



## SIGNIFICANCE OF INTERNATIONAL LOGISTICS DEVELOPMENT

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**Abstract.** The article analyzes the importance of development of international relations, exchange of innovations, products and services as a very important logistics solutions and logistics business development. Using the latest research and knowledge in the application of the idea of sustainable development in the logistics business activities, seeks to encourage their development (LPI). The authors provide the universal model of sustainable development and logistical organizational relationships in organization, which could be successfully used for organization management by any manager who has appropriate theoretical and practical background. On this model there are three levels: ecological, economical and social. In all these levels are some realistic criteria's for sustainable development in logistic organizations.

**Keywords.** Innovation, international business, logistics, logistics companies, logistics performance index (LPI), modern technologies, the sustainable development of logistics organizations.

### Introduction

Observed rapid Lithuanian economic development best describes the generated high GDP growth rate, increasing industrial production sales volumes and rising corporate profitability. All this shows an ability to adapt to difficult conditions in the international economic environment, but also successes, fostering faster sustainable economic development not only in the Lithuanian industry and different business areas. Important factors for achieving high growth rates and ensuring the required level of sustainability, there are innovation, new technologies, modernization of the company, organization of the production process, the investor an opportunity to conduct a shortest possible time and in a proper transport system functioning.

An integration of Lithuanian transport system into the single European transport system - one of the additional opportunities to attract transit traffic, cargo temporary storage logistics centers and terminals, as well as to form a rational transit transport policies and to implement one of the EU's internal market principles, that is, mutual recognition principles, ensuring free trade and services. After the evaluation of the transport system missing links in the installation, in order to effectively and fully integrate into the EU transport system, transport terminals

and logistics centers is one of the key areas requiring maximum utilization of the potential of the country, serving international cargo flows.

This article identifies sustainable development ideas adaptability of logistics companies. Frequently concept of sustainable development limited of global, national or regional level, still the case that a particular organization is trying to implement sustainable development principles into practice, analysing how a particular branch of the business seems to sustainable development context.

The aim of the article after infrastructure development and logistics performance index data analysis, provide logistical business development opportunities through sustainable development model. Paper briefly examines evolution of logistics system and discusses integrating combined freight carriage into international logistics system. To determine countries' ability to trade globally, data from the Logistics performance index (LPI) is described to measures logistics efficiency. Concluding remarks are presented using modelling method, summarizing theoretical and empirical results.

### Evolution of Logistic system and Perspective of Infrastructure Development

Logistic systems and business networks strategic integration in current fast-moving scenario as well as the diversi-

ty impact on competitive advantage will be circumscribed through a descriptive model. Potential absorptive capacity (Zahra, George 2002) is increasingly relevant in dynamic marketplaces where abundance of information does not necessarily leads to strategic knowledge. In fact, the scenario in which logistic systems within global supply chains take place could be also characterized by the challenging international environment and the diversified national contexts.

Logistic system's potential absorptive capacity refers to the capability of recognizing the value of new information, assimilate and integrate it in order to be applied to commercial ends. It is segmented in identifica-

tion and obtainment (influenced by awareness), and integration (long-term learning).

The integrative segment could be characterized by the aims of creating new competences and tacit/explicit knowledge, changing ingrained mental models and evolving strategic flexibility. In fact, the scenario in which logistic systems take place is characterized by challenging international environment and diversified national contexts. Individuals' background provides essential awareness to sense and deal with external circumstances and knowledge. The descriptive model (Figure 1) aspires to connect the constructive elements, enhancing the understanding of this socio-technical system (Scholz-Reiter 2009).

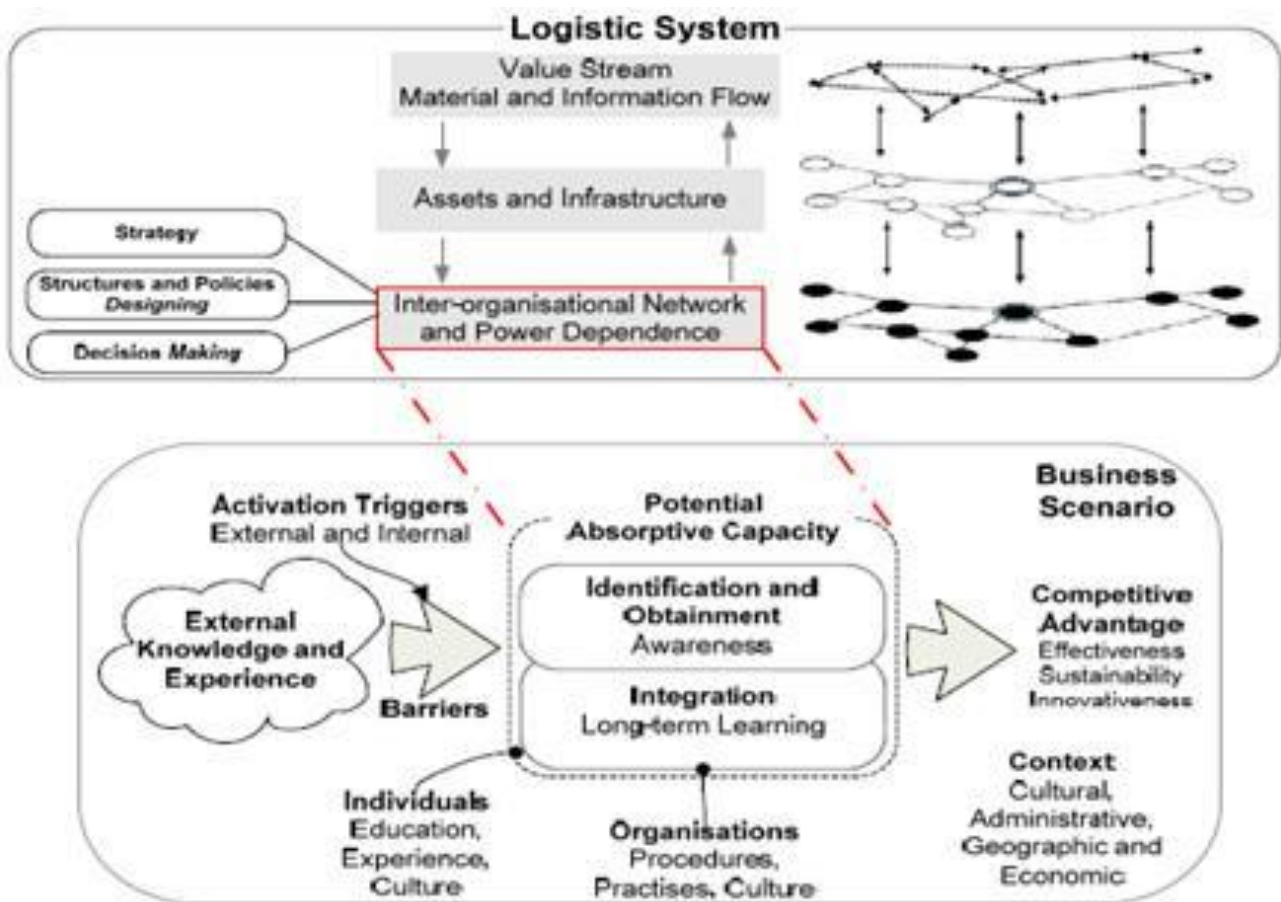


Fig. 1. Descriptive model (Source: Scholz-Reiter 2009)

Lithuania has been isolated from the world for 50 years. Only in the last decade, the beginning of Lithuanian businessmen were free to begin planning their production and trade and the choice of business partners. Commercial communications are to ensure the need for good delivery networks, since the conclusion of the transaction, taking particular account of transportation options, delivery time, price of transport. This is often determined

by its final decision on the necessary raw materials or products to purchase, world practice in some cases, common commercial transaction does not occur simply because of the lack of adequate infrastructure, long delivery times, cumbersome customs procedures, or very high transportation costs and production costs. Comprehensive travelators infrastructure development must be carried out

to the national level, despite the fact that often many vehicles of operators in the private sector.

It was found that the intensification of international trade and develop as certain modes of transport properties of activated international cargo shipments. Therefore it is necessary to focus on the factors that influence the general cargo transport, as a transport system efficiency, it is in the general cost, time, speed, security, service quality, vehicle technical factors as well as factors related to the characteristics of the load, service quality, service availability, range of services and flexibility. The analysis of Lithuanian and foreign scientists, is faced with the fact that most of them focused freight service costs and prices, as the main and the most important factors, transport of goods. It was found that more attention should be paid to the three fundamental factor groups associated with the load characteristics are cargo flows, the sender claims and customer service.

Innovations, new transport technology, transport chain, logistics centers and transport terminals, as a theoretical study by choosing the United States, Great Britain, Russia, Scandinavia and other countries, and scientists examined the macro-environment of political, economic, social, technological and ecological perspective. Theoretic study of transport problems, Coyle, Bardi, Cavinato, Murphy, Wood gave a huge boost for further research work in this field of science.

Lithuania is a significant part of transport professionals and scientists has published work on issues related to logistics centers and transport terminals as the research object. Some of them (Šakalys, Paulauskas, Palšaitis, Baublys), it examines the political perspective, others - Technology (Bazaras, Vasiliauskas). Žvaliauskas for the overall development of transit. Roll-analysis of M. Litvinenko was investigating transit road haulage. The development of transport infrastructure in the economic context, examines the Griškevičienė, Lazauskas, Palšaitis support of theoretical and practical cross-border traffic in the formation of assumptions, while highlighting the Lithuanian transport infrastructure harmonization with the overall trans-European network of opportunities ahead, predicting these processes of economic and social benefit equals. Investment evaluation and modeling the theoretical aspects dealt Ginevičius, Rutkauskas, their work analyzed Investor gravel road paving efficiency of Lithuanian conditions. It should be noted that the Lithuanian scientists in their work by analyzing the state's economic relations, attach great importance to the export of services by means of logistic centers and transport terminals, cargo owners who of prices and service quality ad-

vantage over competitors, carrying goods through the territory of that country.

A long-term strategy of the Lithuanian transport system is isolated to this single most important Lithuanian transport policy:

- Transport infrastructure development.
- Intermodal transport development.
- Information technology and transport systems development.
- Transport development and the environment.
- Improvement of road traffic safety in transport.
- Transport infrastructure facilities, freight and passenger protection.
- Strengthening administrative capacity.

Increasing Lithuania as a transit and logistical services, providing the country's competitiveness must be to create a modern transport infrastructure network that meets the EU's mobility needs and create favorable conditions for the country's economy and social cohesion. To implement this priority must be the development of multi-modal transport infrastructure, promote transport terminals and logistics centers.

### **Integrating Combined Freight Carriage into the International Logistics System**

In order to develop an integrated logistics and the combined freight transport subsystem, the shipper and the carrier, and especially combined transport operators to develop and implement business strategies in a complex joining the managerial, economic, technological and human resources.

In information technology and the development of the transport infrastructure of these processes has not only theoretical but also practical reality. As well as intermodal and combined transport subsystem ensures the emergence of efficient transport of goods, with flexible schedules and services offered by the system, which is able to serve a larger geographical area. Economic Cooperation and Development (OECD) investigated trends in freight transport, say that "adequate multimodal freight transport, the assessment and application of systems analysis can provide a basis for their long-term economy and efficiency." Based on these processes, multimodal and composite load carts associated with the need of theoretical analysis of combined freight transport and logistics integrated development of the assumptions (a) defining the location of the compound transport logistics system, and (b) an examination of the factors that determines the effects of the freight transport logistics system.

*Compound freight place at international transport.*

In the coursework work stressed that most of the theorist to distinguish two fundamental functions of logistics - transportation and warehousing of goods. Hypothetical complex logistics between the main logistics functions (customer service, goods transportation, inventory management, and communication and information security), transport of goods released second only to customer service. Such an interpretation of the main logistics functions is not accidental. It is based on the fact that all logistics functions, as well as the goods transport must contribute to the general objective of logistics. Physical transport of goods, carry out a transport service, which occupies an important place in logistics, ensuring efficient movement of goods between the producer and the consumer, thus guaranteeing the value of time and place development.

Companies can choose to carry their wares own transport or hire a third-party logistics company that organized and will be responsible for the delivery of goods to the consumer. If a company focuses on its own fleet Acquisition, the only option is to purchase motor vehicles. Own vehicles are justified in markets where transport route does not exceed 300-500 mile range, but it has limited ability to transport goods on international routes. Therefore there is a need for Interaction with other modes of transport such as rail and sea transport.

State policy in respect of different modes of transport. This is partly associated with a different form of ownership (public, private), the market liberalizing legislation, investment, international regulation and so on (Table 1).

**Table 1.** Benefit expected by participants of combined transport (compiled by authors)

Interested side	Expected benefits
Water transport company	Creation of new products and new markets occupation (income and jobs).
Existing shippers	Lower transportation costs, higher reliability and greater security.
Potential shippers	Opening of new markets, more transportation options, and lower transportation costs.
Railways	The potential growth market segments where can successfully compete with road transport.
Road transport	Increased cost-effectiveness, driver flexibility.
Forwarders	Bigger spector of transport alternatives and opportunities, smaller consumption.
MTO	Increased cost more transportation alternatives, lower costs (income and jobs).
Public institutions	Additional transportation options, traffic safety, more efficient environment.

It may be that the public policy of different modes of transportation (primarily infrastructure) will evolve differently, and this difficulty of transport coordination, would prevent achieving high service delivery level. Development can only occur in certain social groups benefit from political populism, start a common legal regulations and so on. This, of course, should hurtful transport development and market liberalization. Also, do not forget the individual or business entity who, in order to maintain a personal profit, prevents the emergence of new, innovative transportation methods.

### **Competence and quality of Logistics performance**

A country's ability to trade globally depends on its traders' access to global freight and logistics networks.

And the efficiency of a country's supply chain (in cost, time, and reliability) depends on specific features of its domestic economy (logistics performance). Better overall logistics performance and trade facilitation are strongly associated with trade expansion, export diversification, attractiveness to foreign direct investment, and economic growth (World Bank 2012). That is why, LPI survey consists of two major parts offering two different prospective: international and domestic.

A international assessment of logistics performance compares the trade logistics profiles of 155 countries and rates them on a scale of 1 (worst) to 5 (best) and includes six following components (World Bank 2012):

- The efficiency of the clearance process by border control agencies, including customs;

- The quality of trade- and transport-related infrastructure;
- The ease of arranging competitively priced shipments;
- The competence and quality of logistics services;
- The ability to track and trace consignments;
- The frequency with which shipments reach the consignee within the scheduled or expected delivery time.

On the other hand, domestic LPI also includes a set of domestic performance indicators for 143 countries and defines logistics constraints within countries. They analyze the major determinants of overall logistics performance, focusing on country performance in four major determinants: infrastructure, services, border procedures and time, and supply chain reliability.

### Logistics Performance Index and its indicators

The Logistics Performance Index (LPI) and its indicators have been provided from data of information gathered in a worldwide survey of the companies responsible for moving goods and facilitating trade around the world—the multinational freight forwarders

and the main express carriers. It relies on the knowledge of professionals in such areas of expertise as shipping routes and gateways, the firms' decisions about the location of production, choice of suppliers and selection of target markets.

The LPI and its indicators' scores examined significant differences in logistics performances by countries. These differences reflect the disparities between developed and emerging economies (such as Singapore, which rank is highest) and other developing countries, especially the least-developed countries.

The logistics performance is evaluated by comparison similar development level countries. The leading or lagging countries are defined taking into account respectively positive or negative between real rank of LPI in index table and potential one accordingly to those countries GDP per capita. In 2012 gaps between high- and low-income countries in logistics performance are wide enough.

The countries with the worst performance in 2012 were least developed countries (Burundi is lowest) that were also landlocked countries, small-island states, or post-conflict countries (Table 2).

**Table 2.** LPI ranking and scores of year 2012 (Source: The International Bank for Reconstruction and Development, 2012)

Economy	Rank	LPI
Singapore	1	4,13
Finland	3	4,05
Germany	4	4,03
Netherlands	5	4,02
Lithuania	58	2,95
Estonia	65	2,86
Greece	69	2,83
Latvia	75	2,80
Belarus	91	2,61
Russia	95	2,58
Burundi	155	1,61

Overall allocation of ranks shows that most of leading in logistics performance countries (60 %) are ES countries as well as highest scores in 2012 have Finland (3 place), Germany (4 place) and Netherlands (5 place). Lithuania takes 58 place in this chart. Similarly to Lithuania, Estonia (65 place), Greece (69 place) and Latvia (75 place) have lowest results among ES countries (Table 2).

One possible explanation for this variation may be that Lithuanian government does not have clear long-term strategy of logistics development. Long-term (up to 2025 year) of the Lithuanian transport system development strategy (approved only in 2005 June 23 Lithuanian Government Resolution No. 692) was prepared in case of need to update the year 2002 prepared by the Lithuanian

transport and transit development strategy, which is an integral part of the Lithuanian economics development up to 2015 long-term strategy.

What is more, evaluating LPI index of a country, it is always taking into account LPI indexes of countries arranged nearby, so Lithuanian LPI index is also determined by LPI indexes of neighboring countries (Russia takes 95 place and Belarus - 91 place in rating).

### Connection of logistics business and sustainable development

Hajek, Obršalova (2009) argues that sustainable development of the European Union has become the main engine of growth. While analysing the sustainable development, it is necessary to take into account not only the global or national level, but also necessarily the regional or localized level, without forgetting the cultural differences.

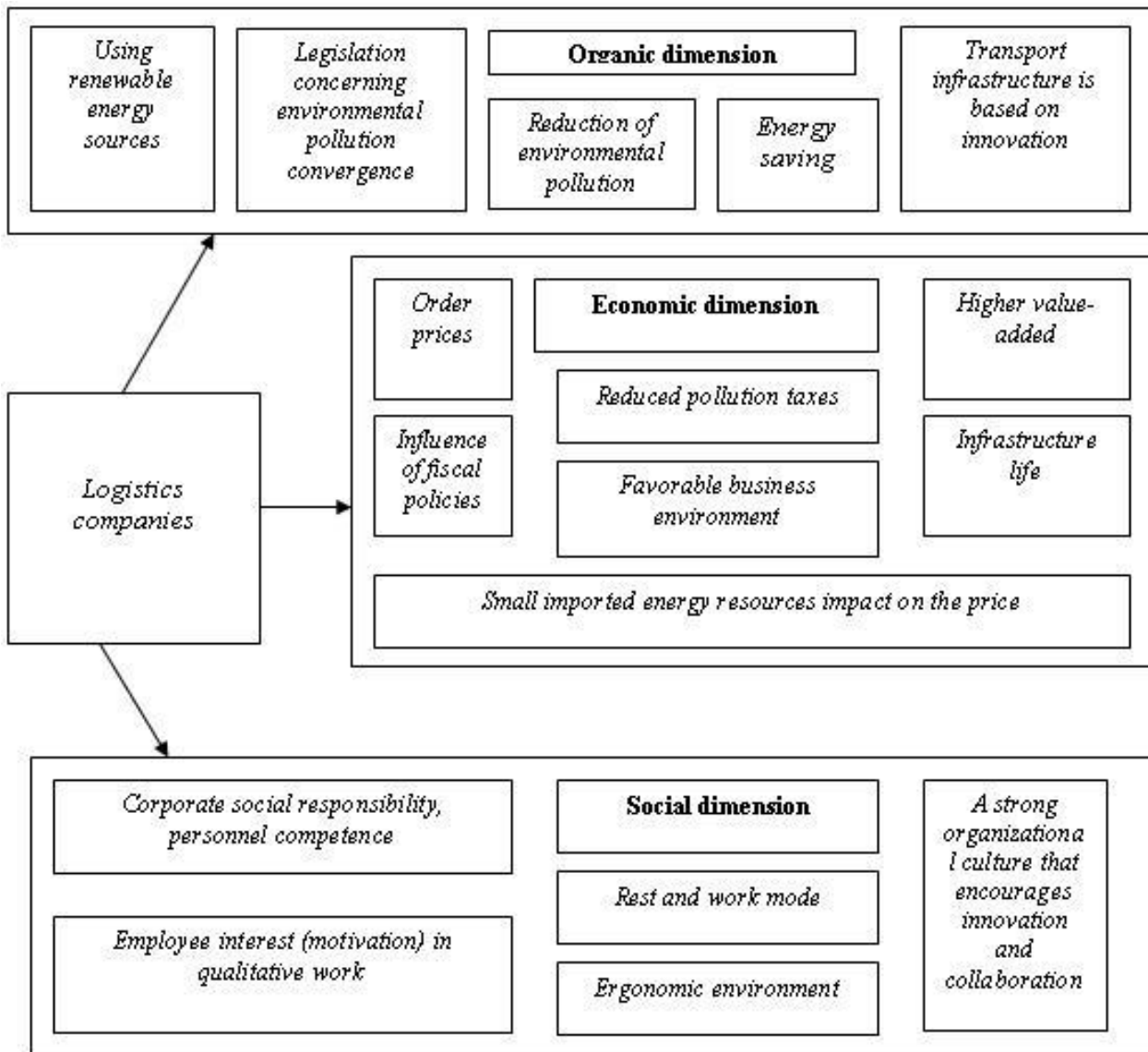


Fig. 2. Logistic enterprises and sustainable development model (compiled by author)

In order to measure sustainable development, it is usual to select a number of indicators for each of the three (or more) dimensions – economic, environmental, social, etc. There are over 500 models of sustainable development indicators that were developed to satisfy the needs of governments and inter-governmental organizations, of

which about 70 are global, over 100 - national, more than 70 – regional and about 300 - local (Parris 2003).

With thoughts of special purpose of sustainable development, we realize that sustainable development must inevitably be practised at a local level and in specific organizations. Taking the essentiality of sustainable de-

velopment and the fact that, unfortunately, Lithuania logistics index (LPI) among the European Union countries was evaluated as the least attractive, we decided that sustainable development model of logistics company, which clearly shows the three sustainability levels and related activities of the company with certain variables, can benefit the logistics companies' managers and employees (Fig. 2).

While assessing the overall index level of logistics in the context of countries and the contribution of one company, we can apply Sypion-Ditkowska (2006) idea that organizations should be investigated complexly. She recommends evaluating organizations in three levels: ecological level, economic level and social level. According to these three levels of evaluation we can arrange our priorities, values and according to them, through innovation, logistics companies can improve not only as a unit, but also contribute to the rise of the whole index of country it operates in. The present model shows that in the ecological level, both countries and logistics companies should seek more efficient use of renewable energy sources (Fig. 2). Also, while developing international cooperation in the field of logistics, countries should immediately seek to unify legislation concerning environmental pollution and environment protection.

Logistic company's sustainable development model on economic basis reflects opportunities when the company can establish cost-effective routes, attractive prices of bookings through the use of renewable energy resources. The economic level leads to better overall business environment, lower taxes and better fiscal policy. The development of logistics systems on ecological basis increases added value and lowers the dependence of imported resources (gas, etc).

Equally important for logistics Company in the sustainable development model is the social dimension. The social level is the obvious link with the environmental and economic levels. This promotes corporate social responsibility and competence of employees, regulates workplace safety, ensures work and rest regulations, resulting in greater motivation and interest in the organization, while at the same time, the prosperity. Organization's contribution to the overall system of logistics in order to raise the level of the index should be the greatest. The organization itself should be socially responsible and continuously develop staff competence in certain areas.

Criteria, provided in the model, in different levels are of different efficiency. They influence the development of logistics enterprises and have different effects;

their effectiveness and efficiency under certain circumstances are also different. The model describes only the circumstances under which the logistic company could increase its competitiveness through a sustainable development model at three different levels. Separate criteria performance (efficiency) can be described only by examining certain company and the area in which the organization operates.

## Conclusions

1. Transport and logistics sector is very important for the international economy. Societies becoming increasingly dependent on their transport systems to support a wide range of activities, from commuting to supply the energy needs of the vector parts of factory. The successful development of the sector to ensure a better quality of life and lower product costs.
2. The World Bank provided logistical level index (LPI) and estimated rating directly reflects the real situation doing logistics operations. Lithuanian's poor evaluations, demonstrate that the country has no clear long-term strategy for the development of transport and logistics strategies and insufficient handled countries security issue.
3. The presented model confirmed the sustainable development concept and can be applied in logistic organizations and in other organizations. Most importantly, these criteria are influenced by and can influence their development, because take into account the economic, ecological and social dimension, which clearly sets out the relevant criteria that create coherence in a particular organization.

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## INOVACIJOS PLĖTOJANT TARPTAUTINĘ LOGISTIKĄ

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Santrauka

Straipsnyje analizuojama tarptautinių santykių plėtros, inovacijų, produktų ir paslaugų mainų, kaip labai svarbių logistikos sprendimų, verslo plėtros svarba. Naudojant naujausius mokslinius tyrimus ir logistikos verslo veiklos tvaraus vystymosi idėją, siekiama skatinti jų plėtrą (LPI). Autoriai pateikia tvaraus logistikos vystymosi modelį, kuris gali būti sėkmingai naudojamas ir pritaikytas organizacijos valdyme. Šiame modelyje yra trys lygiai: ekologinis, ekonominis ir so-cialinis.

**Reikšminiai žodžiai:** inovacijos, logistika, logistikos kompanijos, logistikos kompanijų darnus vystimasis, logistikos lygio indeksas (LPI), šiuolaikinės technologijos, tarptautinis verslas.