

INFORMATIONAL SUPPORT OF THE RURAL AREAS' DEVELOPMENT

Iryna Honcharenko¹, Liliia Kozachenko², Tetiana Moroz³

Abstract. The *purpose* of the article is to determine peculiarities of using modern communications and telecommunications, virtual space, assessing the availability of relevant information that reflects all aspects, processes which are taking place in the economic, social life, and ecology of rural areas. Another purpose is the development of directions for solving existing problems. *Methodology.* Methods for theoretical synthesis, analysis, and comparison were used in the process of determination of features and substantiation of the basic concepts. *Results of the research.* It was revealed that in the information provision of Ukrainian rural areas functioning has accumulated a considerable potential. There are such crucial strengths as an existence of a developed infrastructure of state statistics, hierarchically structured organizational structures (centre, region, district) that can provide information collection and processing, as well as its distribution in the opposite direction. Also, there are highly skilled IT specialists and organizational opportunities for their training and retraining. Among other points are the following: an existence of the databases, where scientific and technical information were accumulated; an existence of the databases of modern agricultural technologies; and there is also a developed research infrastructure. But today, the level of use of automation tools continues to remain extremely low in the rural management authorities in Ukraine. The long-standing experience in using information technologies by enterprises and organizations is practically not used in the management of territories. Full informational support of rural areas is possible in case of the organization of the qualitative monitoring of their development with simultaneous taking into account further forecasts for a set of most characteristic indicators for the territory in a certain period of time. A promising task is the integration of Ukraine's information systems into the international information space. This task involves synchronizing national standards, methodologies, and tools with international standards, as well as improving communication with international scientific and information centres. *Practical implications.* The creation of an integrated information and communication system of rural areas will help to solve the tasks of effective territorial management. The main components of this system will be the following: the developed infrastructure for access to information; informational systems of local self-government bodies; informational monitoring systems; e-commerce and marketing systems; consulting electronic services; distance learning and retraining systems. Within the enterprises, it is necessary to use information and computer technologies for the accumulation of data about the social, economic, and ecological activity. It is advisable to supplement the monitoring information regarding the development of rural areas by subjective assessments, results of sociological surveys. An improvement of the software system "Household Accounting for Village Councils" involves the use of client-server technology with the combined use of telecommunication and print media. A promising area for research and management of rural areas on the basis of the spatial representation of processes is the use of geographic information systems and global positioning. *Value/originality.* The integrated informational and communicational system of rural territories will ensure the efficiency and quality of their information support and will become the basis of effective management.

Key words: informational support, rural territories, development monitoring, geo-information systems, information and computer technologies.

JEL Classification: C82, D80, P32

Corresponding author:

¹ Mykolayiv National Agrarian University, Ukraine.
E-mail: honcharenko@mnau.edu.ua

² Mykolayiv National Agrarian University, Ukraine.
E-mail: kozachenko15@ukr.net

³ Mykolayiv National Agrarian University, Ukraine.
E-mail: moroz@mnau.edu.ua

1. Introduction

An efficient development of rural areas is a prerequisite for sustainable development of the country. The issue of the formation and improvement of their infrastructure are the ones of particular relevance, the priority direction of this issue should be considered an information support. Under the modern conditions of innovation development, with the active use of the latest means of communication and telecommunications, virtual space, there is an objective need of the availability of relevant information that reflects all aspects, processes, and their features, which take place in economic, social life, and ecological situation of the rural territories.

In the general sense, an information provision is a set of methods and facilities for the placement and organization of information, the quality of which largely depends on the reliability and quality of the management decisions (Oliynichenko, 2010).

An informational support of the rural areas' development is a link that integrates production, local government, community, and provides an opportunity to receive, group, and analyse distributed and centralized information resources. The main sources of information are state statistics bodies, profile ministries, regional and district administrations, and united territorial communities. Also the results of a poll of representatives of rural areas, public opinion, expressed during scientific conferences, seminars of specialists, meetings of citizens are very important.

The main problems of informational support of rural areas are: insufficient level of information flows for all key users; the usage of paper technologies in information gathering, processing, and analysing; lack of the statistical indicators at sectoral, regional, and state levels.

2. Features of the monitoring of the rural areas' development

Formation of the complete information base for the future trends in rural areas forecasting is possible by the organization of qualitative monitoring (John C. Allen, Don A. Dillman, 2018).

Under this term, we understand the system of observation, assessment, and forecast of their economic, social, and ecological status, which makes it possible to characterize all peculiarities of development of a certain rural territory, also taking into account the negative and positive economic, social and environmental transformations associated with the transition of the rural settlement from one state to another.

One of the features of the monitoring of the development of rural areas is the continuous observation and assessment, with taking into account further forecasts for the set of indicators that are the most characteristic for the territory in a certain period of time.

The main goal of the development of monitoring system' functioning is the thorough study of the state and trends of rural areas and their separate components (Christoforou, 2017).

The main function to our opinion should be considered an informational one, which provides for users timely, reliable, complete, and systematic information about economic processes and trends of their development, social situation, and ecological status of rural areas, identification of problems and identification of ways to solve them.

Under such conditions, the scheme of the monitoring process of rural development should include the following steps (Figure 1).

The main object of the development of rural areas' monitoring is the processes that occur within them (Figure 2).

An effective functioning of the system of monitoring and regulation of rural development must be ensured by the competent state authorities on the appropriate legal basis; co-ordinated work between the management bodies on the collection, transmission, and storage of primary information (agencies of statistics within the district), processing and systematization of received information, calculation of integral indicators (departments of economic management of the district state administrations), calculation of the index of economic, social, and ecological development of a certain rural territory and its monitoring (departments of regional development of rural areas of district state administrations), normative-legal forms of storage and protection of information, formation of territorial (district) information funds for monitoring and control of the development of rural areas, which will guarantee information security.

3. Foreign experience in informational support of rural territories

The European Commission aims to create a comprehensive digital society that benefits from a single digital market. The digital society in Europe is developing thanks to the benefits provided by the digital single market strategy. The European Commission is taking concrete measures to promote cross-border digital public services and to ensure the use of digital tools and systems in order to provide better e-government for citizens and business.

The European Commission develops a policy aimed at rising European citizens' digital skills with such initiatives as employment programs for Europe. These measures will help Europe to grow into a more digital society (Creating a digital society, 2017).

The European Commission launches the "European Cloud Technology Initiative – Creating a Competitive Data and Knowledge Economy in Europe" to take advantage of the data revolution. Under this initiative,

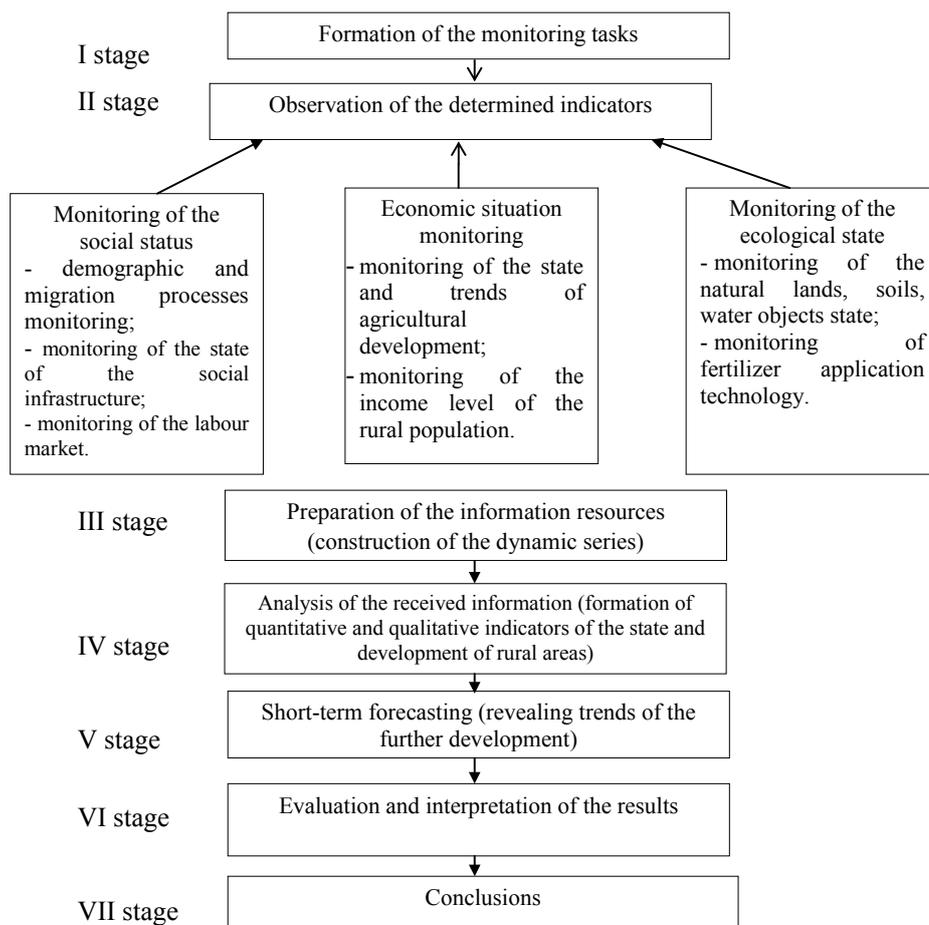


Figure 1. The main stages of the development process of rural areas' monitoring

the European Data Infrastructure will combine supercomputer world-class capabilities with high-speed connectivity, advanced data and software for science, industry, and the public sector. It will stimulate open science and innovation by providing researchers with a wealth of scientific data (Digital Single Market Policy e-Infrastructures, 2018).

In Canada, rural development and rural development issues are addressed by REDI (Rural Economic Development Intergovernmental), which provides financial and technical resources for the development of existing ones and the creation of new types of economic activities, thus helping farmers increase the economic potential of their villages (Cornelia Butler Flora, Jan L. Flora, Stephen P. Gasteyer, 2018).

Another positive experience is the activity of the governments of developed countries, which attract young people for the more effective development of rural areas. They develop special programs designed to support the younger generation in the development of entrepreneurship in the countryside and agricultural activities (Brian McGrath, 2017). One of the real examples of this is France, where a young person who presented his own real project for the development of

a personal household has the opportunity to receive a state subsidy for development and settlement, the volume of which depends directly on the settlement area, the farther away from the city, the greater the amount and the long-term special loan with reduced interest (Asimina Christoforou, Elena Pisani, 2016). Also, the state cares about raising the skills of young people at the expense of specially created funds.

The Canadian government has developed a state program "Achievements of Rural Youth", the main purpose of which is to improve the skills of rural youth (Tony Jackson, Etienne Nel, Sean Connelly, 2017). The implementation of the program provides organization and implementation of applied and theoretical training, which provide receiving of knowledge and skills for initiating and supporting the economic development of rural areas.

4. Information support for the development of rural areas in Ukraine

The problem of informatisation of rural territorial entities requires a comprehensive solution. Researches confirm that the information provision of functioning

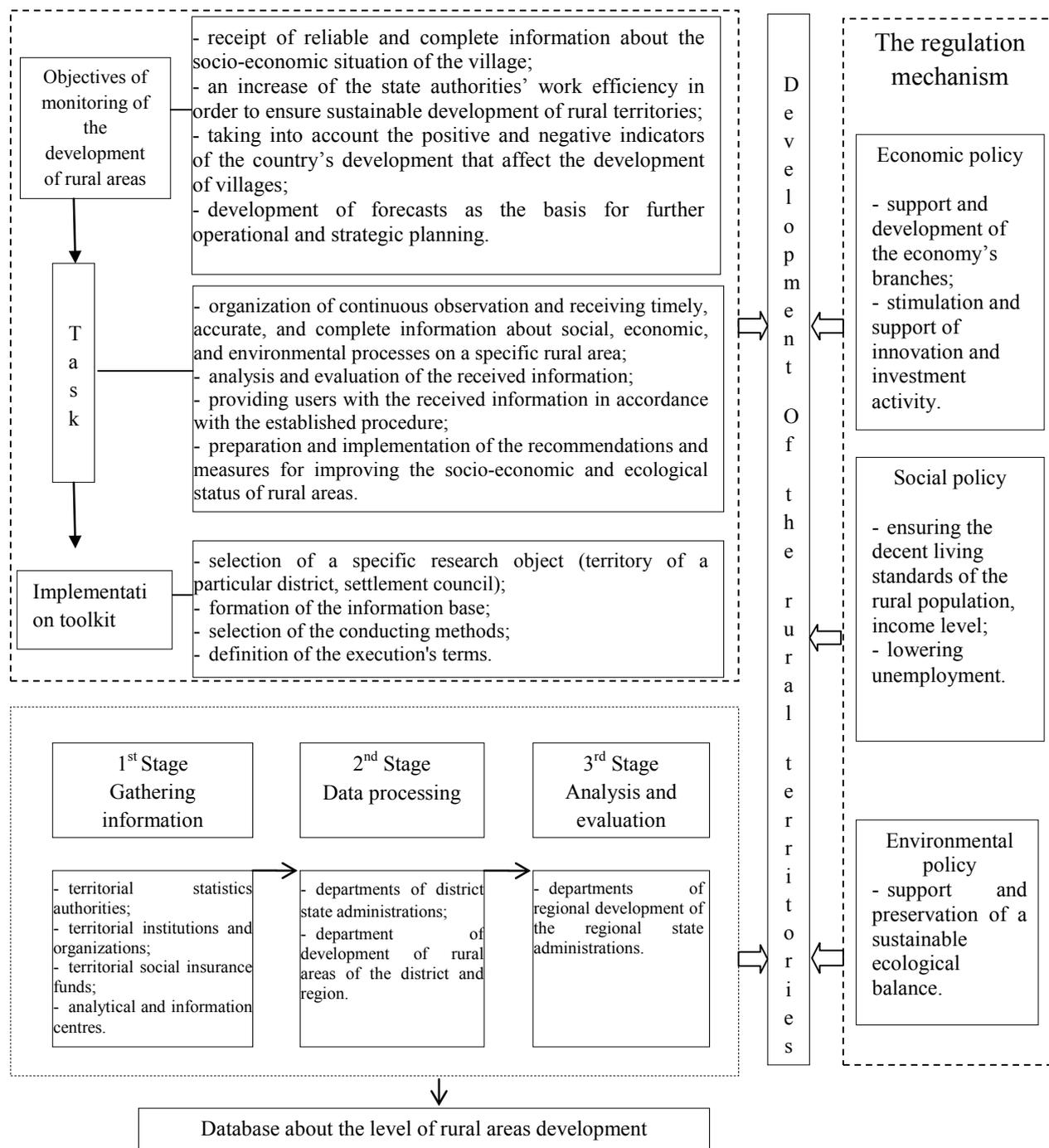


Figure 2. Structural and functional scheme of the monitoring of Rural Development

of rural territories has accumulated considerable potential: there is a developed infrastructure of state statistics; hierarchically structured organizational structures (centre, region, district) are available and can provide information collection and processing, as well as its distribution in the opposite direction; there are highly skilled IT specialists; available organizational opportunities for training and retraining of IT specialists; scientific and technical information is accumulated and databases are created; there are databases on modern

agricultural technologies; there is a developed research infrastructure.

But today, the level of use of automation tools in the rural development authorities in Ukraine remains extremely low. The long-standing experience in using information technologies in enterprises and organizations is practically not used in the management of territories. Despite the local use of computer technology, it should be noted that the regional level management systems in Ukraine today are based mainly on paper technology.

To the problems of existing information systems of rural areas should be attributed, first of all, the lack of efficiency and reliability of collection, systematization, processing, and dissemination of information because of the use of outdated technologies; the presence of a significant proportion of poor quality information; shortage and turnover of personnel; significant lack of financial resources; the implementation of narrow-minded interests in the development of information projects, the lack of an integrated approach to the formation of information resources of the territory; the limited technical possibilities of access to national and world information resources for the inhabitants of rural areas. Monitoring of transformational processes in the industrial and social spheres of rural areas is carried out according to the information contained in the passport of the rural settlement. It combines a set of indicators that characterize: socio-economic, demographic, ecological situation, employment of the population, material and technical support, availability and use of land resources, social infrastructure objects, engineering support, etc. (Besdyshna, 2017). Generalized information is the basis for programs of socio-economic development of territories at the local, district, oblast, and state levels developing and is used by managers and specialists of local, district, and regional levels, agricultural advisory services, scientists, teachers of higher and secondary specialized educational institutions who are involved into solving the problems of rural development and improving the living standards of the rural population.

We consider that it is appropriate to supplement the monitoring information regarding the development of rural areas by subjective assessments and results of sociological surveys. Such measures will further provide users with complete and realistic information about the economic, social, and environmental processes occurring on the territory of rural settlements.

Within the country, the program complex "Household Accounting in Village Councils of the District (the City)" functions as a continuation of the program complex "Household Accounting for Village Councils" which, in its turn, involves the formation of consolidated information of village councils. The information base of indicators is updated and stored. The complex is intended for monitoring the development of rural areas of the district (city) and could be used by managers and specialists of district level, agricultural advisory services, scientists.

The current issue is the improvement of the software complex using client-server technology and the joint use of telecommunication and print media.

A tool for the practical implementation of new approaches to research and management of rural areas based on the spatial representation of processes is geoinformation systems (Kaganovich, S. Prisyazhnyuk, A. Prisyazhnyuk, 2017). Land plots, agricultural land, industrial premises, reservoirs, forest areas, roads,

residential buildings have certain space and size, so only spatial database technology can guarantee adequate digital representation, provide analysis of this information, and enable the development of forecasting options for development.

For example, the current and retrospective monitoring of agro-ecological characteristics of soils, the relief of land areas, humidity, environmental pollution, distribution of nutrients in soils, monitoring of the crop cultivation, and the use of areas are the base for the geoinformation system of land use of rural settlements. On the basis of monitoring data and economic-mathematical modelling, it is possible to plan the use of land. Analysis and processing of information provide a calculation of indicators of economic efficiency of planned and actual measures and possible agroecological consequences.

At the first-level stage of GIS, the receiving (input) and visualization of the data about the location of land plots and their characteristics (cadastral information, agro-technical groups of soils, their class quality, land reclamation, nutrient content, various background information) are made (Zhanat Amirzhanova, Velta Parsova, Tlevhan Ahmedzhanov, Karlygash Esimova, 2017). The GIS of the agrarian enterprise should contain the following guides: the guide of coefficients of corrections for granulometric composition of the soil; the guide of the agro-technical groups of soils, which are characteristic for the corresponding zone of Ukraine with marks of the crop yields; the guide of the nutritional value of forage in the southern steppe of Ukraine; the guide of the norms of feeding animals (minimum and maximum permissible); the guide of the norms of crop nutrient requirements (NPK) depending on the output.

At the second analytical level – optimization of use and management of available resources is carried out on the basis of mathematical modelling by taking into account ecological and economic aspects of management. The criteria for the optimization and its purpose are determined. The visual distribution of cultures on land plots is issued.

At the analytical level, such a system should support the decision-making process that means that in the dialogue mode, through the iteration process, the parameters are adjusted and the solution of the models is found. GIS displays after each decision the received data set visually and indicates possible consequences or contradictions. After that, it is possible to adjust the data if the conclusions on these or those parameters are not acceptable, or on the basis of the decision, a managerial decision is made.

The use of global positioning systems is also a promising direction for rural areas (GPS – Global Positioning Systems). Such systems are already quite widespread. The simplest navigator is able to determine the speed, the direction of travel, and deduce it to the destination point. The accuracy of the location is

approximately 15 meters. GPS-navigators are capable of solving both simple navigation tasks (to reach the destination) and complex (choosing the most optimal route) (Christopher J. Hegarty, John M. Foley, Sai K. Kalyanaraman, 2015).

The use of the Internet should be considered as a factor of the information society development and provision of the conditions for the socio-economic development of rural areas, in order to increase access of the rural population to infocommunication services.

In this regard, state support should be provided for the development of the Internet in rural areas of Ukraine and the provision of such services as audio and video communication, e-education, electronic medicine, the creation of distributed scientific networks, e-government, e-commerce, etc. should be encouraged. A considerable attention should be paid to the development of all elements of the telecommunication infrastructure of the Ukrainian segment of the Internet, which will increase the range of services and reduce their value in different regions of Ukraine.

In our opinion, it is necessary to create an integrated information and communication system of rural territories, the main components of which will be: developed infrastructure for access to information; the information systems of local self-government bodies; the informational monitoring systems; e-commerce and marketing systems; the informational and consulting electronic services; distance learning and retraining systems.

It should be also noted that the integration of Ukrainian information systems into the international information

space becomes especially relevant. This task involves synchronizing national standards, methodologies, and tools in accordance with international standards, as well as improving communication with international scientific and information centres.

The development of informatisation and telecommunications of Ukrainian rural areas will enable to achieve significant results in all other types of social and economic activity of society at the expense of a clearer organization, economical spending of all kinds of resources (material, energy, labour, financial, etc.), improvement of working conditions and life of the rural population.

5. Conclusions

Monitoring is the main tool of information provision and the basis of a complete information base for forecasting further trends in rural areas.

Monitoring provides users with timely, reliable, complete, and systematic information about economic processes and trends of their development, social situation and ecological condition of rural territories, identification of problems and determination of ways of their solution. On the bases of departments of agriculture and food, it is worth to organize analytical and information centres, district information funds that will directly monitor the rural areas within the defined area at the district level. Within the enterprises of rural areas, it is expedient to use informational and computer technologies for the accumulation of data about social and economic activity, ecological state.

References:

- Kaganovich, A. A., Prisyazhnyuk, S. P., Prisyazhnyuk, A. S. (2017). An object-oriented information model for territorial system management. *GeoJournal*. Electronic resources. Retrieved 14 December 2017 from: <https://link.springer.com/article/10.1007/s10708-017-9838-z>
- Asimina Christoforou, Elena Pisani (2016). Social capital and rural development in Southern European regions: the case of EU-funded LEADER projects. *Handbook of Social Capital and Regional Development*. United States of America: Edward Elgar Publishing Limited, pp.391-150.
- Besdyshna, Y. S. (2017). Informatsiyne zabezpechennya upravlinnya v ahrarnomu sektori ekonomiky: stan ta perspektyvy udoskonalennya [Information provision of management in the agrarian sector of the economy: the state and prospects of improvement. *Oblik i Finansi*, vol. 78, pp. 6-12.
- Brian McGrath (2017). *Rural Youth in Local Community Development*. Young People in Rural Areas of Europe. New York, London: Routledge, pp. 127-151.
- Christoforou, A. (2017). *Theory and Empirics. Social Capital and Local Development in European Rural Areas*. Palgrave Macmillan: Cham, pp. 43-60.
- Christopher J. Hegarty, John M. Foley, Sai K. Kalyanaraman (2015). *Global Positioning System*. Digital Avionics Handbook, Third Edition. New York, London: CRC Press, pp. 36-42.
- Cornelia Butler Flora, Jan L. Flora, Stephen P. Gasteyer (2018). *Community capitals and community development in a changing world. Rural communities: legacy and change*. New York, London: Routledge, pp. 297-469.
- Creating a digital society (2017). Electronic resources. Retrieved 17 August 2017 from: <https://ec.europa.eu/digital-single-market/en/policies/creating-digital-society>
- Digital Single Market Policy e-Infrastructures. (2018). Electronic resources. Retrieved 23 April 2018 from: <https://ec.europa.eu/digital-single-market/en/policies/einfrastructure>
- John C. Allen, Don A. Dillman (2018). *Gaining Perspective: A Framework for Analysis. Against All Odds Rural Community in the Information Age*. New York, London: Routledge, pp. 25-49.

Oliynichenko, O. M. (2010). Informacijne zabezpechennja jak vazhlyva skladova procesu pidgotovky, pryjnattja ta kontrolju realizacii upravlinskogo rishennja na pidpryjemstvi [Information provision as an important component of the process of preparing, adopting and controlling the implementation of management decisions at the enterprise] *Ekonomika harchovoi promyslovosti*, vol. 3, pp. 38-42.

Tony Jackson, Etienne Nel, Sean Connelly (2017). A Comparison of Resource Equalization Processes for Subnational Rural Governance and Development: Case Studies of England, Scotland, Canada, Australia, and New Zealand. *Handbook of Research on Sub-National Governance and Development*. United States of America: IGI, pp. 117-150.

Zhanat Amirzhanova, Velta Parsova, Tlevhan Ahmedzhanov, Karlygash Esimova (2017). Improvement of geoinformation technologies on the basis of spatial data. *Journal Baltic Surveying*, vol. 17, pp. 28-32.