

**Vitaliy Omelyanenko,***Candidate of Economic Sciences, Assistant Professor of Economic Theory Department,  
Junior Researcher, Sumy State University (Sumy, Ukraine);***Olha Kudrina,***D. Sc. (Econ.), Associate Professor, Official Representative,  
Centre for European Reforms Studies (Luxemburg, Grand Duchy of Luxemburg);  
Head of Economic and Business Department,  
Sumy State Pedagogical University named by A.S. Makarenko (Sumy, Ukraine);***Dmitriy Volodin,***PhD (Eng), Project Manager, FARADI SRL (Turin, Italy)*

### CONCEPTUAL PRINCIPLES OF DEVELOPMENT RESOURCES SECURITY ANALYSIS<sup>1</sup>

*The article deals with the development resources security problem, which is a part of economic security and development management. The development resources security concept general idea is considered based on analysis of set of economic and social resources and numerous organizational and economic forms and processes of resource using. Based on this the classification of development resources is proposed. For security improving we propose to use resource dynamics tree, that consider the stages of some objective achieving with analysis of available resources, and programs matrix, that shows the relationship between different development programs, including hierarchy and resource component.*

Keywords: development resources security, strategy, resources, globalization, economic security, governance, economic system.

DOI: 10.21272/mmi.2017.2-26

**Introduction.** Globalization causes growth of international trade, scale and rate of movement of capital, development of world financial market. Convergence of nations economies has not only positive impact helping to move faster towards economic growth, but at the same time makes each country is very sensitive to external influences. One of new features of world economy is associated with a sharply increased rate of emergence and spread of variety of crises, which is accompanied by economic and social effects for national economy. A very important point deals with relations and communication between national security and development resources providing. The nature and risks level determines the main directions of activity for their prevention and localization as well as tools and methods for solving national security problems with rational use of limited available resources.

**Analysis of recent researches and publications.** Resource management system as the base of economic growth includes the resource strategy and the system resource strategy implementation, theoretical and methodological aspects of which are actual scientific tasks.

According to [4] resource can be defined as «source or supply, from which the benefit is produced. Typically resources are materials, energy, services, staff, knowledge or other assets, that are transformed to produce benefit and in the process may be consumed or made unavailable. Benefits of resource utilization may include increased wealth, meeting needs or wants, proper functioning of system or enhanced well being». This definition gives possibility to identify the task of resource base support of any state's objective.

Porter M. formulates the basics of modern nation's development in such way: "National prosperity is

---

<sup>1</sup> The research was publicly funded by Ministry of Education and Science of Ukraine for developing of scientific research project № 53.15.01-01.15/17.3Ф "Methodology of forming mechanism of national economics innovative development based on alternative energy"

created, not inherited. It does not grow out of a country's natural endowments, its labor pool, its interest rates, or its currency's value, as classical economics insists. A nation's competitiveness depends on the capacity of its industry to innovate and upgrade" [7]. This main Porter's idea is in base of Diamond of National Advantage, each point of which affects essential factors for achieving nation's competitive success: availability of resources and skills necessary for competitive advantage; information, that support of opportunities using, that companies perceive and directions, in which they put resources and skills; goals of owners, managers and individuals; and pressures on companies to invest and innovate. So, we see, that properly resource component is only the fourth part of competitive success. Author for illustration of Diamond of National Advantage practical application also gives excellent example of Japanese statement «We are an island nation with no natural resources», which shows, that these deficiencies have only served to spur Japan's competitive innovation.

In this context talking about different resources as success factors and resource type dynamics Torvik R. [11] research question: "rather than studying the average effect of resources, recent research has turned to its variation when does resource abundance breed success and when does it breed economic failure?". Similar question can be found in World Bank research of global wealth dynamics [10], that includes conclusion, which without efficient management, even existing natural patrimony in blessed with mineral and energy resources nations, is at risk situation.

According to Urata S. [12] economic development and structural changes result from interaction of supply and demand factors. First group of factors includes the accumulation and efficient use of production factors such as labour and capital, whereas demand factors include changes in patterns of intermediate and final demand. This approach illustrates the main idea of modern economy, but requires detailed analysis of economic linkages structure.

The authors in researches [2; 5; 13] among the most important activities of national security management have considered development resources security, which includes the selection of priority activity systems (to prevent interruption of their functioning and irregularities in their functioning) those, that are resource regarding nations development process (according to the concepts and development programs). We believe, that such expansion of traditional stationary approach to resources, and considering of resources as a product of economic system allows significantly improve national security methodology.

Such understanding of resources is a key component of Europe 2020, EU's strategy for building growth and jobs, that aims to encourage economic growth, that will be smart (based on knowledge and innovation as the main resources), sustainable (green) and inclusive [9].

OECD methodology of resource analysis [1] takes into account differences and specifics in natural resource endowments, levels of socio-economic development, sources of economic growth, and institutional capacity. Within this methodology six economy policy challenges need to be addressed in context of developing national green growth strategy, in each of which governments can exercise leadership. In our study these challenges can be considered in the context of strategically management of economic systems, which requires appropriate resource support strategy, which in turn requires methodological approach.

Analysis of indicated researches and publications shows, that there is no consensus among researchers concerning the problem definition of basic mechanisms of globalization and international integration impact on national security, in particular its resource component, that generates in practice considerable difficulties in the application of management mechanisms and economic security special legislation, that will take into account resource aspect and resource security, based on the system approach.

So, **the aim of research** is to analyze the main idea and characteristics of main components of development resources security management.

As a basic **methodology of research** we propose to consider theoretical aspects of economic and

national security concepts from the point of economic systems resource support; explore the threats to national and economic security base on concept of «development resources»; explore ways to solve problems of development resources security from the point of globalization threats and opportunities. The study is based on the considering the trends of inclusion in security sphere numerous non-state agents and new factors, as well as the expansion of objective analysis of resource security field. This aspect is passed on considered earlier international innovation networks development, which provides resource coordination for some purpose (project) at the national level. The similar approach can be used for analysis of development resources security through different innovation communications, which can create new resource base element. In our previous studies [3; 6; 8] we have considered strategy efficiency in an increasingly global economy and improving of interaction mechanisms between government and private firms in the financing of new space technologies development and their next application for commercial purposes.

**Main material.** In the globalization era the state's role is changing, that leads to the change of national security specifics. In this context it should be taken into account a few key movements. Firstly, it is narrowing the states capacity to influence on global processes and changes, deter and prevent serious threats. Secondly, it is development of resource base and possibilities, which are based on properties of different resources.

Here we propose to consider the development resources definition in two dimensions: as (1) a set of economic and social resources, located in some territory (region), given the interchangeability and exchange value of the resources both within a given territory and in the external relations, as well as (2) numerous organizational and economic forms and processes of resource using, involved at present time or have potential for involving in development process in future. So, our definition of development resources includes resource definition in traditional and market sense as well as management efficiency issues.

So, each subsystem of national economy management should identify and analyze of risks of anticipated threats to resource security, identify variants of responses and implement appropriate control actions. Given analysis and preparatory work should be maintained and updated as conditions are changing. This can be done according six basic groups of development resources:

- 1) natural resources (land, minerals, fuels, climate; their quantity and quality);
- 2) human resources (labour supply and quality);
- 3) physical capital (machines, factories, roads; their quantity and quality);
- 4) technological factors, that connect other resources;
- 5) institutional factors, that include banking system, legal system, good health care etc.;
- 6) relationship capital and cooperation factors, that include process of resource interchangeability through partnerships.

We highlight institutional structures, that contribute for resource coordination goals for development objectives, and their role can be considered based on historical experience:

1. Countries with history of stable government and developed commercial sector including merchants, financiers and businesses familiar with international economic system tend to have fewer problems with development.

2. Countries with governments previously dominated by colonial powers and with commerce controlled by minorities, find it difficult to compete in international trade, financial or innovation system.

It should be noted that the number of resources in many countries is a determining factor in the choice of the main points of national development strategy, since government priorities and implementation of strategic objectives formation depends upon it. In this context, the global aspect of development resources security management derived from their limitations, that affect access to other types of resources. One billion of people lives in developed countries and controls over 80% of the world's resources. Consequently, the remaining five billion have to be satisfied for only 20% of

the world's resources. The population of the poor countries is growing much faster, than of rich countries. Over the next 25 years, mostly in the developing world it is expected to be born approximately two billion people.

All these indicated characteristics and trends find their display in resource management systems, which are reflected in particular in resource curse, paradox of plenty versus Japan success and other examples. Using proposed resources classification can reasonably analyze the safety of different types of resources, correctly determine the stages and phases of various economic entities (national or regional economy, enterprise, product etc.) cycle on which the respective resource groups should be involved. This, in turn, is one of the most important factors in establishing an effective development management system in the context of economic security. In this context ensuring of resource development security principle can be considered initially controversial management aspects – security providing and development management not only as compatible, but as mutually providing [13]. According to this principle, identification the most effective ways to generate resources for further distribution is one of the most urgent government tasks of any country. For consideration of development resources security principle, it is necessary to consider two aspects:

1. Development of any nation's dimension is activity process, which like all other activity-related processes for its implementation needs resources. Those «resource» (in relation to the development) activities system, due to which it should be done, should already to function and reproduce; therefore, it is necessary to ensure their safety to prevent processes with negative results, that impede their functioning. This principle can be displayed in resource dynamics tree (Fig. 1), which reflects the resources detailed in different stages of some objective achieving and resource dynamics in support subsystems (resource hierarchy).

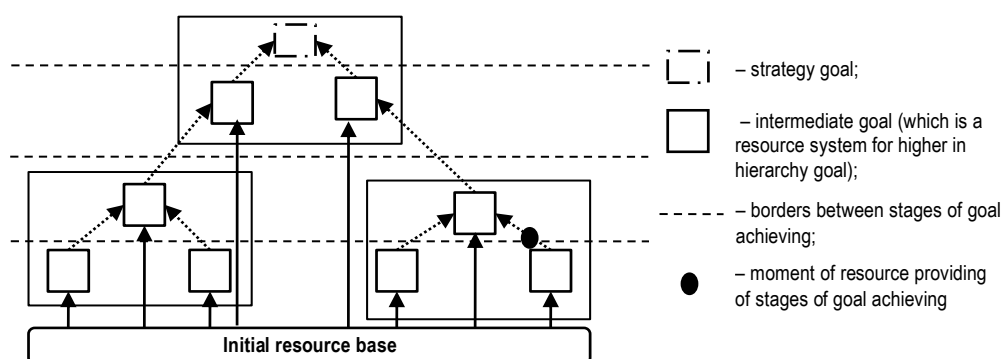


Figure 1 – Resource tree (author's development)

For example, one country may have engineers, who know, how to build nuclear power plants, but it needs financial resources to build it. Another country may have financial resources, but do not have the technical knowledge about nuclear power plants. A third may require both financial resources and expertise. Some countries may require assistance in developing a curriculum to train future engineers, who will be able to build such nuclear power plants. So, we see, that in the case of high technology industries such resource chains are much longer. In this case resource tree shows, what resources (or the outcome of resource supply subsystems) are available and what in quite problematic.

We also can conclude, that similar in formulation and meaning is the task of calculating of systems reliability, i.e. analysis of system's ability to maintain the properties required to perform a given destination. But in the case of national economy and innovation and technological systems as a national

economy foundation, we are confronted with external impulses (competitors, macroeconomic stress, etc.) that do not correspond with normal conditions and in result we need to adjust the resource matrix and complex of strategies.

So, resource security based approach significantly expands the task of factor analysis, since considers, that economic object safety should be system (integrated) and accordingly involve a number of supply subsystems (scientific, technical, information, logistics, personnel, organizational, etc.), that should function agreed through a set of different types of flows (material flow, energy flow, information flow, changing states). From this perspective, the structure of the system can be viewed as a set of restrictions on flows in space and time.

State development strategy is aimed at achieving the objectives arising from the needs of society at a certain stage of development. The main criteria for successful development strategy formation can be attributed:

- 1) socio-economic efficiency;
- 2) speed of obtaining positive (necessary) results;
- 3) minimum amount of expended resources.

Meeting these challenges of development programs at various levels is carried out through the coordinated implementation of interrelated on timing, resources and sources of their maintenance activities. Thus, each country should create its own resource system for the purpose and strategy. For this purpose one of the key tools is programs matrix, which implements the following resource management functions:

- analysis of the existing development programs effectiveness;
- analysis of available resources, requests and projects from the artists and collaborators of the national and regional development programs;
- formation of proposals for synergistic interaction of resources, requests and projects from artists and collaborators of national and regional development programs.

2. All subsystems of national security are characterized by internal contradiction: the better they work, the more effective they predict and plan the development and the more effectively prevents the negative effects, the less their necessity for resources are. If the system of national security is aimed at ensuring of development resources security, it at the same time takes care of its own future, because the development is associated with the risk, which means that it provides the national security system of constant activity processes (monitoring and prediction of new negative impulses).

Considering the second aspect we need to keep in mind, that development resources security in the context of globalization is becoming the part of global and international security. There are many problems, which threaten at the same as the national security of individual nations and the international security system. Management processes in modern conditions occur in blurring of boundaries between internal and external state policy. This encourages states to accept the new conditions and develop (correct) appropriate resource policy. If in development policy the external situation will not be considered, the efforts of national development strategies will be unsuccessful, because the increased impact of global flows and processes in financial, industrial, social, economic, political and other spheres.

On Fig. 2 based on two aspects of development resources security principle we consider: (1) understanding development as multidimensional process, influenced by national and international factors; (2) possibility of resources replacing and creation in economic system.

States are becoming more vulnerable, not only in economic terms, but also in technologies and innovation areas, that is caused by the increasing openness of societies and revolution in technology paradigm, especially information technologies development. In context of our previous studies [14; 15] we can apply the security of development resources approach for innovation system.

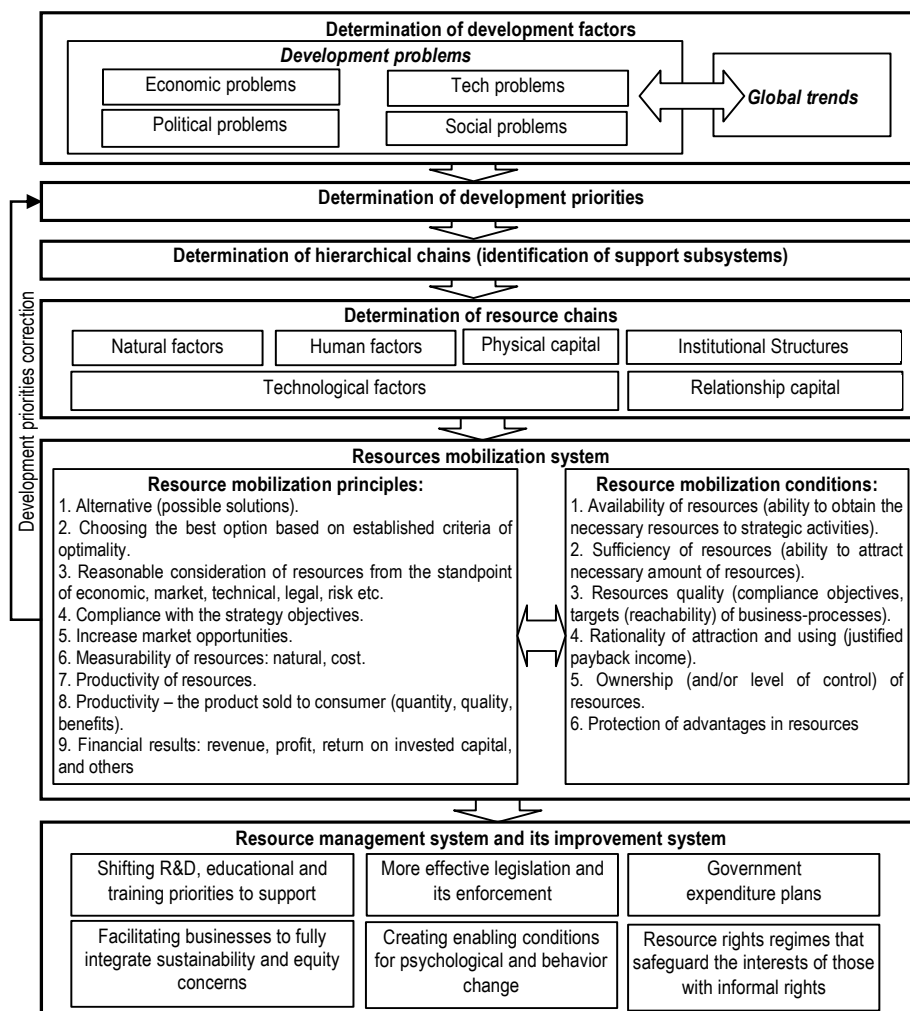


Figure 2 – Development resources security management (author's development)

Based on above for development resources security principle implementation for innovation and technological systems at the national level it is necessary to integration implementation of such measures:

1) make more flexible and efficient mechanisms of governance (especially planning and coordination), using the methods of motivation for conviction of businesses in production of innovative products and output it to the domestic and international markets, and the mechanism of economic incentives for domestic consumers of this product;

2) structure the priority areas using good governance so that enterprises, integrated structures and holdings be effectively evolved, independently operated, performing all the tasks of developing and manufacturing of high-tech products as for the state order and in the commercial segment, responding to the challenges and requirements of world market;

3) create incentives and mechanisms necessary to attract private and foreign investments in future potential market and competitive industry segments, as well as for innovation development of domestic enterprises.

**Conclusion and further research directions.** National security is exposed to new threats under the influence of globalization, and therefore approaches to its security must be changed and new strategies and concepts should be developed. Security issues, that were considered in the article, are based on understanding, that many countries for independent development does not have the resources, knowledge, highly skilled staff and funds, leading to different gaps (economic, innovation, level and quality of life) in international dimension. The resource potential is an opportunity for country in implementing its development programs and is characterized by the provision of production factors (natural resources, labor, capital assets, infrastructure, etc.). In research as part of development resources security comprehensive resource optimization structure is considered. In **further researches** it is necessary to analyze the practical aspects of development resources security concept.

1. Green Growth and Developing Countries. – OECD, 2012. – 145 p.
2. Hislop H. Reinventing the wheel: a circular economy for resource security [Electronic resource] / H. Hislop, J. Hill. – Green Alliance, 2011. – Access mode: <http://www.sita.co.uk/downloads/ReinventingTheWheel-1110-web.pdf>.
3. Krapivny I.V. International innovation networks as new stage of innovation development [Electronic resource] / I.V. Krapivny, V.A. Omelyanenko, N.O. Vernydub // Economic Processes Management. – 2015. – № 1. – Access mode: [http://epm.fem.sumdu.edu.ua/download/2015\\_1/2015\\_1\\_17.pdf](http://epm.fem.sumdu.edu.ua/download/2015_1/2015_1_17.pdf).
4. Miller G.T. Living in the Environment: Principles, Connections, and Solutions / G.T. Miller, S. Spoolman. – 17th ed. – Belmont, CA : Brooks-Cole, 2011.
5. Nanto D.K. Economics and National Security: Issues and Implications for U.S. Policy: CRS Report for Congress Prepared for Members and Committees of Congress / D.K. Nanto. – Congressional Research Service, 2011 – 82 p.
6. Omelyanenko V.A. Analysis of Potential of International Inter-Cluster Cooperation in High-Tech Industries / V.A. Omelyanenko // International Journal of Econometrics and Financial Management. – 2014. – Vol. 2, No 4. – PP. 141–147.
7. Porter M.E. The Competitive Advantage of Nations [Electronic resource] / M.E. Porter. // Harvard Business Review. – 1990. – March-April Issue. – Access mode: <https://hbr.org/1990/03/the-competitive-advantage-of-nations>.
8. Prokopenko O. Role of international factor in innovation ecosystem formation / O. Prokopenko, Yu. Eremenko, V. Omelyanenko // Economic Annals – XXI. – 2014. – No 3–4 (2). – PP. 4-7.
9. Resource efficiency – a business imperative. – European Commission, 2011.
10. The Changing Wealth of Nations Measuring Sustainable Development in the New Millennium. – World Bank, 2011. – 242 p.
11. Torvik R. Why do some resource-abundant countries succeed while others do not? / R. Torvik // Oxford Review of Economic Policy. – 2009. – Vol. 25, N. 2. – PP. 241-256.
12. Urata S. Sources of Economic Growth and Structural Change: An International Comparison / S. Urata // The Balance between Industry and Agriculture in Economic Development: Proceedings of the Eighth World Congress of the International Economic Association, Delhi, India, 1989. – PP. 144-166.
13. Кортунів С.В. Концептуальні основи національної та міжнародної безпеки / С.В. Кортунів. – М. : Государственный университет – Высшая Школа Экономики, 2007. – 307 с.
14. Омеляненко В.А. Міжнародний фактор забезпечення технологічної безпеки держави / В.А. Омеляненко, О.В. Прокопенко // Економічна безпека держави: міждисциплінарний підхід : колективна монографія / за наук. ред. д.е.н., проф. Хлобистова Є.В. – Черкаси, 2013. – С. 89–98.
15. Омеляненко В.А. Науково-методичний підхід до аналітичного забезпечення проєктів розвитку технологічних систем / В.А. Омеляненко // Управління проєктами та розвиток виробництва. – 2016. – №2(58). – С. 18-26.

1. Green Growth and Developing Countries. (2012). OECD [in English].
2. Hislop, H., & Hill, J. (2011). Reinventing the wheel: a circular economy for resource security. Green Alliance. [www.sita.co.uk](http://www.sita.co.uk). Retrieved from <http://www.sita.co.uk/downloads/ReinventingTheWheel-1110-web.pdf> [in English].
3. Krapivny, I.V., Omelyanenko, V.A., & Vernydub, N.O. (2015). International innovation networks as new stage of innovation development. *Economic Processes Management*, 1. Retrieved from [http://epm.fem.sumdu.edu.ua/download/2015\\_1/2015\\_1\\_17.pdf](http://epm.fem.sumdu.edu.ua/download/2015_1/2015_1_17.pdf) [in English].
4. Miller, G.T., & Spoolman, S. (2011). *Living in the Environment: Principles, Connections, and Solutions*. (17th ed.). Belmont, CA: Brooks-Cole [in English].
5. Nanto, D.K. (2011). *Economics and National Security: Issues and Implications for U.S. Policy: CRS Report for Congress Prepared for Members and Committees of Congress*. Congressional Research Service [in English].

#### Розділ 4 Проблеми управління інноваційним розвитком

6. Omelyanenko, V.A. (2014). Analysis of Potential of International Inter-Cluster Cooperation in High-Tech Industries. *International Journal of Econometrics and Financial Management*, Vol. 2, 4, 141-147 [in English].
7. Porter, M.E. (1990). The Competitive Advantage of Nations, *Harvard Business Review*. March-April Issue. Retrieved from <https://hbr.org/1990/03/the-competitive-advantage-of-nations> [in English].
8. Prokopenko, O., Eremenko, Yu., & Omelyanenko, V. (2014). Role of international factor in innovation ecosystem formation. *Economic Annals – XXI*, 3-4 (2), 4-7 [in English].
9. Resource efficiency – a business imperative. (2011). *European Commission* [in English].
10. The Changing Wealth of Nations Measuring Sustainable Development in New Millennium. (2011). *World Bank* [in English].
11. Torvik, R. (2009). Why do some resource-abundant countries succeed while others do not? *Oxford Review of Economic Policy*, Vol. 25, 2, 241-256 [in English].
12. Urata, S. (1989). Sources of Economic Growth and Structural Change: An International Comparison. *The Balance between Industry and Agriculture in Economic Development: Proceedings of the Eighth World Congress of the International Economic Association*. (pp. 144–166). Delhi, India [in English].
13. Kortunov, S.V. (2007). *Konceptualnyie osnovy natsionalnoi i mezhdunarodnoi bezopasnosti [Conceptual bases of national and international security]*. Moscow. National University – Higher School of Economics [in Russian].
14. Omelyanenko, V.A., & Prokopenko, O.V. (2013). Mizhnarodnyi faktor zabezpechennia tehnologichnoi bezpeki derzhavi [International factor of state technological security]. *Ekonomichna bezpeka derzhavy: mizhdyscyplinarny pidhid – Economic security of the state: an interdisciplinary approach*. (pp. 89-98). Cherkasy [in Ukrainian].
15. Omelyanenko, V.A. (2016). Naukovo-metodichnyi pidhid do analitichnogo zabezpechennia proektiv rozvitku tehnologichnih sistem [Scientific and methodical approach to analytical support of technological systems development projects]. *Upravlinnia proektamy ta rozvytok vyrobnyctva – Project management and development of production*, 2(58), 18-26 [in Ukrainian].

**В.А. Омеляненко**, канд. екон. наук, асистент кафедри економічної теорії, м.н.с., Сумський державний університет (м. Суми, Україна);

**О.Ю. Кудріна**, д-р екон. наук, доцент, офіційний представник, Центр дослідження європейських реформ (м. Люксембург, Велике Герцогство Люксембург); завідувач кафедри економіки та бізнесу, Сумський державний педагогічний університет ім. А.С.Макаренка (м. Суми, Україна);

**Д.В. Володін**, PhD, менеджер проектів, FARADI SRL (м. Турин, Італія)

##### **Концептуальні засади аналізу безпеки ресурсів розвитку**

У статті розглядається проблема безпеки ресурсів розвитку, що є частиною економічної безпеки та управління розвитком. Загальний зміст концепції безпеки ресурсів розвитку розглядається на основі аналізу множини економічних і соціальних ресурсів, а також численних організаційно-економічних форм і процесів використання ресурсів. На основі цього запропоновано класифікацію ресурсів розвитку. Для поліпшення рівня безпеки ми пропонуємо використати дерева динаміки ресурсів, що враховують етапи досягнення мети з аналізом наявних ресурсів, а також матрицю програм, що показує взаємозв'язок між різними програмами розвитку, включаючи ієрархію та компонент ресурсів.

Ключові слова: безпека ресурсів розвитку, стратегія, ресурси, глобалізація, економічна безпека, керування, економічна система.

**В.А. Омеляненко**, канд. екон. наук, асистент кафедри економічної теорії, м.н.с., Сумський державний університет (м. Суми, Україна);

**О.Ю. Кудріна**, д-р екон. наук, доцент, офіційний представник, Центр дослідження європейських реформ (м. Люксембург, Велике Герцогство Люксембург); завідувач кафедри економіки та бізнесу, Сумський державний педагогічний університет ім. А.С.Макаренка (м. Суми, Україна);

**Д.В. Володін**, PhD, менеджер проектів, FARADI SRL, (м. Турин, Італія)

##### **Концептуальные основы анализа безопасности ресурсов развития**

В статье рассматривается проблема безопасности ресурсов развития, что является частью экономической безопасности и управления развитием. Общий смысл концепции безопасности ресурсов развития рассматривается на основе анализа множества экономических и социальных ресурсов, а также многочисленных организационно-экономических форм и процессов использования ресурсов. На основе этого предложено классификацию ресурсов развития. Для улучшения уровня безопасности мы предлагаем использовать деревья динамики ресурсов, что учитывают этапы достижения цели с анализом имеющихся ресурсов, а также матрицу программ, которая показывает взаимосвязь между различными программами развития, включая иерархию и компонент ресурсов.

Ключевые слова: безопасность ресурсов развития, стратегия, ресурсы, глобализация, экономическая безопасность, управление, экономическая система.

Отримано 25.10.2016 р.