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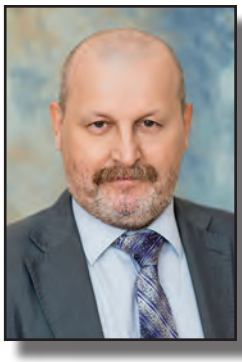
Sustainability of Resource Supply Systems



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ABSTRACT

An urgent problem in supply chain management is ensuring their sustainability. The solution to this problem is complicated by vague delimitation of several terms that are adequate to the concept of «sustainability», such as «reliability», «security», «survivability», «resilience», as well as by lack of a systematic approach to determining sustainability of resource supply systems that is composed, according to the author, of sustainability of the basic components of logistics management. The objectives of the study are to clarify the nature of sustainability, to develop a classification and substantiation of the sequence for determining sustainability of resource supply systems, which will increase their competitiveness.

The methodological base of the study includes theoretical provisions of management, logistics, supply chain management, value stream management and logistics management.

The chosen research methods comprise logical-structural methods: terminological analysis, groupings, typology and classification, involving selection and use of a body of classifying features and components, which, to a necessary and sufficient degree, reflect the essence of the term «sustainability» and its accompanying terms.

The study has resulted in author's definitions of the concepts of «sustainability», «resilience», «flexibility», «survivability», «static character», «dynamism», «reliability», «maneuverability» and «security» of resource supply systems and in recommendations for determining sustainability of systems of this type, consisting of stability of the basic components of logistics management.

The results of the study allow us to create theoretical and methodological prerequisites for determining reliability of technological, trade and logistics links and, using them as a basis, of the channels, chains, fronts and echelons of the resource supply system, as well as to develop recommendations for changing the content of SCOR and DCOR models that form the basis of supply chain management.

Keywords: resource supply system, sustainability, sustainability management, value, survivability, resilience, flexibility.

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The problem of sustainability of objects of management, which include the resource supply system («totality of suppliers and intermediaries (links) that form supply channels, chains, fronts and echelons and carry out processes of consolidation and disaggregation of resource flows...» [1, p. 98]) is constantly in the center of attention of experts [2].

Yu Xia and Thomas Li-Ping Tang note that «the methods of managing stability of supply systems help to reduce the lead time for customer orders, form flexible supply chains of resources, and reduce the cost of interaction with suppliers. Sustainable supply systems can flexibly respond to market needs and operate with smaller stocks» [3, p. 495].

During the economic crisis (2007–2008 – *author's note*), enterprises involved in sustainable supply chains showed better results compared to those enterprises that made part of traditional supply chains [4, p. 534].

Supply chain sustainability management has received the status of a separate discipline, the specifics of which comprise «management of material, information and capital flows, as well as interaction of enterprises in the form of supply chains (systems – *author's note*), using three aspects of sustainable development as goals, which are economic, environmental and social aspects, taking into account the interests of the client and the requirements of the owners» [5, p. 1700].

The relevance of the problem of sustainability of resource supply systems is due to the following reasons:

• in the context of globalization and growing competition, management of external and internal interested counterparties, from suppliers of raw materials to end consumers of goods (products and services), has become the prerogative of supply chain management, which is currently positioned by researchers as a method of managing sustainability of enterprises [6];

• transformation of supply chains into value creation chains for end consumers of products and services [7, p. 2203], which led to transformation of the problem of their integration into the problem of sustainable development of these chains [8, p. 18];

• high requirements for reliability and other indicators of effectiveness of links in the supply systems of resources, forced to adapt to the changing values of their end users;

• increased complexity of production and organization structures of logistics systems of this type (i.e. [9, p. 409; 10, p. 5018]);

• presence of cross-functional barriers both inside and outside the links of resource supply systems that impede creation and delivery of values to their final consumers;

• significant risks of activity of systems of this type, due to probability of a negative impact of the results of opportunistic behavior of one or more of their links on the results of the system as of a whole, etc.

The problem of ensuring sustainability of the resource supply system involves solving the interrelated problems of sustainability management of:

1) its links;

2) main types of this system;

3) relationship between its links when exposed to factors of the external and/or internal environment.

The formulation of the above problem is also complex and needs to be structured and formalized. As a first approximation, using such classification features as:

• the number of supply chains of resources (single one, several);

• the number of links in the supply chain of resources (single one, several),

we can distinguish four options and establish the relationship between them (Pic. 1).

As follows from the content of Pic. 1, sustainability of resource supply system (starting from its simplest form, the channel) can be determined through stability of:

• resource supply chain, which is fundamentally important from the point of view of the interests of a particular consumer of resources;

• front of resource supply, which is fundamentally important from the point of view of the interests of two or more consumers of resources simultaneously [1, p. 101].

The *objective* of the research is to clarify and supplement the theoretical and methodological aspects of the problem of sustainability of resource supply systems as of a component of their reliability.

As research *methods*, logical-structural methods are selected: analysis, grouping and classification.

		Number of links in resource supply chain	
		One	Several
Number of resource supply chains	One	Sustainability of the link of resource supply *(option 1.1)*	Sustainability of resource supply chain *(option 1.2)*
	Several	Sustainability of the front of resource supply *(option 2.1)*	Sustainability of the echelon of resource supply *(option 2.2)*

Pic. 1. Options of interpretation of sustainability of resource supply system (developed by the author).

Sources review

S. I. Ozhegov and N. Yu. Shvedova define the concept of «sustainable» as «1. Standing, holding steady, not hesitating, not falling; 2. Not subject to fluctuations, constant, stable, solid» [11, p. 841].

T. F. Efremova notes that «sustainable means able to maintain this position, despite the action of various forces» [12].

Sustainability can mean «ability... of the system to restore the initial (or close to it) state (mode) after any of its violations, manifested in the deviation of the values of the parameters of the mode from the original ones» [13, p. 571].

Ana Paula Barbosa-Póvoa emphasizes that a sustainable supply chain can be described as a complex network system, including various organizations that manage products from suppliers to customers and related redistributions of these products, taking into account social, environmental and economic consequences [14, p. 2].

A. G. Nekrasov defines the concept of supply chain sustainability as follows: «the state of the supply chain, which is in the planned mode of operation, is stable if, for a fixed set of acceptable control actions, limited and relatively small in magnitude disturbing effects lead to limited and relatively small changes in the output variables» [15, p. 51].

The authors of the paper[1] define sustainability of supply chain as «the ability of supply chain to react and adapt to changes in the external environment so that its assessment indicators are in strictly defined acceptable intervals, or return to their original parameters during a given transition period».

I. V. Yakhneeva points out that: «the most widespread in the foreign scientific community is the provision that to be sustainable means to react and return to the same or better state. Accordingly, the ability to recover is called elasticity of the system» [16].

Besides the concept of «sustainability», the following terms apply in relation to systems (chains) of supply of resources in written sources:

• *security of resource supply chain*. For example, the concept of «security management» was introduced in the source[2], which is interpreted as «a systematic and coordinated activity by which the organization participating in the supply chain manages its risks, potential threats and impacts associated with them»;

• *reliability of the resource supply chain*. In particular, this term is understood as «the property of the supply chain to maintain, within established limits, the values of all its characteristics and elements (reliability, durability, recoverability, and preservation) that characterize the ability of the chain to perform all its functions in accordance with the terms of contracts between its participants» [17, p. 37];

[1] Definition of the concept «sustainability of supply chains». [Electronic resource]: https://studme.org/68522/logistika/opredelenie_ponyatiya_ustoychivost_tsepey_postavok. Last accessed 05.09.2019.

[2] GOST R [Russian state standard] 53662-2009 (ISO 28001:2006). The best methods to ensure supply chain security. Estimates and plans. [Electronic resource]: http://files.stroyinf.ru/Data1/59/59142/. Last accessed 05.09.2019.

		Operation mode	
		Nominal	Marginal
Indicators of the product's purpose	Relatively stable	Persistence (Storability)	Reliability
	Require adjustment	Durability	Repairability (Maintainability)

Pic. 2. Classification of components (indicators) of the product's reliability ([21], further developed by the author).

• *resilience of the resource supply chain* or, among other things, «the ability... to withstand threats and recover quickly if these threats become a reality and cause significant damage»[3];

• *resource supply chain flexibility*. For example, K. N. Popadyuk believes that «chain flexibility is the ability to timely adapt the supply chain to changing customer needs, for example, by changing the share of sales of a product in a portfolio depending on demand or introducing new product modifications to the market» [18];

• *maneuverability of the resource supply chain*. In the presentation of V. I. Sergeev (within the framework of SCOR-model[4]): «maneuverability (or dynamism) means the ability to respond to the influence of external factors, the ability to make changes» [19, p. 84];

• *adaptability of the resource supply chain*. In the same work [19, p. 81] adaptability (AG indicator), is a component of maneuverability (dynamism) of the supply chain and is assessed as «*the maximum attainable steady percentage increase in the number of deliveries...*» [19, p. 86]. By the way, flexibility refers to the same AG indicator, interpreted as «the number of days required to achieve an unplanned sustainable (see definitions of this concept, presented above – *author's note*) increase in the delivered quantity of products» [19, p. 85].

From the content of sources it follows that:

• there is a need for research for subsequent integration of all aspects of sustainability of joint ventures into the methodology of designing and planning supply chains for a comprehensive assessment of sustainability of their strategies [20];

• until now, a logically linked set of components (indicators) has not been developed that should have characterized the ability of the resource supply system to achieve its goals while facing negative impact of the external and/or internal environment on it (or reliability of this system);

• creation of the above system involves updating the current approach to managing sustainability and, of course, reliability of the resource supply system, including adjusting the content of SCOR and DCOR models that form the basis of supply chain management.

Thus, the achievement of the objective set in the article is relevant for improving the theory and methodology of logistics, which includes supply chain management as a concept of enterprise management [1, p. 29].

Clarification of the essence of sustainability as a component (indicator) of reliability of the resource supply system

The basic prerequisite for solving this problem is the well-established opinion of experts that the reliability indicator of the finished product is complex, including indicators of reliability, durability, recoverability (maintainability), and storability[5]. Moreover, in [21, p. 46] their classification is proposed (Pic. 2).

The content of Pic. 2 in conjunction with the classification features of the definitions of

[3] Management of the organization resilience. [Electronic resource]: https://studme.org/123707066582/menedzhment/upravlenie_zhiznestoykostyu_organizatsii#701. Last accessed 05.09.2019.

[4] SCM definitions and Glossary of Terms. [Electronic resource]: http://cscmp.org/CSCMP /Educate/SCM_Definitions_and_Glossary_of_Terms/CSCMP/Educate/SCM_Definitions_and_Glossary_of_Terms.aspx?hkey=60879588-f65f-4ab5–8c4b-6878815ef921. Last accessed 05.09.2019.

[5] GOST [Russian state standard] 27.002-89. Reliability in the equipment. Basic concepts. Terms and definitions. [Electronic resource]: http://docs.cntd.ru/document/1200004984. Last accessed 05.09.2019.

		Functioning mode of the controlled object under negative impact	
		Loss and recovery	Loss and change (increase) in the potential (capacity)
Stability of the objectives of the controlled object	Stable	Sustainability (mode: return)	Flexibility (mode: adaptation)
	Subject to adjustment	Resilience (mode: survival)	Survivability (mode: counteraction)

Pic. 3. Classification of components (indicators) of reliability of the control object (developed by the author).

		Disturbances of the external and internal environment on the control object	
		Insignificant	Significant
Changes in internal variables of the control object	Insignificant	Return	Adaptation
	Significant	Counteraction	Survival

Pic. 4. Classification of the functioning modes of the control object ([15], further developed by the author).

the components (indicators) of reliability of the finished product, allows us to develop a classification of components (indicators) of reliability of the controlled object, which include the resource supply system (Pic. 3).

As follows from the content of Pic. 3:

1) such components (indicators) include sustainability, resilience, flexibility and survivability of the resource supply system;

2) it is advisable to establish the functioning mode of the control object considering the classification features presented in Pic. 4, the basis of which is the point of view of A. G. Nekrasov [15, p. 51];

3) if restoration of the potential (capacity) of the resource supply system is carried out quantitatively, then its change (growth) occurs both quantitatively and qualitatively;

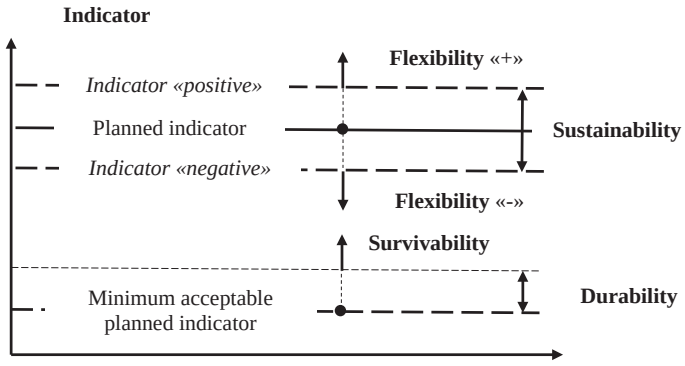
4) classification features that made it possible to identify the components (indicators) of reliability of the controlled object (Pic. 3), in conjunction with the modes of functioning of this object that are adequate for them (Pic. 4), allow us to give them the following definitions:

• *sustainability* of the resource supply system is an indicator characterizing the ability of the system to perform its functions under the conditions of the negative impact of the external and/or internal environment in the mode of return to the initial (or close to it) state while maintaining the previously set goals and ensuring subsequent full or partial restoration of its potential;

• *resilience* of the resource supply system is an indicator characterizing the ability of the system to perform its functions under the negative impact of the external and/or internal environment in the survival mode (eliminating the likelihood of liquidation) when adjusting previously set goals and ensuring subsequent full or partial restoration of its potential;

• *flexibility* of the resource supply system is an indicator characterizing the ability of the system to perform its functions under the conditions of negative impact of the external and/or internal environment in the mode of adaptation to these influences (response to them) while maintaining the goals set before it and ensuring subsequent change (increase) in its potential;

• *survivability* of the resource supply system is an indicator characterizing the ability of the system to perform its functions under the negative impact of the external and/or internal environment in the mode of counteracting these effects when adjusting the previously set goals and ensuring subsequent change (increase) in its potential;



Pic. 5. Graphical interpretation of the concepts «sustainability», «flexibility», «survivability», «durability» (developed by the author).

5) a graphical interpretation of the concepts of «sustainability», «flexibility», «survivability», «durability» is presented in Pic. 5, from which it follows that:

• sustainability is ability of the controlled object to achieve the value of the planned indicator in the range established for it;

• flexibility is ability of the controlled object to achieve adjusted values of the planned indicator outside the range originally set for it;

• durability is ability of the controlled object to prevent the achievement of the minimum acceptable planned indicator set for it;

• survivability is ability of the control to improve the value of the minimum acceptable indicator;

6) components (indicators) presented in Pics. 3 and 5 create the basis for formation of complex components (indicators) of reliability of the resource supply system, such as:

• *static character* of the resource supply system is an indicator characterizing the ability of the system to perform its functions under the negative impact of the external and/or internal environment in the modes of return to the initial or close state and/or adaptation to these influences while maintaining the previously set goals and ensuring subsequent restoration and/or change (increase) in its potential;

• *dynamism* of the resource supply system is an indicator characterizing the ability of the system to perform its functions under the negative impact of the external and/or internal environment in the modes of survival and/or counteraction to these influences when adjusting previously set goals and then restoring and/or changing (increasing) its potential;

7) the basic and complex components described above allow us to give the following definition of *reliability* of the resource supply system as of an indicator characterizing the ability of the system to perform its functions: to design, create and deliver value to its end consumers under the negative impact of the external and/or internal environment on it, basing on management by objectives and using growing potential of both the system itself and its links.

Analysis of the above logically linked set of components (indicators) characterizing reliability of the resource supply system allows us to draw the following conclusions:

• ability of the resource supply system to timely and qualitatively adjust objectives, or rather, to manage objectives and potential gains under negative impact on the given system of the external and/or internal environment, can be characterized by *maneuverability* of the resource supply system;

• *security* of the resource supply system is determined by the difference of potentials: available at a given time and necessary in order to maintain the minimum acceptable level of stability under the negative impact on the given system of external and/or internal environment;

• *sustainability and durability* of the resource supply system are ensured using the traditional management systems: goals, objectives, principles, functions, methods, and approaches. Under the negative impact of the external and/or internal environment, the managerial staff of the resource supply system believes that they are temporary in nature and therefore develops and applies defensive strategies as a response, for example, *a strategy to cut off excess*;

Table 1

Options of ratios of the indicators of sustainability of the resource supply channel (developed by the author)

Previous channel link	Subsequent channel link			
	Flexibility (F)	Sustainability (Su)	Survivability (Sr)	Durability (D)
Flexibility (F)	F-F	F-Su	F-Sr	F-D
Sustainability (Su)	Su-F	Su-Su	Su-Sr	Su-D
Survivability (Sr)	Sr-F	Sr-Su	Sr-Sr	Sr-D
Durability (D)	D-F	D-Su	D-Sr	D-D

		Object whose sustainability is controlled	
		Natural (material)	Human resources
Priorities of sustainability management	Consolidation and maintaining the results achieved	Economic sustainability	Social sustainability
	Creation of prerequisites for the long-term development	Environmental sustainability	Innovative sustainability

Pic. 6. Classification of sustainability of the resource supply system (developed by the author).

• *flexibility and survivability*, in turn, are supported in implementation of offensive strategies aimed, inter alia, at developing management systems, for example, by diversifying the activities of resource supply systems;

• *since the resource supply system* is a complex controlled object, its links can focus on priority components of reliability for them. For example, one link that gravitates toward initial suppliers is durability, and the other, located in the supply chain closer to the end consumer, is flexibility. Variants of the ratios of indicators of sustainability of a system of this type at the example of the resource supply channel are presented in Table 1.

This aspect involves creation of a methodology that provides an integrated approach to assessing reliability of both individual links and the resource supply system as of a whole.

The information presented in Pics. 3 and 5, creates the basis for highlighting the main types of sustainability of resource supply systems. The solution to this problem in relation to a specific enterprise (link) is described in [1, p. 345]. As a result of the use of such classification features as:

• object whose sustainability is controlled (natural (material) resources, human resources);

• sustainability management priorities (consolidating and maintaining the results achieved, creating the prerequisites for long-term development),

four types of sustainability of the resource supply system can be substantiated which are *economic, social, innovative,* and *environmental* sustainability (Pic. 6).

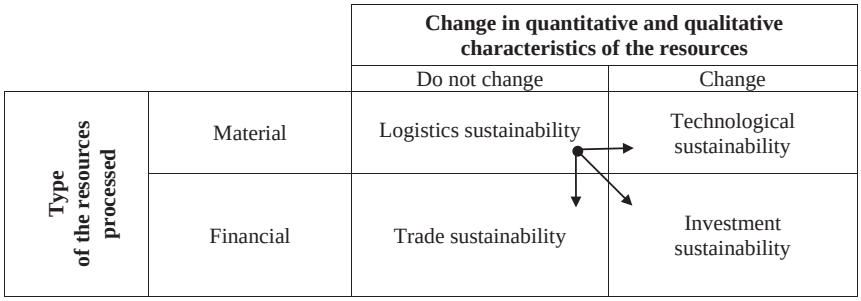
This aspect of the study:

• clarifies the point of view of researchers studying sustainability of supply chains with an emphasis on three rather than four groups of goals: particularly on social, environmental and economic goals [5, p. 1700; 22, p. 2];

• supposes assessing sustainability of the resource supply system, considering not only their types (Pic. 1), but also the business processes they perform. For example, social sustainability is assessed from the perspective of such business processes of logistics as personnel management, management of relationship with suppliers and consumers, and innovative sustainability is assessed from the point of view of management of goods (products and services), technological and logistics management (order fulfillment and return management) [1, p. 51].

The concept and structure of the logistics sustainability of the supply chain of resources

Craig R. Carter and Dale S. Rogers define supply chain sustainability as «strategic,



Pic. 7. Classification of economic sustainability of the resource supply system (developed by the author).

transparent integration and achievement of social, environmental and economic goals of the company in the system coordination of key inter-organizational business processes to improve long-term economic performance of the activity of this company and its supply chains» [23, p. 368].

If we adhere to orientation towards achieving sustainability of resource supply systems through implementation of business processes with their subsequent division into functions, we can distinguish the main components of economic sustainability of these systems.

To solve this problem, it is advisable to use the following classification features:

• type of the processed resources (material, financial (monetary));

• change in quantitative parameters and qualitative characteristics of resources (do not change, change).

As a result, four types of economic sustainability of resource supply systems can be distinguished: logistics, trade, technological and investment type of economic sustainability (Pic. 7).

It should be noted that:

• logistics sustainability (from the position of logistics management, but not from the position of logistics) is more or less related to the trade, technological and investment sustainability of the resource supply system;

• logistics sustainability refers to consolidation and disaggregation of batches of resources while maintaining quantitative parameters and qualitative characteristics of a resource unit;

• technological sustainability of the resource supply system is evaluated in case of changes in the geometric dimensions, mass, composition and configuration of a resource unit;

• trade sustainability of the resource supply system is associated with sustainability of relations of its links regarding acquisition and/or transfer of ownership of resources;

• investment sustainability is assessed not only when the resource supply system is maintained in conditions of commodity-money relations, but also when they change, leading to a violation of sustainability of this system.

The structure of the logistics sustainability of the resource supply system can be clarified if we use the source data [1, p. 29] and classification features:

• the state of a value[6] of a supplier/consumer (ready-to-use, being created);

• the state of resources in time and space (dynamics (change), static nature (conservation)), presented in Pic. 8.

As follows from Pic. 8:

• the main component of logistics sustainability is sustainability of the flow of resources or of the moving mass of these resources, and if this mass stops moving, then the logistics sustainability should be assessed from the position of stock sustainability. Recall that the flow of resources, like the stock of resources, is the object of logistics management as a concept of enterprise management [1, p. 90];

• the resource flow, in turn, can move due to implementation of logistics processes, the typology of which is presented in [1, p. 131]. These processes are implemented as part of logistics management which is «a type of activity of enterprises that is associated with concentration, distribution and movement of flows of material, information, financial and human resources using the optimal paths for

[6] The term originally used by the author is of most general character and is consistently translated further-on as «value» to avoid ambiguity, while in certain cases below it can be interpreted as tangible values, material assets, etc. – *ed. note.*

		State of a value of a supplier/consumer	
		Ready-to-use	Being created
State of resources in time and space	Dynamics (change)	Resource flow sustainability	Process sustainability
	Statistic nature (preservation)	Reserve (stock) sustainability	System sustainability

Pic. 8. Classification of components of the logistics sustainability of the resource supply system (developed by the author).

		Value characteristics	
		Maintain	Change
Perception of value by the consumer	Positive	Sustainability	Increase in sustainability
	Negative	Non-sustainability	Decrease in sustainability

Pic. 9. Classification of options of sustainability of perception of value by its consumer (developed by the author).

them to consumers located within certain territories, in accordance with the objective, which enterprises achieve together as links in the resource supply chain» [1, p. 69]. Therefore, when managing logistics sustainability, sustainability of logistics processes should be considered;

• logistics processes are performed by links of a system (chain) of supply of resources, which is the object controlled by such a component of logistics as supply chain management [1, p. 29]. It is logical to assume that within the framework of logistics sustainability, it is necessary to consider sustainability of systems that perform logistics processes. In contrast to resource supply systems, systems of this type represent logistics links (subsystems) of resource supply systems;

• the links that absorb the resource flow are their end users. As theory and practices show, effective management of relations with these consumers is based on «creation, communication, delivery and exchange of offers that are valuable to consumers, customers, partners and society as a whole»[7];

• values of end-users of resources in space and in time form flows. The value flow means «totality of the unique characteristics of objects and processes united by certain signs that are sequentially felt by the consumer in space and time depending on his material, mental or spiritual state» [1, p. 56]. The value flow of the end user of resources is the object controlled by such a component of logistics as value management [1, p. 29];

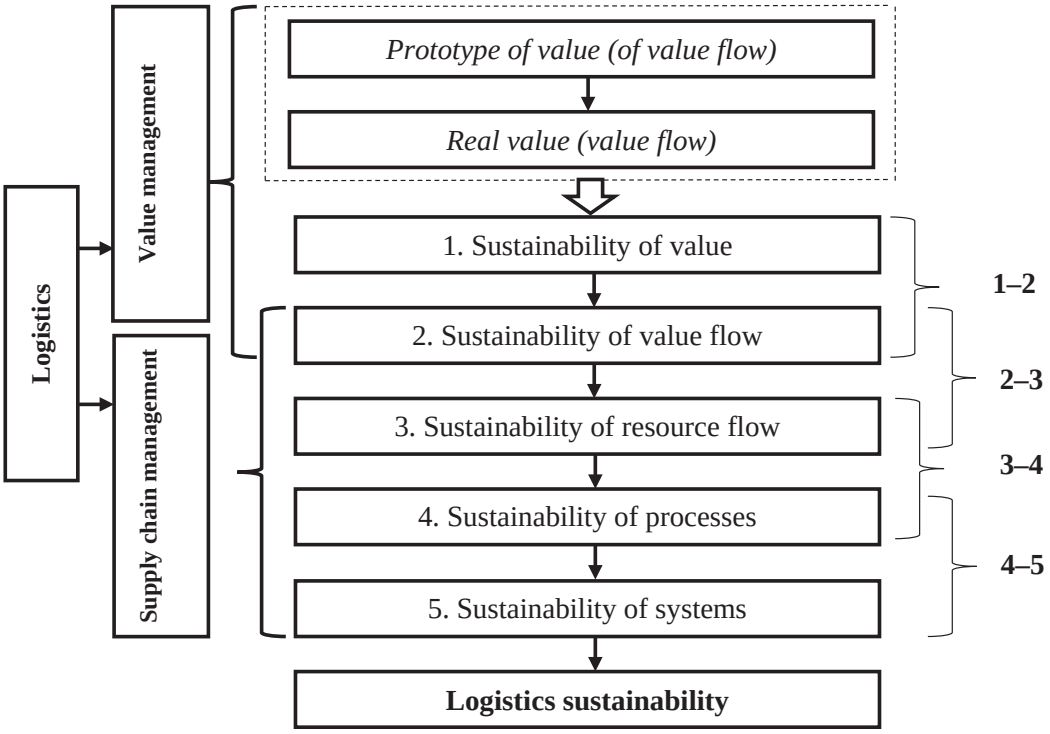
• the main indicator that predetermines sustainability of the resource supply system is the indicator of value sustainability (of value flow sustainability), which, in turn, depends on sustainability of perception of a given value (as well as of value flows) by its end user. It is this indicator that allows to delimit in detail reliability indicators of the resource supply system, presented in Pics. 3 and 5.

Let us turn to Pic. 9, which highlights not only options for sustainability of perception of value by its end user, but also the sequence of its changes in accordance with stages of the life cycle of goods (of product and/or service), respectively: increasing sustainability → sustainability → decreasing sustainability → non-sustainability → increasing sustainability (or rejection of the value created and delivered by the resource supply system).

As follows from the content of Pic. 9:

• static nature (sustainability and flexibility) of the resource supply system is evaluated and corrected when there is no non-sustainability of perception of value by its consumer (in a negative scenario, its decrease is observed);

[7] About AMA. [Electronic resource]: https://www.ama.org/AboutAMA/Pages/Definition-of-Marketing.aspx. Last accessed 05.09.2019.



Pic. 10. Sequence of determination of logistics sustainability of the resource supply system (developed by the author).

• dynamism (durability and survivability) of the resource supply system is relevant in case of non-sustainability of perception of value by its consumer, which the marketing services of the final links of the resource supply system should be able to evaluate and control.

The sequence of determining sustainability of the supply chain system

The above material, inter alia:

• confirms the author's point of view that logistics, as a concept of enterprise management, includes two basic components: supply chain management and value management [1, p. 29] (the left side of Pic. 10);

• allows to develop a sequence for determining the logistics sustainability of the resource supply system (the right part of Pic. 10).

As follows from this picture:

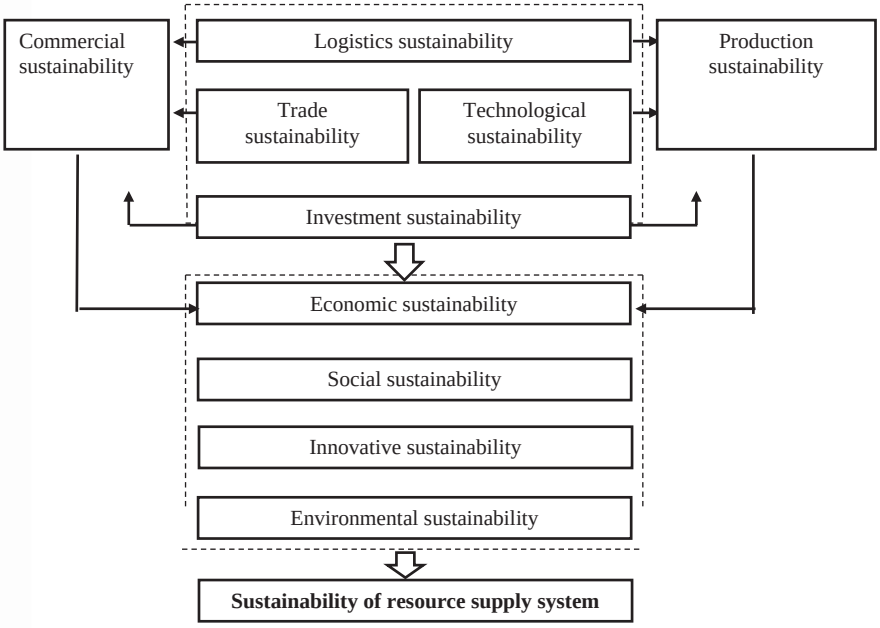
• logistics sustainability is formed on the basis of transition from determining sustainability of one controlled object to another: from determining value sustainability to determining sustainability of the value flow (relationship 1–2); from determining sustainability of the value flow to determining sustainability of the resource (stock) flow (relationship 2–3), etc. The methodology for managing the logistics sustainability of the resource supply system is subject to a separate study;

• when managing the value flow, not only sustainability of the value flow should be taken into account, but also sustainability of the individual value of the end consumer of resources should be considered;

• sustainability of the value flow should be in the field of view of both management of value flows and supply chain management;

• logistics sustainability only partially characterizes sustainability of the resource supply chain and is one of the indicators of effectiveness of logistics management;

• sustainability of systems within the framework of logistics sustainability of resource supply systems provides, particularly, the



Pic. 11. Sequence of determining sustainability of resource supply system (developed by the author).

logistics sustainability of its main types: channels, chains, fronts, and echelons.

Sustainability of the resource supply system as of a whole is determined in accordance with the sequence presented in Pic. 11.

As follows from this picture:

• logistics sustainability refers to the logistics links of the resource supply system, as well as to their units performing logistics processes;

• logistics sustainability together with trade and investment sustainability forms commercial sustainability of the links of the resource supply system of all types;

• logistics sustainability, together with technological and investment sustainability, forms production sustainability of the technological links of the resource supply system;

• taking into account commercial and production sustainability, economic sustainability of the resource supply system can be determined;

• along with other types of sustainability, economic sustainability allows formation of sustainability of the resource supply system in general.

Conclusion.

Thus, the following elements of scientific novelty are obtained in the article:

• the essence of sustainability as of a component of reliability of the resource supply system (Pics. 3, 4, 5, and 7) is clarified;

• definitions of sustainability, durability, flexibility, survivability, static nature, dynamism, reliability, maneuverability and security of resource supply systems are suggested;

• sequences of determining sustainability of the resource supply system are proposed (Pics. 10 and 11).

Besides, from the point of view of logistics, it is proposed to replace the concepts of «value management» and «supply chain management» with more correct concepts in terms of content, respectively, «value flow management» and «process flow management» (not to be confused with «stream processes», i.e. [24, p. 24]).

Further research assumes:

• to develop a methodology for determining sustainability of value flows of end users of resources which is a new concept in the field of logistics and marketing as concepts of enterprise management;

• to clarify the content of methods for determining the remaining (except for sustainability) components of reliability of resource supply systems;

• to create theoretical and methodological prerequisites for determining reliability of technological, trade and logistics links and, on their basis, of channels, chains, fronts and echelons of the resource supply system in various commodity (goods, products and services) markets;

• to suggest recommendations on adjusting the content of SCOR- and DCOR-models, which form the basis of supply chain management or, in the opinion of the author, process flow management.

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EDITORIAL NOTE

The assessments, judgments, and approaches suggested in the article require a debate, and its publication is called to initiate the discussion. Offering the paper to the attention of the readers, it is worth noting aspects highlighted by the reviewers and considered by them disputable or ambiguous. They comprise the role of transportation; substantiation of the focus on resources in supply; relationship of logistics and supply chains; missing consideration of the requirements set by ISO 28002 standard, describing sustainability of supply chains; suggested concepts of value flow management and process flow management; propriety of proposals on correction of SCOR and DCOR models. Hence, original author's approaches are maximally preserved to offer a possibility to get acquainted with suggested concept. For its part, the journal is fully available to consider well-reasoned reviews and articles to develop the discussion. ●

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