Anna Brzozowska¹, Mariusz Dacko², Oleg O. Gorb³ IMPORTANCE OF LOGISTICS IN SUSTAINABLE DEVELOPMENT OF RURAL AREAS

The paper addresses the issue of rural areas development as desirable changes in the economic and social potential of rural areas. For the development of rural areas to be sustainable, such changes should not only be economically justified but also socially desirable and ecologically acceptable. The authors, emphasizing the systemic context of the issue of sustainable development for rural areas, state that management of this development should be based on the experience of the systemic school at strategic level and on logistics at operational level.

Keywords: sustainable development; rural areas; logistics.

Анна Бжозовска, Маріуш Дацко, Олег О. Горб ЗНАЧЕННЯ ЛОГІСТИКИ ДЛЯ ЗАБЕЗПЕЧЕННЯ СТАЛОГО РОЗВИТКУ СІЛЬСЬКИХ ТЕРИТОРІЙ

У статті розглянуто питання забезпечення ефективного розвитку сільських територій через збалансоване використання їх економічного та соціального потенціалів. Доведено, що для сталого розвитку сільських регіонів такі зміни повинні бути не тільки економічно виправданими, але й соціально бажаними та екологічно прийнятними. Висвітлено системний контекст цього питання, оскільки забезпечення ефективності такого розвитку має спиратися як на досвід стратегічного управління, так і на ефективність логістики оперативних рівнів.

Ключові слова: сталий розвиток; сільські території; логістика. Літ. 41.

Анна Бжозовска, Мариуш Дацко, Олег Горб ЗНАЧЕНИЕ ЛОГИСТИКИ ДЛЯ ОБЕСПЕЧЕНИЯ УСТОЙЧИВОГО РАЗВИТИЯ СЕЛЬСКИХ ТЕРРИТОРИЙ

В статье рассмотрены вопросы обеспечения эффективного развития сельских территорий через сбалансированное использование их экономического и социального потенциалов. Для устойчивого развития сельских регионов такие изменения должны быть не только экономически оправданными, но и социально востребованными и экологически приемлемыми. Представлен системный контекст этого вопроса, поскольку обеспечение эффективности такого развития должно опираться как на опыт стратегического управления, так и на эффективность логистики оперативных уровней.

Ключевые слова: устойчивое развитие; сельские территории; логистика.

Introduction. Development never refers to only one aspect of an economic reality. In accordance with the general concept of balance, none of economic values is created in isolation. Thus, a specific economic value cannot undergo changes without entailing changes in other values (Lange, 1973). In increasingly complex economic reality, improvement in one of economic indicators is accompanied by changes (not always desired ones) in the other. This interdependence is not limited to the field of economics, because economic system enters into numerous interactions with social systems and the environment. Economic and social development may be conducive to each other, similarly to non-antagonistic relations known in ecology and

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referred to as mutualism (Dacko, 2011a). However, relations between economy (and sometimes also community) and the environment often take the victim-predator form which we know from biology (Bajerowski, 2003; Dacko, 2010; Dacko, 2011a). Moreover, discrepancies arise not only in mutual relations of these subsystems, but also within each of them. F. Waelchli (1992) suggests that every real situation should be treated as a whole. We should remember that it is impossible to effectively manage a complex system if we understand and control only a part of it even if we consider this part as the most important one.

Literature review. One of practical ways of coping with the complexity of the real world and its development is to implement contemporary management theories.

W. Chmielewski and P. Rogala (2003) state that the prerequisite for ensuring proper development, both at local and regional scale, is appropriate management. The role of management was stressed in the Declaration on Sustainable Development signed in 2002 during the Earth Summit in Johannesburg. It included a provision which obliged international community strengthen and improve management at all levels to ensure effective implementation of Agenda 21, Millennium Development Goals and Implementation Plan from Johannesburg.

These contemporary management and organisation theories postulated in development creation include logistics the subject of which becomes particularly important today, because in an increasingly complex world there is also a successive growth in the intensity of flows of people, information, matter and energy (Kalinichenko et al., 2014). It is in logistics, which looks for the methods of these flows optimization, that we place huge hopes today expecting it to increase the economy and effectiveness of economically used resources through rationalisation of their movements (Marenych et al., 2014). In our context logistics can be treated as a tool for sustainable development.

The research objective. The postulate of sustainable development has grown into a paradigm. It is an element of a strategy and a mechanism of action of both individual entities, institutions and companies, and whole sectors of the economy (e.g., agriculture, forestry, mining industry, water transport etc.). It is a subject of international agreements and EU legislation. According to this paradigm, desired changes in economy should be accompanied by the care for closely related ecologic and social spheres.

Sustainable development is a concept examined in various spatial categories. We can talk about its development in the global perspective, its development at the level of individual countries and their regions or local development. There is also additional delimitation, with the development of cities and rural areas being examined separately. It is justified both from the perspective of economics and logistics. The level and quality of life usually vary significantly between urban and rural areas. There are also differences in the structures of employment and income, specificity of investment and consumption, access to infrastructure, scale of ecological issues, or specificity and intensity of movement of goods, information and people. Thus, the needs in terms of logistic support for rural areas are different from relatively better known needs of urban areas.

The paper addresses the issue of balancing the development of rural areas through the use of today's logistic solutions. These issues are related to each other in many aspects. The aim of the paper is to comprehensively evaluate these shared problems of sustainable development and logistics.

Key research findings.

Systemic context of rural areas development. The issues of rural areas development, due to their interdisciplinary character, are a subject of interest for representatives of numerous disciplines, such as economics and management, sociology of rural areas and social psychology, agricultural science and environmental protection, geography, statistics, urban and spatial planning (Kalinichenko and Minkova, 2014). However, none of these disciplines should usurp the primary role here.

In research projects on the development of rural areas, multidisciplinarity of a team is necessary. It should comprise not only economists and sociologists, but also geographers and statisticians, experts in agriculture and law. Such a team was appointed at Instytut Rozwoju Wsi i Rolnictwa Polskiej Akademii Nauk for a large research project during 2009–2011. Its subject were social and economic conditions for sustainable development of rural areas. Thanks to several years' cooperation between the representatives of various disciplines and academic centres and the representatives of local authorities and communities, knowledge about the specificity and conditions of sustainable development of rural areas has not only been significantly increased, but also organised and then propagated in the world of science, among local authorities and representatives of governmental administration. It also raised awareness about the interdisciplinarity of this issue and its systemic context (Boltromiuk, 2011).

M. Stanny (2013) stresses that studies on rural areas development basically refer to the functioning of a complex organism (natural, social and economic environment) where a range of factors interact with each other. M. Dacko (2011a) expresses the opinion that if we disregard numerous factors which are linked and have a joint effect on rural areas management, then we start to rely to a large extent on intuition, which is quite unreliable as far as complex systems are concerned. Therefore, according to the author, management of rural areas development, which are basically complex systems, requires a holistic approach (Dacko and Dacko, 2009; Dacko, 2010; Dacko, 2011a; Dacko, 2011b). Promising results may be brought here by application of system dynamics. Awareness of system dynamics allows all management decisions be made with more awareness their consequences (Lukaszewicz, 1975). This is proven by (Kronenberg and Bergier, 2010), who present the model of sustainable development of the Barycz River Valley. Graphical language of cause diagrams allowed these authors successfully combine various observations, experience and specialist knowledge of the project participants. When the gradually built network of links and relations was taking shape, the identification of strengthening and balancing feedback loops started to reveal the macrostructure of the system. This made the character of fundamental areas and problems in the development of this region more comprehensible to stakeholders.

If in the case of rural areas development we are dealing with systems, then we should bear in mind and respect the laws of systems while managing these areas, both generally and in logistic management of flows of people and goods in rural areas. According to one of these laws, the system structure determines its behaviour. Thus, if we want to effectively impact the behaviour of a system, to rationalise its flows and

resources, first we have to learn about the structure of the system, its key elements and relations between them – as J. Kronnenberg and T. Bergier (2010) did in the case of managing sustainable development of the Barycz River Valley. We should also constantly bear in mind that in systems changing each element affects all the other. Of importance is also general propriety of systems reflected in the fact that growth in their complexity is accompanied by the growth in intensity of flows, which should be managed homeostatically as in the case of a living organism (Melnychuk et al., 2014). The nature copes with this challenge very well. While people form more and more complex systems whose operation becomes then beyond our capabilities. The moment homeostat fails, the system inevitably falls into dysfunction and growing imbalance.

Summing up, the complexity of the issues of rural areas, which includes the issues of agriculture, not only requires a comprehensive, systemic view on their development, but also leads to a natural need to control this development in a special, i.e. sustainable, manner.

Rural areas development is understood in different ways, however its dynamics is generally determined by two basic notions: space and time. The classicist of spatial planning A. Losch (1961) stated once that if everything happened in the same time, then there would be no development. If everything remained at the same place – there would be no distinctiveness. Paraphrasing, we can say that space is a set of distinctivenesses which develops with time.

In this context, rural areas development can be defined as desired spatial and temporal changes in a dispersed (compared to city) economic and social potential of rural areas. According to M. Stanny (2013), this perspective includes the issue of creating appropriate conditions of living and income earning opportunities in rural areas and local labour markets. It is also a challenge for logistics, as the specificity of rural areas development requires that while striving to achieve this improvement in quality of life we should bear in mind the necessity for maintaining the intensity of land use planning. It is characterised by deconcentration of population and economic activity, and smaller (compared to cities) anthropopressure (Stanny, 2013). The aim of rural areas development is thus to create such social and economic structures that will ensure decent income to rural dwellers, satisfy their aspirations, improve access to public goods and services, reducing at the same time disadvantageous phenomena of rural life. In this context, M. Stanny (2013) points out the monofunctionality of the economy, agrarian overpopulation, depopulation and population ageing, unemployment, poverty and marginalisation. Even in this context, we can see some contradiction of objectives, discovered in the cybernetic theory of systems by R. Ashby (1963) and called the law of veto. With development and revival, there is inevitably increased movement of people and goods, growing anthropopressure and a natural tendency to intensify and concentrate activity – phenomena that are rather undesirable in rural areas. Contradictions may also be seen in relations: profitability – ecologization and access to goods and services – population deconcentration. It may be equally difficult to reconcile the postulate of the development of rural people's non-agricultural earning with the issue of reducing daily movements between the city and the countryside and preserving rural culture and tradition. In this context, management of rural areas development and their logistic support appears to be a huge challenge for managers and planners. We can say that it is a holistic management of contradictions and creative pursuit of the optimum through the states that are frequently far from the optimum and satisfying only at a given moment.

Large part of the factors facilitating the development of rural areas is subjective in nature, hard or even impossible to measure. Generally, it is easier to evaluate, quantify and compare such development factors as infrastructure resources, entrepreneurship, size and quality of human capital, structure and specialisation of local economy. However, difficulties may occur, while evaluating location. This factor is real impacts the development in a multifaceted way, changing over time and depending on the events in neighbourhood, region or country. Location is not the only example, as in the development of rural areas there are a range of important soft factors, which are difficult to objectivise, measure or compare. They include, among others: managerial and logistic factors, creativity and innovativeness, ecologic awareness of rural community, its identification and bonds, social and local authorities' activity, environmental situation, cultural and historical heritage. Many of these factors impact each other, and using the language of system dynamics: they create feedback loops.

The immanent feature of the basic development factors of rural areas is their limited mobility (in a short run). Infrastructure, human capital, the structure of local economy and its innovativeness show significant inertia. Even brand or narration are usually developed over years. In a short run it is difficult to change the disadvantageous state of lack of identification or bonds of local community. There are also factors that cannot be changed at all. An example is location. It is by nature unchangeable, but depending on changes occurring in the environment it may become an important asset or a weakness. Therefore, one of more important issues in the development of rural areas is not so much increasing the resources as improving the effectiveness of using what is possessed removing the internal barriers for growth.

Sustainable and multifunctional development of rural areas. Thus, the development of rural areas we define as desired spatial and temporal changes in a dispersed (compared to city) economic and social potential of rural areas. The question arises: what these changes should precisely be so that we could say that rural areas development is sustainable? They should not only be economically justified but also socially desired and ecologically acceptable, and at the level of rural entrepreneurship – included in the structure of supply chain management.

Literature on the subject stresses that sustainable development is first of all a process and emphasizes its systemic and dynamic character distinguishing 3 subsystems: economic, social and environmental (Michnowski, 1995; Bajerowski, 2003; Domanski, 2004; Dacko, 2010; Dacko, 2011a; Dacko, 2011b). Sustainable development of rural areas should thus ensure the maximisation of objectives on the one hand, and removal of internal contradictions in the functioning of these 3 subsystems on the other:

- environmental system (preserving biodiversity, durability and productivity of agroecosystems, protection of rare and disappearing species of plants and animals, elimination of extreme threats);

- economic system (continuity and stability of production and consumption, increased prosperity of inhabitants, development of non-agricultural activity that

hasn't a negative impact on the environment, improving the effectiveness of local economy and its diversification);

 social system (preserving cultural diversity, institutional durability, social justice and public safety, improved access to technical and social infrastructure, integration of rural community and building its identity).

According to R. Constanza (1991), sustainable development is when the relation between human created dynamic economic systems and dynamic ecological systems ensures: stability and development of human life, chances for development and selffulfilment of individuals and preservation and development of human culture. Examining the sustainable development of rural areas in the light of the theory of systems, it's worth paying attention to the issue of consistency (Dacko and Dacko, 2009). Consistency is reflected in the fact that changes in one element of a system have a significant impact on changes in the remaining elements. Thus, for economic systems to be able to permanently coexist with ecological systems in rural areas, the former cannot exclude or destroy the latter. Strict fulfilment of this postulate would certainly be very difficult, as practically every economic activity of a human being brings some external costs in the form of environmental losses. Therefore, according to L. Michnowski (1995), human-created systems respect the principle of consistency, when in the overall assessment of their functioning externally constructive elements (facilitating the development of other elements of the system) visibly outweigh external destructive elements.

A very important condition for sustainable development of rural areas is the relation between a human being and the environment. The biggest role is played here by a human being, a person's honesty and responsibility, ecological awareness and sensitivity. According to D. Kielczewski (2001), Poles' ecological awareness is low and limited to mostly verbal declarations. When it comes to actual choices, we still prefer solutions that are more comfortable, simple, cheaper at a given moment, but negatively affecting the environment and expensive in the long run. Rural areas are still a place of environmentally destructive abuse, i.e. discharge of waste water into fields, ditches and rivers; creating wild rubbish dumps; placing dangerous waste in forests; illegally obtaining wood raw materials; heating houses by burning rubbish releasing harmful substances into atmosphere. Thus, rural areas should not only be the beneficiary of life quality improvement projects, but also of ecological education and awareness raising.

W. Musial (2008) noted that at the level of material production and services, implementation of the sustainable development concept usually requires additional costs, of both production and consumption costs. They are not readily accepted either by households, or enterprises. As a result, in real activities it is still hard to overcome the stereotypes according to which the idea of sustainable development of rural areas is a burdensome reflection of altruistic and excessive care of a community for natural environment.

T. Nitkiewicz (2013) additionally points out the huge role of eco-innovations in implementing sustainable development in agricultural holdings, which requires additional costs and strategic orientation in managing them. Although there are instruments of financial support for agricultural holdings to implement eco-innovations, the fulfilment of the second condition is difficult due to awareness barriers and distribution of entities of this sector in Poland.

Sustainable development of rural areas is closely and inseparably connected with their multifunctionality. According to A. Czarnecki (2009), multifunctionality gains the status of a strategy, policy or development path for rural areas whose main thread is diversification of employment for rural dwellers. M. Stanny (2013) thinks that in developed countries multifunctionality and development of rural areas are today almost synonymous terms involving a set of actions adjusted to specificity of rural issues, created both for rural communities and the implementation of cross-society intentions towards rural space. The development of rural areas is no longer focused exclusively on productive functions of agriculture. Its aim is rather to generate ruralness whose value has been clearly growing over the last years. It can be seen e.g. in migration of people from cities to suburban countryside, the phenomenon of "second houses" or growing popularity of rural agrotourism. Multifunctionality here means a certain independence in rural areas development from the development of agriculture. While it is still a very important branch of rural economy, equally important is non-agricultural development of rural areas (Stanny, 2013). Agriculture ceases to be the main source of income for rural dwellers. Multi-skilling of agricultural families is often a stage on the way towards complete abandonment of agricultural activity. It is clearly confirmed by statistics: around 60% of Polish rural dwellers do not declare any connection with agriculture.

Sustainable, multifunctional development of rural areas is thus a specific challenge for logistics, as improvement of life quality and opportunities for rural dwellers finding employment outside agriculture may take place through absorption of free labour force in nearby cities or through creating jobs in rural areas. Both these solutions, being connected with flows of people and goods, require multifaceted optimisation (logistics of rural areas), so does the service of agricultural sector (agrologistics).

Multifunctionality requires a well-thought-out introduction of new non-agricultural functions into rural space, in the systemic context and in particular many-sidedness of consequences from each interference with economy. It brings both chances and threats. The importance of multifunctionality is naturally appreciated. It is explicitly stressed by in (Zegar, 2008; Czarnecki, 2009; Stanny, 2013). According to J. Zegar (2008), multifunctionality is, along with entrepreneurship and endogeneity, a basic indicator which determines the direction of social and economic development of rural areas. We must acknowledge that in globalised information society, mobility of production factors and economic entities became both virtue and necessity. It is mobile people and mobile enterprises that win, but agricultural sector doesn't belong to them. J. Wilkin (2010) quotes an interesting observation by Bauman who expressed the view that transnational capital is circulating more and more freely in the global space searching for "green pastures". Searching for a foreign investor is often inscribed in the policy of rural areas development. Such an investor appears as a big chance for increasing employment and reviving local economy. However, capital does not respect patriotism (especially local one). After exploiting a niche that has been noticed the foreign capital abandons it without scruple. There is only rubbish left -aproblem that local people have to solve. It is a clear warning against too enthusiastic introduction of new non-agricultural functions into rural space, especially in the form of foreign capital. Unlike other activities, agriculture is still connected with the rooting in natural environment and, perhaps, worse-paid at the market but socially very desired durability and stability. Once again we should say that management of sustainable development of rural areas is management of contradictions and an art of pursuing the optimum through states that are often far from the optimum and satisfying only for a given moment.

Role of logistics in balancing multifunctional development of rural areas. What role does logistics play in sustainable and multifunctional development of rural areas? This role, though important, is rather not a leading one, as logistics is more operating, executive in character. When looking for a strategic tool for its management we should point to system management propagated by (Lukaszewicz, 1975; Habr and Veprek, 1975; Cempel, 2003; Senge, 2006).

Both logistics and sustainable development have an interdisciplinary character. The common area of their interests is the optimisation of economic use of environmental resources. Looking at logistics as a practical implementation of praxeological principles of good work we can say after (Chaberek and Karwacka, 2009) that logistic processes are actions that should have a consistent character and at the same time function in an efficient way. These actions include, among others: packing, moving and storing the right things in a right place, taking into account quantity, quality, time and costs. Thus logistics, in principle, is focused on the consistency of actions and elimination of waste of resources in economic processes, guaranteeing they are maintained in a specific, desired quantity and quality (Lis et al., 2014). This reduction of resources waste is one of important aspects in sustainable development, as pointed out by R. Domanski (2004) and Dacko (2011a, 2011b).

Intrinsically and inseparably logistic process is connected with multifactorial management which defines norms and strategies of action, transport and storage operations in various environments, taking into account the postulate of costs minimization of implemented projects (Dlugosz and Zimniewicz, 2009; Foltynowicz et al., 2008). A. Bruska (2012) noted that due to a symbiotic dependence between management and logistics, there is a growing group of managers who appreciate not only commercial values of this correlation but also contribute to the development of logistics in numerous areas of daily life. In this respect, there is certainly a large educational niche and it's worth thinking about filling it in the aspect of sustainable development. All 3 components of sustainable development would benefit if rural dwellers are familiar with basic knowledge on logistics with reference to economisation recommendations by T. Kotarbinski (1965), i.e. regarding management of time, space, energy and matter. We rarely realize how much waste in every day life is caused by mere ignorance of these rudiments of praxeology.

The process of satisfying economic needs leads to activation of a flow of goods, resources, or movement of a customer, or combination of these movements – depending on a need. According to A. Bruska (2012), aspiring to economically effective implementation of these processes forces the formation of flows in an integrated way, in accordance with the concept of logistics as part of optimised logistic systems.

A number of valuable models in this respect can be developed by observing the functioning of producer groups and direct sale points in France (Dacko and Plonka, 2011). Groups of agricultural producers that sell their goods together have a long tradition there and a strong theoretical foundation. In France, in the process of forming

a producer group several farmers obtain capital together, usually opening a collective point of sale. An important role in this initiative is played by an agricultural advisor who conducts economic analysis of the whole project, helps farmers in negotiations with banks and shows possibilities for obtaining subsidies. Advisor also suggests farmers a location where from the perspective of logistics the opening of a new point of sale should have the biggest chance for success. Planning a location of a direct sale point requires conducting market analysis and finding out, among other things, the distribution and the number of inhabitants of a given commune, because it is a very important factor which determines the size of expected demand for agricultural produce. Based on the knowledge about the number of inhabitants and the structure of food expenditure, potential turnover of a shop is determined. According to French advisors, a shop should be so located that the time it takes for a certain group of customers to get to it is not longer than 12 minutes. Further extending this time may effectively discourage customers. According to Reilly's law of retail trade, locating a retail facility in a given place attracts not only people from that place but also from nearby places (Mruk, 2003). However, the bigger is the distance to a shop (especially a smaller one), the narrower is its area of influence on potential customers. Analogy with the law of gravity suggests that access to relatively small shops of producer groups should be possibly most convenient compared to larger supermarkets and shopping centres. Even a determined consumer, who looks for good quality and healthy food, will not waste time for a too long journey. From the perspective of logistics, location of a point of direct sale is very important. It determines optimization solutions in terms of controlling the deliveries of goods, their storage and distribution. In French points of direct sale, farmers, members of a producer group, take turns at selling goods of the whole group by themselves (or sometimes they employ people). This shortens the logistic chain, with radical improvement in profitability. Logistic support of such entities, similarly to support of agribusiness sector, is the domain of agrologistics, which should be regarded as part of logistics of rural areas (Klepacki, 2011). These solutions are certainly worth copying in other rural areas as there is a significant demand for them on the consumer side. Unfortunately, Polish farmers' interest in producer groups is small. At the end of 2010, there were only 623 formal producer groups in Poland, operating in the form of companies or partnerships, associations or cooperatives. J. Wilkin and J. Nurzynska (2010) explain this with historically conditioned fear among farmers of forming a formal group, which is associated with forced collectivisation of Polish rural areas in the 1950s.

Given the context of sustainable development, it's worth listing, after, some of the tasks of logistics of rural areas and agrologistics (oriented towards servicing agribusiness) (Nizinski and Kolator, 2007):

- ensuring connections to enable the supply of products and services that meet the needs of rural dwellers;

- creating conditions for access to infrastructure;

- shaping a system of flows in a way that is beneficial for natural environment protection in terms of air, water and soil, as well as preserving the natural state of ecosystem;

- supporting the use of fixed assets (including technical devices) by keeping them functionally operational;

- feeding the agribusiness sphere with production factors – materials, chemical fertilizers, machines and equipment;

- creating systems for physical distribution of plant and animal products;

- shaping the conditions for rational use of fixed assets and other production factors;

- internal and external transport of cargo among agribusiness players;

- providing information of appropriate quality;

- creating an integrated logistic system in a given area.

Here economic and social objectives outweigh the environmental ones. However we must note that the implementation of many of these tasks may have indirect impact on the environment. For instance, creation of the systems for physical distribution of plant or animal products has an economic purpose, but implementation of this objective by entrusting professional logistic companies with distribution may lead to decreased use of resources (including energy carriers).

Logistics as a tool for sustainable development organizes and optimizes flows, reducing the pressure on rural areas infrastructure, decreasing economic (the use of grease and oils) and ecological (pollution, running down wild animals) costs of movements. Introduction of the concept of sustainable development into logistic processes transforms logistics into the so-called "sustainable logistics" whose aim is to, among other things, minimise the detrimental effect on the environment improvement of local life quality etc. (Bajdor, 2012).

In logistic management of rural areas, we can distinguish 4 elements which belong together in a logistic chain: logistics of supply, logistics of production, logistics of distribution and logistics of disposal. These processes have to be integrated for intended effects to be achieved. Here also we can see a need for systemic approach, in which the processes of supply, production, distribution and disposal are treated as one, intentionally synergically organized to serve the cause of sustainable development of rural areas.

Conclusion. Logistics and sustainable development are connected by the issue of optimisation of economic resources. Various economic processes taking place in rural areas require the activation of flows of goods and resources, movement of customers, and sometimes combination of these movements. Striving at economically effective performance of these processes forces shaping flows in an integrated way, in accordance with the concept of logistics as part of optimised logistic systems.

Solving socioeconomic and environmental problems in rural areas has never been an easy task, because contradictions of systemic origin often occur here. Management of sustainable development in rural areas should be based on the experience of the systemic school at strategic level and on logistics at the operational one.

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