed out, logistics is now playing an increasingly important role in economic and social development, the rapid growth of science and technology and the growth of the global economy. The development of logistics is also very important for improving the quality and efficiency of the national economy, optimizing the distribution of resources, improving investment conditions, promoting industrial restructuring and increasing economic power. The importance and influence of logistics is also noted by other authors and states that the quality and accessibility of the services offered by the logistics sector are of great importance for economic growth and increasing the employment potential, as well as the ecological situation of the country [9-11]. Ming-Lang and other researchers [12] emphasize that the industrial sector, thanks to its role in society, has made a significant contribution to environmental pollution and its operation. The rapid industrialization of many countries in Asia and, accompanied with increasing levels of water, air and land pollution raise concerns about the volatility of current growth patterns. Effective supply chain management is, in particular, to ensure the highest possible quality of customer service and the desire to minimize costs arising from the flow between the links [13]. The greening of supply chain management complies with environmental, social and ethical standards in supply chains. For example, the ongoing promotion of Chinese cleaner production strategies is mainly based on the Cleaner Production Promotion Act of China. The concept of Cleaner Production is accepted by the United Nations as a holistic approach of a "source-oriented preventive thinking". [14]. Tightening greenhouse gas emission standards in Asia put also increasing pressure on petrochemical and steel industries in Korea [15]. Sustainable industrial development of the Republic of Kazakhstan requires new legal norms that will regulate all these sectors. Therefore, innovation and logistics management are becoming the basis for the company's development in Kazakhstan [16] as one of the priority sectors of the economy is industry. The positive dynamics of the economic and social subsystem, but the negative environmental subsystem in one of the largest cities of Kazakhstan also deteriorate the sustainable development [17]. When consumers optimize their

behaviour by maximizing the utility from consumption legal regulation can help to predict their behaviour [18].

**2.1 The importance of legal standards in logistics management in the CIS countries**

The business environment in Kazakhstan is relatively stable and transparent compared to other countries of the Commonwealth of Independent States (CIS). As a country in transition, both internal stakeholders and the government continue to pay more attention to the economic and legal responsibility for the sustainability of business organizations. Civil society and non-governmental organizations, on the other hand, argue that business organizations should focus more on ethical and discretionary responsibilities in Kazakhstan [19]. In Kazakhstan, a new law on the green economy is currently being approved by the Parliament. The law contains all the previously adopted rules for the use of renewable energy sources and provides a new regulatory framework. In particular, the law guarantees the connection to the grids, its use and expansion of the grids for renewable energy producers [20]. Sustainable development is necessary to achieve the goals of the Development Strategy of Kazakhstan until 2030, and Kazakhstan is a member and an active participant in the UN Commission on Sustainable Development, the Environment for Europe and Environment and Sustainable Development for Asia processes, the regional Eurasian network of the World Council of entrepreneurs for sustainable development. Based on the German sustainable development strategy, which is based on the EU sustainable development plan, five areas of activity are identified: reducing transport and emissions, reducing land use, choosing a carrier taking into account sustainable aspects, constantly improving working conditions and continuing education [21]. The impact of logistics on the competitive advantage of the parties, as well as the risk associated with changing working conditions, increase the importance of trust in a partner [22]. Sustainable logistics – one of the topics mentioned in the Sustainable Development Strategy - propose many strategies and practices that can support sustainable development [23]. The vast territory of Kazakhstan and small population make integration and globalization as one of the priorities in the country's development. The freight turnover of transport enterprises (without pipelines) on average in the CIS countries is growing every year. The leaders among the CIS are Kazakhstan, Belarus, Uzbekistan. Cargo turnover in Kazakhstan has grown over the past 10 years from 369.8 billion ton-km by 61.2% to the level of 596.1 billion ton-km in 2018. Income of enterprises in the past year amounted to 250.4 billion tenge, including from the transportation of goods - 148.9 billion tenge (the entire amount falls on freight road transport) and 101.5 billion tenge (Figure 1).

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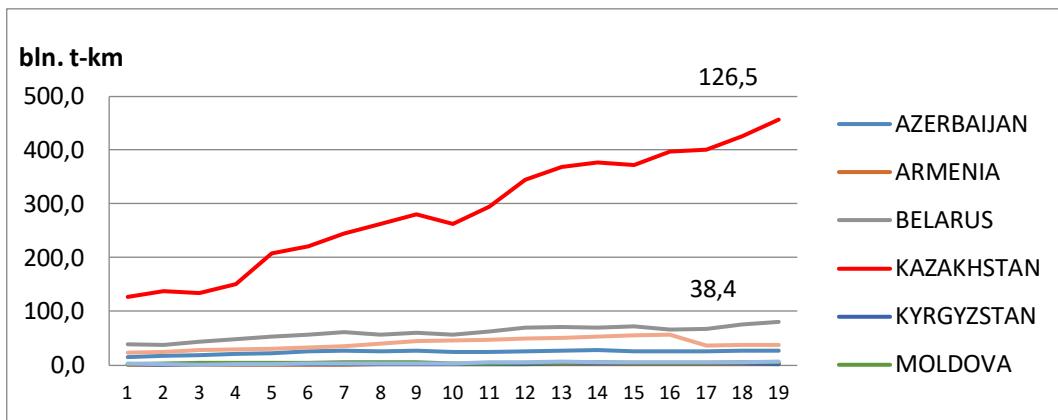


Figure 1 Freight turnover of transport (excluding pipelines)

UNCTAD is supporting the sustainability of freight transport systems based on data from relevant research and analytical work, as well as strategic recommendations based on consensus building and field experience. The main tools and mechanisms developed by UNCTAD to facilitate the transition to sustainable freight transport systems are presented in the UNCTAD Sustainable Transport and Finance Toolkit and include a methodology for assessing gaps and expanding the capacity to plan, develop and implement strategies for sustainable transport and finance; a package of training and capacity-building measures, including case studies, best practices and

resources; and an online portal to facilitate the exchange of information and partnerships. All three components are flexible and allow you to make innovative solutions that are appropriate to local conditions and the specific needs of users. The flexibility of these tools makes it possible to set priorities and goals, taking into account the special criteria and needs of various beneficiaries [24].

Mining industry is the most profitable for the economies of CIS countries. The largest taxpayers of the CIS countries are mining enterprises and these payments are growing from year to year (Table 1).

Table 1 The largest enterprises are taxpayers of the CIS

No	Country	Industry	Company
1.	Russia	Oil and gas	PJSC Rosneft Oil Company
2.	Kazakhstan	Oil and gas	Tengizchevroil LLP
3.	Kyrgyzstan	Mining industry	CJSC Kumtor Gold
4.	Belarus	Gas industry	OJSC Gazprom Transgaz
5.	Armenia	Industry	Zangezur Copper-Molybdenum Plant
6.	Uzbekistan	Mining industry	Navoi Mining and Metallurgical Plant

According to the CIS International Statistics Committee, the largest oil producing countries are Kazakhstan first, Azerbaijan is second, and Uzbekistan is third (Figure 2).

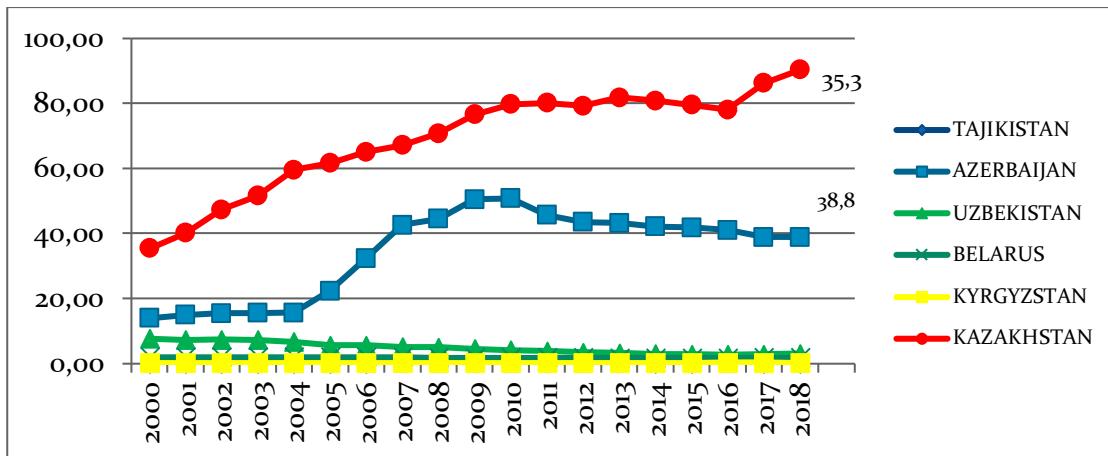


Figure 2 Production of petroleum, mln. tenge

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The bulk of the country's budget in 2018 was made by enterprises involved in oil and gas extraction. Last year, oil and gas companies in Kazakhstan provided 87% of the country's 30 largest taxpayers tax revenues. In with these indicators, it can be revealed that, each year, the volume of new industrial waste is growing. In connection with the development of the mining, processing and heavy industries, Kazakhstan produces significant volume of industrial waste that must be managed in accordance with international best practice. At the same time, these efforts often generate considerable environmental conflicts, decreasing the sustainability of the environment [25]. Thus, Kazakhstan actually needs to rebuild an integrated waste management system, since the organizational and legal framework, in fact, are absent. There are not enough norms for rational waste management, and responsibility for the construction and operation of an integrated system is not distributed. "The Kazakhstan-2050 Strategy: a New Political Course of a Successful State" sets clear guidelines for building a stable and effective model of the economy based on the country's transition to a green development path.

### 3 Methods

Online survey method is used to study the attitude of stakeholders to the logistics management and legal requirements. The questionnaire is compiled for two interested parties - lawyers and managers. The questionnaire includes information on international standards applicable to support sustainable development, on legal norms affecting logistics management, an assessment of new principles introduced into management in connection with sustainable development. The asymmetric 5-point Likert scale is taken to measure the relative importance of each statement: 1-Unimportant, 2-Not very important, 3-Moderately important, 4-Important, 5-Very important. Statistical tests are powerful data analysis tools. To obtain a significant difference, the Kruskal-Wallis test is used. The Kruskal-Wallis test is a nonparametric alternative to the one-way ANOVA test for independent measurements. It is based on ranking data, not on calculations using averages and variances. The Kruskal-Wallis test is a nonparametric statistical test that evaluates whether two or more samples are taken from the same distribution. It is commonly used in various fields [26]. One-way ANOVA analysis is used to assess the marginal discrepancy between groups, and Tukey's HSD criterion was used for comparative studies. The Tukey multiple comparison test is used to determine which group the difference arises from as a result of the one-way ANOVA. In addition, logistic regression analysis can be used. Logistic regression is used to predict the likelihood of an event from the values of many features. Multilevel models of logistic regression make it possible to take into account the clustering of subjects in clusters of units of a higher level when assessing the impact of the characteristics of the

subject and the cluster on the results of the subject [27]. The questionnaire is compiled in Russian, since Russian is the generally accepted language of communication in Kazakhstan and the CIS countries, but the questionnaire was translated into English to check for inconsistencies and possible translation errors. Online - questionnaire was sent to more than 400 respondents. To identify accurate results, an equal number of two groups was used, and additional questions were added to the company's managers to assess the importance of the legal norms of sustainable development for their enterprise.

### 4 Results

The total number of respondents is 214. Of these, 125 respondents are lawyers, 89 respondents are company managers. The survey participants 57% are women and 43% are men. 56% were from the public sector and 44% from the private sector. Of the private sector, 33% are international companies, 17% are joint-stock companies, 46% are limited liability partnerships.

According to the questionnaire, the answers of the respondents of two groups to the question on the impact of international standards on logistics management in the field of sustainable development, which can successfully influence, gave a significant difference in the results of the Kruskal-Wallis test. Enterprise managers pointed that international standards that are not laws, they do not oblige enterprises to fully implement the norms. Most lawyers pointed that international standards are mandatory requirements. According to lawyers a company can achieve its goals with the help of obligations. The p-value is 0.00114 (Table 2). The result is significant at  $p < 0.05$ . 46% of the total sample support international standards and "light" laws, 54% support international laws and mandatory laws (Figure 3).

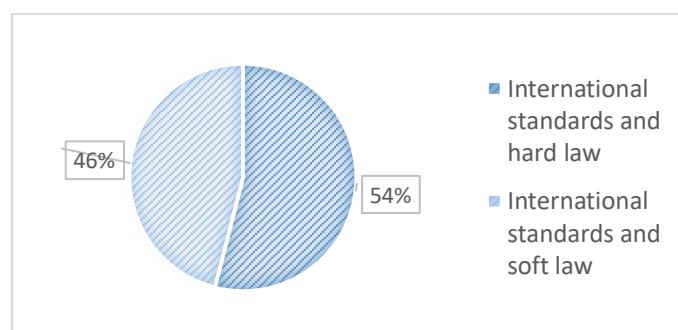


Figure 3 The impact of international standards and legal norms on logistics management

44% of the total number of respondents assessed necessity to change the traditional methods of logistics management as "moderately important". In relation to two groups, it is "very Important" for 61% of lawyers, 39% - for enterprise managers. The difference between the two groups is confirmed by One-way ANOVA and Tukey's HSD Test.

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*Table 2 The statistics values*

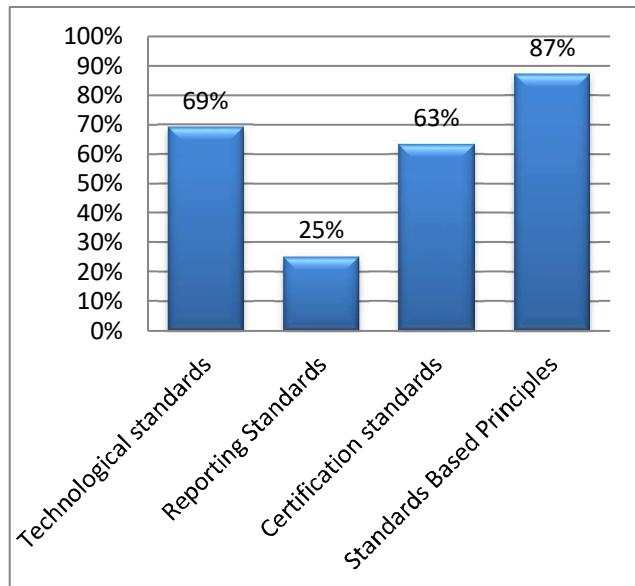
Source	Sum of squares SS	Degrees of freedom vv	Mean square MS	F statistic	p-value
Between-treatments	10.8764	1	10.8764	6.3249	0.0128
Within-treatments	302.6517	176	1.7196		
Total	313.5281	177			

The f-ratio value is 6.32492. The p-value is 0.012801. The result is significant at  $p < 0.05$ . The p-value corresponding to the F-statistic of one-way ANOVA is

*Table 3 The results of the statistics*

Treatments pair	Tukey HSD Q statistic	Tukey HSD p-value	Tukey HSD inference
Managers and Lawyers	3.5567	0.0128028	$p < 0.05$

The study of standards implies not only a consideration of their adoption and production, but also a study of their role and contribution to global economic governance, as well as their attitude to more stringent forms of law. The study of important aspects, which should include legal norms to increase the efficiency of enterprise logistics management has shown the following results: 87% - show the principles based on standards, in second place 69% - technology standards, 63% - certification standards, 25% - reporting standards (Figure 4). Typically, the enterprises introduce only the minimum mandatory changes according to national environmental regulations.



*Figure 4 Aspects that should include legal provisions*

Answers of company managers an assessment of the importance of the legal norms of sustainable development for their enterprise gives the following results: most managers of them 42% - "Moderately important", 38% - "Important", 19% - "Not important". According to the

lower than 0.05, suggesting that the one is significantly different (Table 3).

survey results, legal norms to improve efficiency is one of the main principles of companies. To the question "what do their company do to achieve their goals by legal norms" the following answer options were offered: provide resources to the company - strategies, management provide favourable conditions due to the pressure from the government, with the help of the cultural characteristics of the company, compliance with norms and adoption of environmental standards. Most managers (40%) indicated the culture of the company, 24% indicated the company's strategy, 36% - indicated legal requirement. Business see environmental regulation as unjustified economic burden that threatens its profitability, while competitive groups pay considerable attention to the adoption of environmental laws. Obviously, the market is changing the course of development in managing the enterprise and in all its activities.

## 5 Discussion and Conclusion

The concept of sustainability encounters widely into legal framework. It is reflected in an increasing number of international official documents. The legal nature of sustainable development depends on two preconditions: legal sphere and penetration into one of the recognized sources of international law. Companies can no longer ignore environmental changes and must be prepared for all new market conditions. According to the results of the questionnaire, enterprise managers and lawyers believe that, for effective logistics management and for maintaining the country's sustainable development, international standards that are characteristic of light legal norms are most influential. The reporting on sustainability support reflects global best practices for publically economic, environmental, and social impacts [28]. As indicated by respondents Principles based on international standards should be integrated into legal norms for effective management. The respondents make it clear that any country has its own characteristics and different legal

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norms that must be taken into account. Development of logistics in the CIS countries takes place in accordance with international principles but has its own characteristics. Lawyers consider changing the traditional management approaches according to the requirements of legal norms to be very important, but at the same time it remains moderately important for managers. The people of Kazakhstan are accustomed to live in strict rules and regulations, and state legislation always gives priority to everyday life. Technological standards are an important aspect of the rule of law that supports sustainable development. Current research has some limitations. First of all, the data used can reduce the accuracy of forecasting. Secondly, among the participants there are only enterprise managers and lawyers who make the result quite difficult to generalize. Further research will help overcome this shortcoming by using longitudinal data to improve the accuracy of forecasting the impact of international standards and legal norms on logistics management.

## References

- [1] BARRAL, V.: Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm, *European Journal of International Law*, Vol. 23, No. 2, pp. 377- 400, 2012.
- [2] DAVID, G., NGAIRE W.: Making corporate self-regulation effective in developing countries, *World Development*, Vol. 34, No. 5, pp. 868-883, 2006.
- [3] HAHN, R.: Standardizing Social Responsibility? New Perspectives on Guidance Documents and Management System Standards for Sustainable Development, *IEEE Transactions on Engineering Management*, Vol. 59, No. 4, pp. 717-727, 2012.
- [4] GILBERT, D., RASCHE, A., WADDOCK, S.: Business Ethics Quarterly: Accountability in a Global Economy: The Emergence of International Accountability Standards to Advance Corporate Social Responsibility, *Business Ethics Quarterly*, Vol. 18, No. 1, pp. 290-292, 2015.
- [5] GUOYI, X., XIAOHUA, Ch.: Research on Green Logistics Development at Home and Abroad, *Journal of Computers*, Vol. 7, No. 11, pp. 2765-2772, 2012.
- [6] TILABI, S., TASMIN, R., TAKALA, J., PALANIAPPAN, R., AZIATI ABD HAMID, N., NGADIMAN Y.: Technology development process and managing uncertainties with sustainable competitive advantage approach, *Acta logistica*, Vol. 6, No. 4, pp. 131-140, 2019. doi:10.22306/al.v6i4.140
- [7] KOVÁCS, G., KOT, S.: New logistics and production trends as the effect of global economy changes, *Polish Journal of Management Studies*, Vol. 14, No. 2, pp. 115-126, 2016.
- [8] JIGANG, W.: Logistics development strategy in China, *Market weekly*, Vol. 5, pp. 38-41, 2009.
- [9] SPERANZA, G.: Trends in transportation and logistics, *European Journal of Operational Research*, Vol. 264, No. 3, pp. 830-836, 2018.
- [10] KARCZ, J., ŚLUSARCYK, B.: Improvements in the quality of courier delivery, *International Journal for Quality Research*, Vol. 10, No. 2, pp. 355-372, 2016.
- [11] MAN, M., MODRAK, V., GRABARA, J.: Marginal cost of industrial production, *Polish Journal of Management Studies*, Vol. 3, No. 1, pp. 62-69, 2011.
- [12] MING-LANG, T., SHUN FUNG, C., RAYMOND, R., TAN, A., SIRIBAN, M.: Sustainable consumption and production for Asia: sustainability through green design and practice, *Journal of Cleaner Production*, Vol. 40, pp. 1-5, 2013.
- [13] KOT, S., GRONDYS, K., SZOPA, R.: Theory of inventory management based on demand forecasting, *Polish Journal of Management Studies*, Vol. 3, No. 1, pp. 148-156, 2011.
- [14] ZHU, Q., SARKIS, J., CORDEIRO, J.J., LAI, K.H.: Firm-level correlates of emergent green supply chain management practices in the Chinese context, *Omega*, Vol. 36, No. 4, pp. 577-591, 2008.
- [15] LEE, S.Y.: Existing and anticipated technology strategies for reducing green house gas emissions in Korea's petrochemical and steel industries, *Journal of Cleaner Production*, Vol. 40, pp. 83-92, 2013.
- [16] GRABARA, J., CEHLAR, M., DABYLOVA, M.: Human factor as an important element of success in the implementation of new management solutions, *Polish Journal of Management Studies*, Vol. 20, No. 2, pp. 225-235, 2019.
- [17] ALIBEKOVA, G., PANZABEKOVA, A., SATPAYEVA, Z., ABILKAYIR, N.: Sustainable development issues of Almaty as the largest metropolis in Central Asia, *IOP Conference Series: Earth and Environmental Science*, Vol. 177, No. 1, pp. 1-6, 2018.
- [18] MCADAMS, R.H., NADLER, J.: Coordinating in the Shadow of the Law: Two Contextualized Tests of the Focal Point Theory of Legal Compliance, *Law & Society Review*, Vol. 42, No. 4, pp. 865-898, 2008.
- [19] KARATAYEV, M., MICHELE, L., CLARKE, A.: Review of current energy systems and green energy potential in Kazakhstan, *Renewable and Sustainable Energy Reviews*, Vol. 55, No. C, pp. 491-504, 2016.
- [20] RUDOLF, O.L., NIKOLAI, K., RAHEL, K.H.: Procurement of logistics services and sustainable development in Europe: Fields of activity and empirical results, *Journal of Purchasing and Supply Management*, Vol. 19, No. 3, pp. 122-133, 2013.
- [21] MALKUS T.: The influence of trust on reduction of cooperation risk in logistics, *Acta logistica*, Vol. 5, No. 3, pp. 93-99, 2018. doi:10.22306/al.v5i3.101
- [22] KUDLA, N.L., KLAAS-WISSLING, T.: Sustainability in shipper-logistics service provider relationships: a tentative taxonomy based on agency theory and stimulus-response analysis, *Journal of Purchasing and Supply Management*, Vol. 18, pp. 218-231, 2012.
- [23] UNCTAD: *Sustainable freight transport and finance toolkit*, [Online], Available: <https://unctad.org/en/Page>

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- s/DTL/TTL/Infrastructure-and-Services/SFTF- Toolkit.aspx, [05 Jan 2020], 2018.
- [24] AMBRIŠKO, L., GRENDL, P., LUKÁČ, S.: Application of logistics principles when designing the process of transportation of raw materials, *Acta Montanistica Slovaca*, Vol. 20, No. 2, pp. 141-147, 2015.
- [25] LAKNER, Z., KISS, A., MERLET, I., OLÁH, J., MÁTÉ, D., GRABARA, J., POPP, J.: Building coalitions for a diversified and sustainable tourism: Two case studies from Hungary, *Sustainability*, Vol. 10, No. 4, pp. 1-23, 2018.
- [26] SUXIN, G., SHENG, Zh., AIDONG, Zh.: Privacy-preserving Kruskal-Wallis test, *Computer Methods and Programs in Biomedicine*, Vol. 112, No. 1, pp. 135-145, 2013.
- [27] AUSTIN, P.C., MERLO, J.: Intermediate and advanced topics in multilevel logistic regression analysis, *Statistics in Medicine*, Vol 36, pp. 3257-3277, 2017.
- [28] SUTOPO, B., KOT, S., ADIATI, A. K., ARDILA, L. N.: Sustainability Reporting and value relevance of financial statements, *Sustainability*, Vol. 10, No. 3, pp. 1-14, 2018.

**Review process**

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