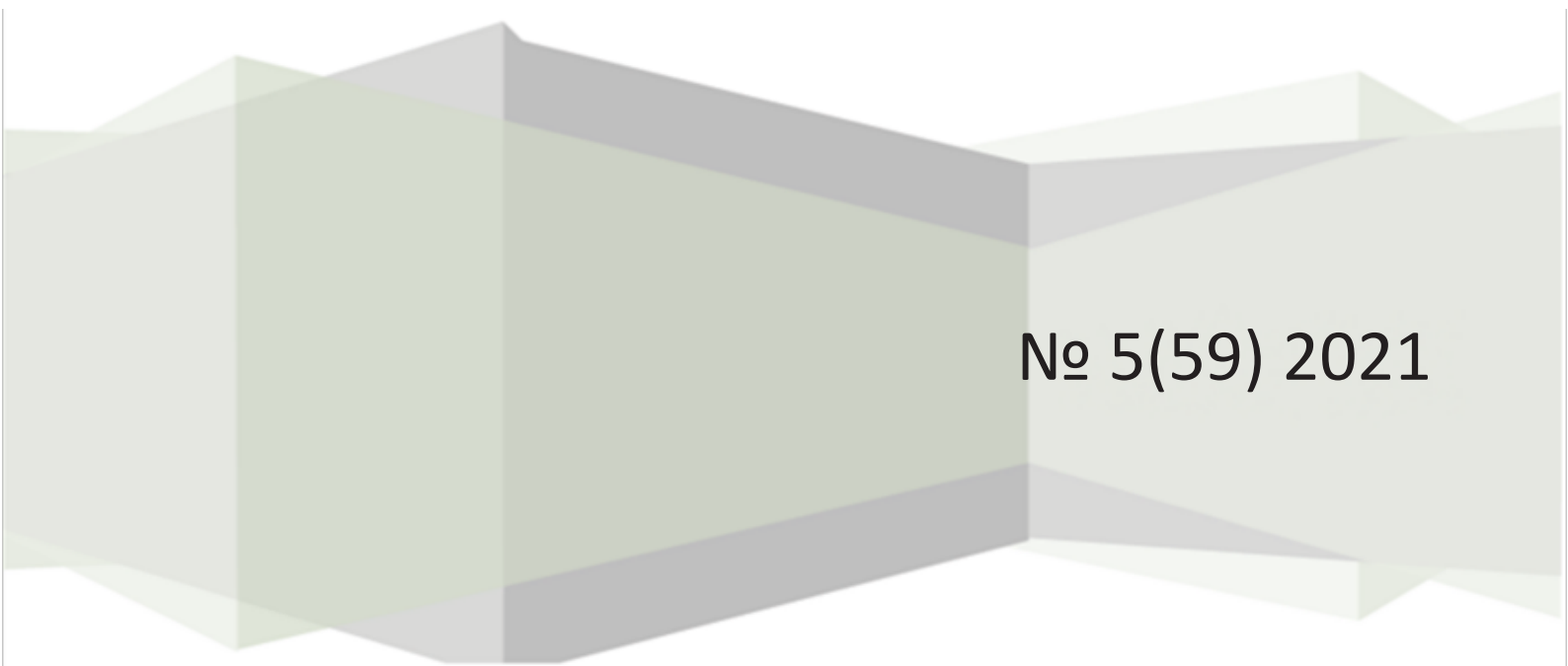


ISSN 1997-9347

# Components of Scientific and Technological Progress

*SCIENTIFIC AND PRACTICAL JOURNAL*



No 5(59) 2021

Paphos, Cyprus, 2021

Journal "Components  
of Scientific and Technological  
Progress"  
is published 12 times a year

**Founder**  
Development Fund for Science  
and Culture  
Scientific news of Cyprus LTD

The journal "Components of Scientific  
and Technological Progress" is included  
in the list of HAC leading peer-reviewed  
scientific journals and publications  
in which the main scientific results  
of the dissertation for the degree  
of doctor and candidate of sciences  
should be published

**Chief editor**  
Vyacheslav Tyutyunnik

**Page planner:**  
Marina Karina

**Copy editor:**  
Natalia Gunina

**Director of public relations:**  
Ellada Karakasidou

**Postal address:**  
**1. In Cyprus:**  
8046 Atalanta court, 302  
Paphos, Cyprus  
**2. In Russia:**  
13 Shpalernaya St,  
St. Petersburg, Russia

**Contact phone:**  
(+357)99-740-463  
8(915)678-88-44

**E-mail:**  
tmbprint@mail.ru

Subscription index of Agency  
"Rospechat" No 70728  
for periodicals.

Information about published  
articles is regularly provided to  
**Russian Science Citation Index**  
(Contract No 124-04/2011R).

**Website:**  
<http://moofrnk.com/>

Editorial opinion may be different  
from the views of the authors.  
Please, request the editors'  
permission to reproduce  
the content published in the journal.

## ADVISORY COUNCIL

**Tyutyunnik Vyacheslav Mikhailovich** – Doctor of Technical  
Sciences, Candidate of Chemical Sciences, Professor, Director of  
Tambov branch of Moscow State University of Culture and Arts,  
President of the International Information Center for Nobel Prize,  
Academy of Natural Sciences, tel.: 8(4752)504600,  
E-mail: vmt@tmb.ru, Tambov (Russia)

**Bednarzhevsky Sergey Stanislavovich** – Doctor of Technical  
Sciences, Professor, Head of Department of Safety, Surgut State  
University, laureate of State Prize in Science and Technology,  
Academy of Natural Sciences and the International Energy Academy,  
tel.: 8(3462)762812, E-mail: sbed@mail.ru, Russia

**Voronkova Olga Vasilyevna** – Doctor of Economics, Professor,  
Academy of the Academy of Natural Sciences, tel.: 8(981)9720993,  
E-mail: voronkova@tambov-konfcentr.ru, St. Petersburg (Russia)

**Omar Larouk** – PhD, Associate Professor, National School  
of Information Science and Libraries University of Lyon,  
tel.: +0472444374, E-mail: omar.larouk@enssib.fr, Lyon (France)

**Wu Songjie** – PhD in Economics, Shandong Normal University,  
tel.: +86(130)21696101; E-mail: qdwucong@hotmail.com,  
Shandong (China)

**Du Kun** – PhD in Economics, Associate Professor, Department of  
Management and Agriculture, Institute of Cooperation of Qingdao  
Agrarian University, tel.: 8(960)6671587,  
E-mail: tambovdu@hotmail.com, Qingdao (China)

**Andreas Kyriakos Georgiou** – Lecturer in Accounting, Department of  
Business, Accounting & Finance, Frederick University,  
tel.: (00357) 99459477 E-mail: bus.akg@frederick.ac.cy, Limassol  
(Cyprus)

**Petia Tanova** – Associate Professor in Economics, Vice-Dean of  
School of Business and Law, Frederick University,  
tel.: (00357)96490221, E-mail: ptanova@gmail.com, Limassol  
(Cyprus)

**Sanjay Yadav** – Doctor of Philology, Doctor of Political Sciences,  
Head of Department of English, Chairman St. Palus College Science,  
tel.: 8(964)1304135, Patna, Bihar (India)

**Levanova Elena Alexandrovna** – Doctor of Education, Professor,  
Department of Social Pedagogy and Psychology, Dean of the Faculty  
of retraining for Applied Psychology, Dean of the Faculty of Pedagogy

and Psychology of the Moscow Social and Pedagogical Institute; tel.: 8(495)6074186, 8(495)6074513; E-mail: dekanmospi@mail.ru, Moscow (Russia)

**Petrenko Sergey Vladimirovich** – Doctor of Technical Sciences, Professor, Head of Department of Mathematical Methods in Economics, Lipetsk State Pedagogical University, tel.: 8(4742)328436, 8(4742)221983, E-mail: viola@lipetsk.ru, viola349650@yandex.ru, Lipetsk (Russia)

**Tarando Elena Evgenievna** – Doctor of Economics, Professor of the Department of Economic Sociology, St. Petersburg State University, tel.: 8(812)2749706, E-mail: elena.tarando@mail.ru, St. Petersburg (Russia)

**Veress József** – PhD, Researcher in Information Systems Department, Business School of Corvinus University, tel.: 36 303206350, 36 1 482 742; E-mail: jozsef.veress@uni-corvinus.hu, Budapest (Hungary)

**Kochetkova Alexandra Igorevna** – Doctor of Philosophy and Cultural Studies (degree in organizational development and organizational behavior), PhD, Professor, Department of General and Strategic Management Institute of Business Administration of the Russian Academy of National Economy and Public Administration under the President of the Russian Federation, E-mail: dak6966@gmail.com, Moscow (Russia)

**Bolshakov Sergey Nikolaevich** – Doctor of Political Sciences, Doctor of Economics, Vice-Rector for Academic Affairs, Professor, Syktyvkar State University named after Pitirim Sorokin, tel.: 8(921)6334832, E-mail: snbolshakov@mail.ru, Syktyvkar (Russia)

**Gocłowska-Bolek Joanna** – Center for Political Analysis, University of Warsaw, tel. 48691445777, E-mail: j.gocłowska-bolek@uw.edu.pl, Warsaw (Poland)

**Karakasidou Ellada** – A&G, Kotanides LTD, Logistic, tel.: +99346270, E-mail: espavoellada9@gmail.com, Paphos (Cyprus)

**Artyukh Angelika Alexandrovna** – Doctor of Art History, Professor of the Department of Dramatic and Cinema Studies, St. Petersburg State University of Cinema and Television; tel.: +7(911)9250031; E-mail: s-melnikova@list.ru, St. Petersburg (Russia)

**Melnikova Svetlana Ivanovna** – Doctor of Art History, Professor, Head of the Department of Dramatic Art and Cinema Studies at the Screen Arts Institute of St. Petersburg State University of Cinema and Television; tel.: +7(911)9250031; E-mail: s-melnikova@list.ru, St. Petersburg (Russia)

**Marijan Cingula** – Tenured Professor, University of Zagreb, Faculty of Economics and Business, tel.: +385(95)1998925, E-mail: mcingula@efzg.hr, Zagreb (Croatia)

**Pukharenko Yury Vladimirovich** – Doctor of Technical Sciences, Professor, Head of the Department of Building Materials Technology and Metrology at St. Petersburg State University of Architecture and Civil Engineering, Corresponding Member of the Russian Academy of Architecture and Construction Sciences; tel.: +7(921)3245908; E-mail: tsik@spbgasu.ru, St. Petersburg (Russia)

**Przygoda Mirosław** – Dr. hab., Head of Institute of Economic Analysis and Planning, Department of Management, University of Warsaw, tel.: 225534167, E-mail: mirosławprzygoda@wp.pl, Warsaw (Poland)

**Recker Nicholas** – PhD, Associate Professor, Metropolitan State University of Denver, tel.: 3035563167, E-mail: nrecker@msudenver.edu, Denver (USA)

## Contents

### *Engineering*

- Sukhanov Yu.V., Tsarev T.A., Vasilyev A.S., Ivashnev M.V.** A Laboratory Setup for Demonstration and Study of the Process of Cutting Anisotropic Materials ..... 5

### *Economic Sciences*

- Gribanovskaia S.V., Panova A.Yu., Voronkova O.V.** Possibilities of Applying an Adaptation Strategy to Natural Risks..... 8
- Semenova Yu.E., Ostrovskaya E.N., Panova A.Yu.** Economic Security and Problems of Labor Migration ..... 12
- Shlafman A.I.** Management and Infrastructure of Promising International Projects in the Arctic Zone of the Russian Federation..... 16

### *Architecture and Construction*

- Zhuykov S.V.** Methods of Architectural Planning for the Development of Urban Areas.. 20

## Содержание

### *Машиностроение*

- Суханов Ю.В., Царев Т.А., Васильев А.С., Ивашнев М.В.** Лабораторная установка для демонстрации и изучения процесса резания анизотропных материалов..... 5

### *Экономические науки*

- Грибановская С.В., Панова А.Ю., Воронкова О.В.** Возможности применения стратегии адаптации к природным рискам ..... 8
- Семенова Ю.Е., Островская Е.Н., Панова А.Ю.** Экономическая безопасность и проблемы трудовой миграции ..... 12
- Шлафман А.И.** Управление и инфраструктура реализации перспективных международных проектов в Арктической зоне РФ ..... 16

### *Архитектура и строительство*

- Жуйков С.В.** Методика архитектурного планирования для развития городских территорий..... 20

UDK 621.9.06

## A Laboratory Setup for Demonstration and Study of the Process of Cutting Anisotropic Materials

Yu.V. Sukhanov, T.A. Tsarev, A.S. Vasilev, M.V. Ivashnev

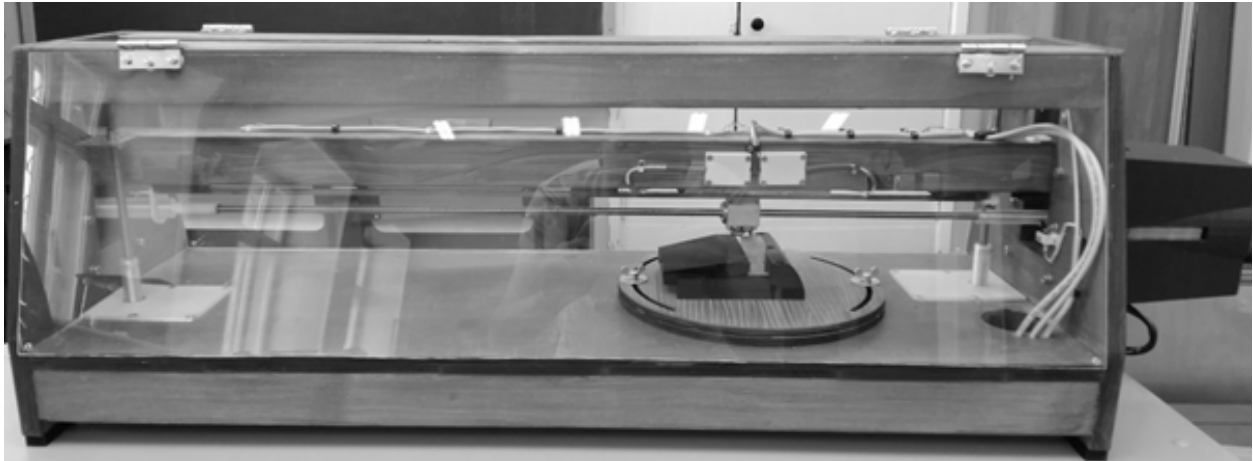
*Petrozavodsk State University,  
Petrozavodsk (Russia)*

**Key words and phrases:** anisotropic material; cutting; laboratory setup.

**Abstract.** The study aims to create a prototype of a laboratory setup to demonstrate the cutting process to students and conduct laboratory work to study the parameters of the impact of the cutting working body on the workpiece. To achieve this goal, the following tasks were solved: the existing designs of laboratory setups for a similar purpose were studied and analyzed; an original design of the installation is proposed. As a result of the study, a prototype of the setup was created, software was written to control its operation.

Laboratory equipment can be divided into several types by purpose. The first type is equipment designed to demonstrate the studied physical processes. Such equipment is required to provide the ability to visually observe the ongoing processes – this allows students to better understand the principles of equipment operation and the essence of the studied processes. The second type is equipment designed for research work. This type of equipment is required to provide the ability not only to monitor the current process parameters and their statement, but also to control the input process parameters. For example, the cutting forces during mechanical processing of wood depend on the direction in which the process is going relative to the wood fibers, on the type of wood and its moisture content, on the geometry of the cutter and its condition, as well as on the assigned cutting modes. The cleanliness of the cut also depends on the cutting conditions and the geometry and position of the cutter. The second type of laboratory equipment will allow, when the input parameters are changed, to track the corresponding change in the values of the output parameters. The third type is combined equipment that combines the advantages of the first two types, namely the ability to visually observe the ongoing process, set different values of the input parameters and fix the values of the output parameters. At the same time, the more set and controlled parameters, the wider the capabilities of the equipment, but this leads to an increase in its complexity, cost and energy consumption in operation.

In the course of the conducted information search, a description of several designs of setups for the cutting process was found. But they all have a significant drawback, which is that the cutting body is fixed motionless in them, and the workpiece itself is the moving link. This design makes it possible to simplify the design and provide a simpler reading of data characterizing the cutting conditions. But at the same time, the clarity of the process disappears, since in



**Fig. 1.** Laboratory setup prototype

the overwhelming majority of cutting machines, the moving link is the cutting body, and the workpiece is motionlessly fixed on the bed. In addition, the movement of the workpiece, which is typical for existing structures, requires increased energy costs, because the workpiece has a much larger size and weight than the cutting body.

In order to increase the interest of students in the educational process and increase the level of assimilation of the studied material, a prototype of the stand design was developed to study the modes and parameters of the cutting process of anisotropic materials (Fig. 1).

A feature of the developed design is that the moving link is the cutting body. In this design, the workpiece is fixed immovably to a rotary table mounted on the machine frame. Due to the fact that the table is rotary, it is possible to install standard samples at various angles to the trajectory of the cutting body. This makes it possible to study the cutting forces of anisotropic materials at different cutting directions relative to the fibers.

The removable cutter is mounted on a movable carriage. Saw teeth of various geometries can be used as a cutting body. In this case, the movable carriage is installed on a guide that has the ability to change the vertical position relative to the workpiece. As a result, it is possible to adjust the cutting depth. Due to the fact that in this design, the moving link is not the workpiece, but the cutting body, the visibility of the cutting process is provided, in addition, this contributes to an increase in the energy efficiency of the setup by reducing the mass of the moving elements.

From the point of view of functionality, this setup is not inferior to analogs, it allows you to determine the cutting forces, record the energy expended on the cutting process, record the effect of the cutting body on the workpiece and save it to a file.

To control the operation of the setup, a special program was written that provides: first, setting in motion the actuators that ensure the specified positioning of the cutting body relative to the workpiece and the cutting process itself; secondly, collection of data on cutting forces from strain gauges and visualization of this data on a monitor, as well as writing data to a file on a hard disk; thirdly, launching an external program for recording a video stream from a video camera.

Currently, there is a tendency towards a transition to virtual laboratories in the educational process [1]. The use of the specified software will allow using this setup not only in person, but also to demonstrate its operation in virtual laboratories.

With regard to a number of solutions used in this setup, patents for industrial designs have

been obtained, in particular RU 124423 “Block diagram of an experimental setup for determining cutting conditions”, RU 124478 “Setup for determining cutting conditions”.

### References

1. Prokopcev, V.O. Virtual'nye laboratorii v obrazovatel'nom processe / V.O. Prokopcev, N.V. Prokopceva // Perspektivy nauki. – Tambov : TMBprint. – 2019. – № 12(123). – S. 283–286.

---

### Лабораторная установка для демонстрации и изучения процесса резания анизотропных материалов

Ю.В. Суханов, Т.А. Царев, А.С. Васильев, М.В. Ивашнев

*ФГБОУ ВО «Петрозаводский государственный университет»,  
г. Петрозаводск (Россия)*

**Ключевые слова и фразы:** анизотропный материал; лабораторная установка; резание.

**Аннотация.** Цель – создание прототипа лабораторной установки для демонстрации процесса резания студентам и проведения лабораторных работ по изучению параметров воздействия режущего рабочего органа на заготовку. Для достижения поставленной цели были решены следующие задачи: изучены и проанализированы существующие конструкции лабораторных установок аналогичного назначения; предложена оригинальная конструкция установки. В результате работы был создан прототип установки, написано программное обеспечение для управления ее работой.

---

© Yu.V. Sukhanov, T.A. Tsarev, A.S. Vasilyev, M.V. Ivashnev, 2021

UDK 332.1

## Possibilities of Applying an Adaptation Strategy to Natural Risks

S.V. Gribanovskaia, A.Yu. Panova, O.V. Voronkova

*St. Petersburg State University of Economics,  
St. Petersburg (Russia)*

**Key words and phrases:** adaptation strategy; natural disasters; natural disaster mitigation concept; natural risks; socio-economic damage; weather and climatic conditions.

**Abstract.** The purpose of this article is to study the socio-economic damage caused by the natural forces phenomenon as factors of natural risk. Out of the entire set of emergencies, only those were taken into account that occurred due to meteorological, hydrological and seismic reasons. The objectives are substantiation of the possibility of applying the adaptation strategy and the concept of reducing the consequences of natural disasters. The following methods of analysis were used: description, correlation and statistical methods. The findings are as follows: adaptation and reduction of socio-economic damage is possible if the adaptation mechanisms are supplemented by mitigation measures.

The conditions of human life, the direction and level of development of the economy depend on weather and climatic conditions as natural resources. The entire social and economic sphere is under constant influence of the atmosphere and climate, which is reflected, among others, in the existence of the risk of economic and social damage (losses) caused by the appearance of the elemental forces of nature [1]. It is impossible to avoid natural risk as it is an integral part of the external environment. However, there is a task to minimize the consequences of risk, namely, socio-economic damage.

If we take into account that socio-economic damage is adverse economic, demographic (social) consequences from external conditions, including weather and climatic conditions, expressed as a percentage of the value of the property in question or expressed in monetary terms. The losses of the world economy from the adverse nature and climate effects in recent years can be represented in the following tabular form (Table 1).

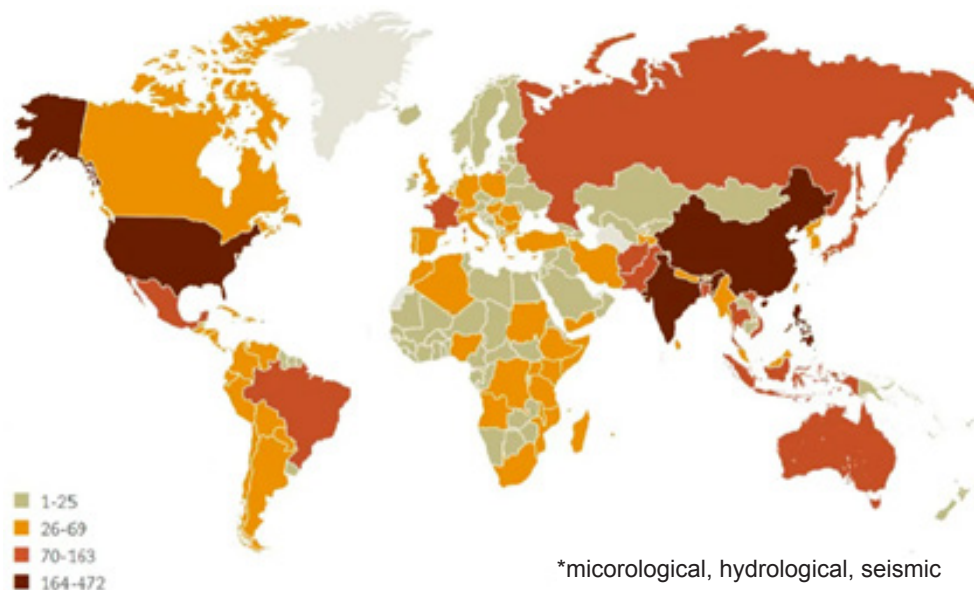
Over the past 20 years, the number of reported disasters has nearly tripled, in part due to climate change. The World Meteorological Organization notes in its report that only in 2018, storms, floods, droughts and wildfires forced 108 million people to seek help from the international humanitarian system. According to their estimations, this number could increase by almost 50 % by 2030.

At the same time, the manifestation of unfavorable weather and climatic conditions is not the same in all regions of the planet. As can be noted, there are regions more often than



**Table 1.** Loss of the global economy because of the impact of natural disasters from 2000 to 2020

Period	2000–2005	2005–2010	2010–2015	2015–2020
Number of natural disasters	995	1583	1983	2787
Damage from natural disasters, billion \$	614	721	805	887



**Fig. 1.** Number of natural disasters\* 2000–2020

others experience natural disasters, and as a result, foot the bill of great loses. Therefore, some countries have to either relocate potentially vulnerable production to potentially more stable regions or look for opportunities to minimize risks.

We divide the risks direct damage from emergencies caused by the elemental forces of nature and climate into economic and social, and in each type we will single out the elements.

At the macro level, these elements include:

1) the costs of the elimination of an emergency situation (rescue operations, medicines, equipment, salaries of rescuers, medical workers, firefighters and other participants in the elimination of an emergency);

2) the costs of eliminating the consequences of an emergency (compensation payments, restoration of state-owned enterprises and infrastructure, subsidies to affected firms, payment of benefits to persons who have become disabled as a result of an emergency, orphans, etc.).

However, one cannot ignore the indirect losses from natural disasters. These include:

1) expenses for social security, maintenance and upkeep of persons affected by natural disasters;

2) decrease in the financial results of enterprises, to one degree or another, affected by the impact of the emergency and, as a consequence, a decrease in financial flows that form budgets of various levels.

In fact, the sum of all the listed costs leads us to the concept of socio-economic damage. The scale and duration of the impact of unfavorable weather and climatic conditions largely determines the amount of socio-economic damage both for the region and for the world economy as a whole.

In conditions of constant contact with natural risk factors, there are two ways to solve the problem of minimizing socio-economic damage: create a strategy to adapt the economy to weather and climatic conditions and use the concept of mitigating the consequences of natural disasters.

The adaptation strategy presupposes the modernization of production in the economy sectors, depending on the degree of influence of climate change and adverse nature force. Here, modernization can be taken as the development and implementation of production automation and the use of remote technologies for organizing and managing production processes and lines. So that, the adaptation process includes two components:

- availability of complete and up-to-date information on the state of the environment, including forecast of climate change and hydrological, meteorological, seismic forecasts;
- availability of technologies to protect against specific adverse weather conditions, ensuring maximum efficiency at the lowest cost.

Implementation of an adaptation strategy significantly reduces losses due to meteorological reasons, reducing the share of potentially avoidable losses in them. We complement adaptation with measures to reduce losses and damage caused by natural disasters, which include:

- environmental monitoring and forecasting of natural disasters;
- preparation for emergency response;
- preparation of economic facilities and life support systems of the population for work in adverse weather and climatic conditions;
- implementation of measures to protect the population;
- localization of zones of influence of damaging factors of emergency sources, etc.

The implementation of the listed activities is carried out by planning and implementing appropriate activities for specific cases of nature disasters. The adaptation strategy, together with the concept of mitigating the consequences of natural disasters, will be based on the analysis of the risk of a dangerous weather phenomenon within the country, quick access to global warning systems through the local systems and the creation of an integrated system for monitoring the environment, the mobility of economic elements and the economy as a whole.

### References

1. Federal'nyj zakon № 68 "O zashchite naseleniya i territorii ot CHS prirodnogo i tekhnogennogo haraktera" ot 21 dekabrya 1994 g. (red. 21. 07.2014 g.).
2. Kurochkina, A.A. Ekologo-ekonomicheskie osnovy ustojchivogo razvitiya territorij / otv. red. A.A. Kurochkina. – SPb. : RGGMU, 2019. – 165 s.
3. Voronkova, O.V. Ekonomicheskie posledstviya izmeneniya klimata v Arktike / O.V. Voronkova, YU.E. Semenova, T.V. Bikezina // Nauka i biznes: puti razvitiya. – M. : TMBprint. – 2019. – № 2(92). – S. 206–210.

**Возможности применения стратегии адаптации к природным рискам**

С.В. Грибановская, А.Ю. Панова, О.В. Воронкова

*ФГБОУ ВО «Российский государственный гидрометеорологический университет»,  
г. Санкт-Петербург (Россия)*

**Ключевые слова и фразы:** концепция по смягчению последствий стихийных бедствий; погодно-климатические условия; природные риски; социально-экономический ущерб; стихийные бедствия; стратегия адаптации.

**Аннотация.** Целью написания статьи является изучение социально-экономического ущерба, вызванного проявлением стихийных сил природы как факторов природного риска. Из всей совокупности чрезвычайных ситуаций, таким образом, были рассмотрены только те, что возникли по метеорологическим, гидрологическим и сейсмическим причинам. Задачи: обоснование возможности применения стратегии адаптации и концепции снижения последствий к природным катаклизмам. В работе использованы следующие методы анализа: описание, корреляционный и статистический методы. В качестве результатов можно указать следующее: адаптация и снижение социально-экономического ущерба возможно при условии дополнения механизмов адаптации мерами по смягчению последствий.

---

© S.V. Gribanovskaia, A.Yu. Panova, O.V. Voronkova, 2021

UDK 338.14

## Economic Security and Problems of Labor Migration

Yu.E. Semenova, E.N. Ostrovskaya, A.Yu. Panova

*Russian State Hydrometeorological University,  
St. Petersburg (Russia)*

**Key words and phrases:** transformation of the labor market; technological unemployment; labor migration; the main trends in the development of the labor market; economic security.

**Abstract.** The article deals with the problems of labor migration and its impact on the economic security of the regions and the country as a whole. The purpose of this study was to identify negative trends associated with labor migration and the impact of this phenomenon on the economy. The hypothesis of the study is based on the assumption that labor migration can create a number of systemic problems for both employers and employees living in the acceptor regions, as well as lead to negative transformations of the labor market. The main research methods in the article are the analysis of scientific literature and methods of system analysis. Based on the results of the study, the authors concluded that there are currently a number of objective threats associated with labor migration and considered measures to minimize them.

In recent years, in Russia, it has become difficult to find a job is even in large cities, such as Moscow, St. Petersburg, Yekaterinburg, not only for people over 40, but also for those over 30. There is a negative, progressive trend that delays the search for work, sometimes for several years. This article is about the main problems associated with the influx of labor migrants to major Russian cities, which exacerbates the already difficult situation in the labor market. Is it possible to change the situation for the better, to enable people to use their professional skills and knowledge in the places of their birth in their small homeland?

Living in a big city is considered prestigious and comfortable, and it is always nice to show off your achievements in conquering the capital to your relatives from the regions. As one of the heroines of the cult Soviet film said: "Moscow is a big lottery", the city of opportunities and dreams. However, most of those who move to the capital do not even know what, in fact, awaits them in the vast multi-million megalopolis. The belief in a better and undoubtedly richer, more successful life in the city removes all the limiting reasonable obstacles. You need to develop new skills and qualities, accept the principles, even if they are unusual and unpleasant for you, in order to get a prestigious job and build a successful career. Most people perceive this as a trifle, because all means are good for achieving "big" goals. The city changes the "structure" of a person's worldview, but changes in the person himself are half the trouble. Not only has the

person suffered from such decisions, but also the place where he was historically formed and grew up [1]. Migration must be seen as an illusion of improving one's existence.

In the Soviet period, taking care of the native land was of paramount importance. People went to the city to study, acquire professions in demand in the regions, and most of them returned to their historical homeland to work there and improve their native lands. Now it simply doesn't exist anymore. The majority of Russians have long been not interested in the future of the region from which they left, and, therefore, the country as a whole. Everyone is interested in their own, carefree and secure future. In any metropolis, there are a certain number of enterprises. Given the economic situation, more companies are being closed than new ones are being created. These companies have a certain number of vacancies, the number of which can only increase if the business grows, which is not quite realistic in the current conditions. Therefore, it is extremely difficult to get such a job. And the more people come, the higher the competition for one job. What is the risk for employees?

First, the requirements for candidates are being tightened, and new competencies for certain positions are being introduced. Secondly, wages are reduced, if there are many applicants for one place, then someone will agree to bonded working conditions in any case. Third, employers tend to "forget" about social obligations to employees, hence the gray and black salaries, and as a result, the lack of deductions and, accordingly, revenues to the budget and pension fund. The motives that push people to move due to the lack of vacancies in the field in order to find employment in another city are quite understandable [3, p. 18]. There are no jobs for people who were born and raised in the same megalopolis due to a mass migration of people from other towns and cities. This is an important issue that the State does not pay due attention to. There are two types of migration – regional labor migration and emigration to Russia of people from the CIS countries.

Driving away from Moscow for 200–300 km, you will see the landscapes of the dying outback. Abandoned houses, farms and fields are no longer something surprising. Regional life is in decline and probably in a few years there will be nothing left but cities and urban residents. Urbanization is taking its toll. Who will feed these cities? Will animal products themselves "appear" on the shelves of chain and regular stores? We have reached an impasse with the planned course on food. Instead of developing our own livestock and crop production and thereby providing jobs, we buy products of dubious quality at exorbitant prices abroad.

Many articles have been written about the need for engineers, locksmiths and specialists in other working professions [2, p. 33]. If you do not return the prestige of these professions, then soon there will be problems with the remaining few industrial facilities. Meanwhile, there are many people in Russia who can work in manufacturing industries. In the Soviet Union, working professions were well paid. Often, the salary of a truck driver was equal to the salary of a minister. But in our time, it is possible to pay decent salaries to workers only if there is a production facility where such workers will be in demand. In essence, nothing prevents the state from creating such production facilities and jobs, developing industry in Russia. We are sure that people will be ready to move to other regions, even from megacities, if the state and commerce are able to offer favorable financial conditions.

There is also a persistent trend of emigration to Russia of people from the CIS countries. People come, they are given a residence permit, then citizenship, but what to do with them, it seems, no one in the government knows. Most expats do not take into account that the competition when looking for work in large cities is several times higher. While the existing skills and knowledge are sufficient in the provinces, in Moscow or St. Petersburg there is a demand for skilled professionals. Of course, among the emigrants there are many excellent specialists with the necessary skills and experience, but it is quite possible that they will be hired by the

same “early wave” emigrants who have already adapted to the metropolis and are not eager to hire such excellent personnel, so as not to compete with themselves.

Another serious problem associated with the employment of emigrants is the lack of assets in Russia for most of them. Many of them leave their countries in a hurry, and there is simply no information about them from the law enforcement agencies of the countries from which they came. In case of problems with the goods or money entrusted to him, there is a real danger of their loss without a trace. Employers usually take expats to low-paying jobs, often without observing any social guarantees and without entering into long-term contracts.

Most importantly, the metropolis is no longer able to provide work for such a huge influx of workers. All this serves as prerequisites for the development and adoption at the state level of constructive regulatory decisions that ensure an even distribution of working resources throughout the territory of the Russian Federation. It is necessary, first of all, to return the quotas of regional working personnel for megacities, as it was once in the Soviet Union. This solution allows you to organize the regulation of work flows, based on the needs for a specific period of time in specific regions, and to ensure their uniform distribution across the territory of the Russian Federation, both in the case of migration and emigration. When allocating quotas, it is necessary to employ migrants in large megacities, and second, emigrants. In any case, it is necessary to employ all comers throughout the Russian Federation. You need to create jobs. To achieve this goal, it is necessary to create conditions for entrepreneurs with state support, who will be ready to take over the organization of production and the implementation of programs for the revival of agriculture.

### References

1. Milyaev, M. Urbanizaciya Rossii: pochemu rynek truda degradiruet? / M. Milyaev [Electronic resource]. – Access mode : <https://www.e-xecutive.ru/career/hr-indicators/1990939-urbanizatsiya-rossii-pochemu-rynok-truda-degradiruet>.
2. Semenova, Yu.E. Technological Unemployment as a Consequence of Digitalization of the Economy / Yu.E. Semenova, E.N. Ostrovskaya, S.V. Gribanovskaya // Components of Scientific and Technological Progress. – 2020. – № 11(53). – P. 33–36.
3. Voronkova O.V. Of State Property Management / O.V. Voronkova // Components of Scientific and Technological Progress. – 2020. – № 1(43). – P. 24–27.
4. Voronkova, O.V. Improvement of the human capital enterprises management methods / O.V. Voronkova, Yu.E. Semenova, A.Yu. Panova, E.N. Ostrovskaya, S.N. Gribanovskaya // Revista Inclusiones. – 2020. – T. 7. – № S3-5. – P. 541–550.
5. Semenova, Yu.E. Transformation of the Labor Market in the Context of Digitalization of the Economy / Yu.E. Semenova, E.N. Ostrovskaya, A.Yu. Panova // Components of Scientific and Technological Progress. – 2020. – № 12(54). – P. 18–21.

---

### Экономическая безопасность и проблемы трудовой миграции

Ю.Е. Семенова, Е.Н. Островская, А.Ю. Панова

*ФГБОУ ВО «Российский государственный гидрометеорологический университет»,  
г. Санкт-Петербург (Россия)*

**Ключевые слова и фразы:** основные тренды развития рынка труда; технологи-

ческая безработица; трансформация рынка труда; трудовая миграция; экономическая безопасность.

**Аннотация.** В статье рассмотрены проблемы, связанные с трудовой миграцией, и ее влияние на экономическую безопасность регионов и страны в целом. Целью данного исследования было выявление негативных трендов, связанных с трудовой миграцией, и определение влияния этого явления на экономику. Гипотеза исследования заключается в предположении о том, что трудовая миграция может создавать ряд системных проблем как для работодателей, так и для наемных работников, проживающих в регионах-акцепторах, а также привести к негативным трансформациям рынка труда. Основные методы исследования в статье – анализ научной литературы и методы системного анализа. По итогам исследования авторами сделаны выводы о том, что в настоящее время существует ряд объективных угроз, связанных с трудовой миграцией, и рассмотрены меры по их минимизации.

---

© Yu.E. Semenova, E.N. Ostrovskaya, A.Yu. Panova, 2021

UDK 332.021.8

## Management and Infrastructure of Promising International Projects in the Arctic Zone of the Russian Federation

A.I. Shlafman

*St. Petersburg State University of Civil Aviation,  
St. Petersburg (Russia)*

**Key words and phrases:** Arctic region; environmental interests; international relations; international public organizations; political interests; politics; regional economy.

**Abstract.** This article discusses the main priorities for the development of the Arctic regions at the international level. Possible sectors of combining domestic and foreign interests in the development of Arctic territories are identified. Challenges in implementing management of the Arctic regions in the Russian Federation are substantiated.

The Arctic as an independent region, on the territory of which the mining and processing industries are developing, is emerging at a high pace. The domestic sector received an additional impetus for the development of the Arctic zone after the exploration and start of production of hydrocarbons on the shelf in 2017–2018. Large domestic projects consolidate the activities of many subjects of domestic and Western business in the implementation of oil and gas projects.

At the same time, modern researchers [2] note the intensity of international research and economic activity, as well as trade, which need systemic regulation. There are acute problems with the resource provision of current research work; there is an escalation of problems in the provision of services to mining equipment. The natural processes of modernization of technological solutions for telecommunications and energy support of all types of work in the Arctic territories are not beyond the mountain. The spaces of the Arctic zone affect the territorial borders of many states that jointly solve global environmental, economic and political problems.

It is mandatory to coordinate the international interests of economic entities in the Arctic region on the rational use of marine resources.

At the international level, international cooperation has been implemented for the third decade within the framework of the coordinating Council: the Arctic Council (Table 1). There are still a lot of disagreements within it, but all its members understand the universal responsibility for the preservation and development of aquaculture in the Arctic waters, the need to coordinate the joint use of logistics routes that form the shortest communication routes between continents and countries.

The relevance of solving global environmental problems that affect the development of the flora and fauna of the Arctic Ocean is emphasized year after year at meetings of the Arctic Council. Each presiding country sets its own priorities in the direction of the rational use of marine resources.

Next year, 2022, Russia will chair the International Arctic Council for the second time. The range of issues and problems that will be declared for resolution from our country has yet



Table 1. Arctic Council

Council members (chairmanship)	Canada (2013–2015)	Denmark (2009–2011)	Finland (2000–2002, 2017–2019)	Iceland (2002–2004, 2019–2021)	Norway (2006–2009)	Russia (2004–2006, 2022–2024)	Sweden (2011–2013)	USA (1998–2000, 2015–2017)
Permanent participants (indigenous peoples)	International Aleut Association	Arctic Athabaskan Council	Gwich'in International Council	Inuit Circumpolar Council	Association of Indigenous Peoples of the North, Siberia and the Far East of the Russian Federation		Sami Union	
Observers	Organizations and representatives of states on the problems under consideration							

to be systematized. Russia's interests in the Arctic remain the same – it is the rational extraction of raw materials and energy carriers, as well as the organization of unhindered communication between the eastern and western borders of the continent of Eurasia. Combining the economic interests of many economic entities on the way to solving the problems of developing transport communications in the Arctic will allow us to extract a synergistic effect in the development of economic activity of European countries and the countries of the Pacific group. Of course, Russia is a beneficiary when using the routes of the Northern Sea Route (**NSR**), but at the same time, Russia assumes the costs of providing infrastructure in accordance with and in compliance with the goals and objectives of the already formed working and task groups of the Arctic Council (Fig. 1).

It should be noted that the meetings of the Arctic Council made it possible to reach a number of decisions of high international importance.

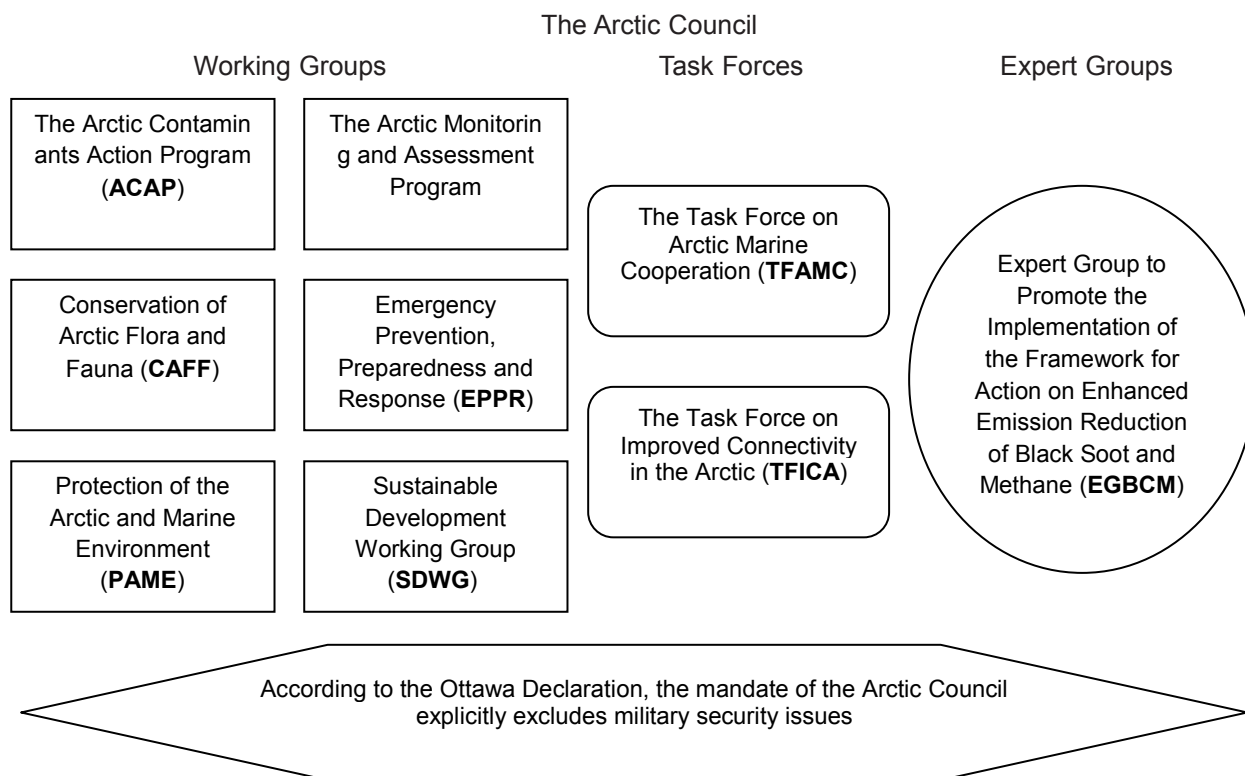
The most significant achievements of international cooperation include the following agreements and development programs:

- 1) cooperation programs were implemented in the development of telecommunications in the Arctic zone;
- 2) recommendations have been developed to reduce black carbon and methane emissions to slow down climate change in the Arctic;
- 3) a number of needs and opportunities have been identified for strengthening and strengthening the regulatory and informational role of the Council in the Arctic Maritime Administration;
- 4) agreement on Cooperation on Preparedness for and Response to Marine Oil Pollution in the Arctic;
- 5) conferences on the problems of small peoples of the North and improving the quality of life in the Arctic were organized at the places of concentration of permanent participants of the forum.

The consistency of organizational decisions and relevant proposals for the development of relations in the Arctic zone from 2022 is largely based on the needs of the property complex of the Northern Sea Route.

Thus, the management of socio-economic processes in the Arctic zone of the Russian Federation is under the administration of the Federal Districts belonging to the coast of the northern seas.

Shipping, and technical support for the operation of the maritime transport infrastructure



**Fig. 1.** Arctic Council Working Groups and Task Forces

along the Northern Sea Route is under the jurisdiction of ROSATOM.

At the same time, the issues of strategic development and the achievement of strategic results for the development of resources in the Arctic, as well as ensuring physical and economic security in this region, are under the control of the presidential Administration of the Russian Federation.

The consistency of organizational decisions on the three subjects of management should allow us to solve a large array of problems related to the development and use of the Arctic space, allow us to optimize the transport sea routes between the countries of the Pacific and Atlantic basins.

Thus, the domestic component in the management system of the Arctic territories today has several levels of hierarchy and does not seem to be a systemically built structure. In our view, there is still a complex process of identifying and coordinating private, regional and federal interests in the development of regions, which should be implemented by combining the competencies of participants in the management system at several levels of management.

### References

1. Voronkova, O.V. Ekonomicheskie posledstviya izmeneniya klimata v arktike / O.V. Voronkova, YU.E. Semenova, T.V. Bikezina // Nauka i biznes: puti razvitiya. – M. : TMBprint. – 2019. – № 2(92). – S. 206–210.
2. Kurochkina, A.A. Ekologo-ekonomicheskie osnovy ustojchivogo razvitiya territorij / A.A. Kurochkina, S.V. Arapov, T.V. Bikezina, O.V. Voronkova, D.N. Verzilin, O.S. Volotovskaya, S.V. Gribanovskaya, O.V. Lukina, T.G. Maksimova, E.N. Ostrovskaya, E.E. Petrova,

A.YU. Panova, YU.E. Semenova, V.YU. Strokina, A.A. CHalganova. – SPb., 2019.

3. Informacionnoe agentstvo Russkogo Obshchestvennogo Dvizheniya “Vozrozhdenie. Zolotoj Vek” [Electronic resource]. – Access mode : <http://xn----ctbsbazhbctieai.ru>.

4. Informacionno-analiticheskoe agentstvo “Delovye novosti” [Electronic resource]. – Access mode : <https://delonovosti.ru/analitika/3921-severnnyy-morskoy-put-i-sueckiy-kanal.html>.

5. informacionno-analiticheskoe agentstvo “PortN’yus” [Electronic resource]. – Access mode : <http://portnews.ru/news/290153>.

6. Informacionnoe agentstvo Zero Hedge [Electronic resource]. – Access mode : <https://www.zerohedge.com/news/real-indicator-global-economy-africa>.

7. Informacionnoe agentstvo “life” [Electronic resource]. – Access mode : <https://life.ru/p/966689>.

8. Delovoj zhurnal “Invest forsajt” [Electronic resource]. – Access mode : <https://www.if24.ru/ledokoly-dlya-sevmorputi>.

9. Informacionnoe agentstvo “Gazeta.Ru” [Electronic resource]. – Access mode : <https://www.gazeta.ru/business/2018/09/10/11957443.shtml>.

10. Informacionnaya sluzhba “YAndeks” [Electronic resource]. – Access mode : <https://zen.yandex.ru/media/tgd/naskolko-serezna-novaia-alternativa-sueckomu-kanalu-5bdb62efe4c44c00aa021752>.

11. Arkticheskij sovet – vedushchij mezhpriatel'stvennyj forum [Electronic resource]. – Access mode : <https://arctic-council.org/ru>.

---

### Управление и инфраструктура реализации перспективных международных проектов в Арктической зоне РФ

А.И. Шлафман

*ФГБОУ ВО «Санкт-Петербургский государственный университет  
гражданской авиации»,  
г. Санкт-Петербург (Россия)*

**Ключевые слова и фразы:** Арктический регион; международные общественные организации; международные отношения; политика; политические интересы; региональная экономика; экологические интересы.

**Аннотация.** В представленной статье отражены основные приоритеты развития Арктических регионов на международном уровне. Выявлены возможные секторы совмещения отечественных и зарубежных интересов в развитии Арктических территорий. Обоснованы сложности в реализации управления арктическими регионами на территории РФ.

---

© A.I. Shlafman, 2021

UDK 719

## Methods of Architectural Planning for the Development of Urban Areas

S.V. Zhuykov

*South Ural State University,  
Yekaterinburg (Russia)*

**Key words and phrases:** architectural planning; development; urban areas.

**Abstract.** The study aims to explore the foreign experience that shows the problems of the development of settlements are almost the same both for the liberal capitalist (market) model of the economy, and for the planned (transitional command and administrative), but the forms and methods of regulating urban development activities are significantly different. The characteristic feature of the Western planning model is the application of project-oriented programs and integrated strategies of urban planning decisions on land use regulation and the calculation of the allocation of productive forces, the definition of resource and urban development potentials, product sales markets, differentiation of land value and the presence of schemes for the delimitation of territories by form of ownership. The hypothesis of the study is to form a methodology for planning the development of the city. The paper uses general scientific research methods. The results are determined by the fact that the planning of regional development of Russia is based on the theory of a unified settlement system, based on the economic and social zoning of the territory by administrative division at three levels (state, regional, district).

Today in Russia, the process of developing planning documentation at the local level for the territories of each locality should become an integral part of socio-economic relations in land use, construction and other sectors of the economy. The development strategy, the general plan of the locality as the main documents regulating the planning processes, as well as the zoning plan of territories and the detailed plan of territories should be developed on the basis of professional forecasting, taking into account demographic, socio-economic, natural-geographical, engineering-technical, environmental, sanitary – hygienic, historical and cultural factors. At the level of the rural settlement, city and adjacent territories of local communities, urban planning documentation is carried out by specialized design and strategic planning bodies (in the manner of European planning commissions) [2].

Fundamental decisions on the location of industrial and social facilities, the protection of the territory from dangerous natural and man-made processes, the protection of nature, historical

and cultural heritage, the priority of development of the territory, etc., should be taken after discussion with public organizations and municipalities, which will help attract private investors and shareholders. In this case, the national planning of economic development will be based on the proposals of the local level on the use of land plots of various forms of ownership for national needs, meeting the interests of large capital and medium and small businesses [1]. The local level of territorial planning should become the core of national strategies and programs for the development of regions (regions and districts).

The modern school of urban planning invariably follows the principles of vertical subordination of urban planning documentation (the scheme of planning the territory of the country, region, district, city, village). In contrast, Western scientists recommend the use of horizontal regulatory mechanisms of regional and local spatial planning, inherent in the countries of Europe and the United States of America.

Despite numerous domestic publications and scientific developments on improving the system of planning of Russian territories and recently adopted legislative acts on management tools in the field of urban planning, unfortunately, the implementation of urban planning documentation at the regional level and the effective development of the socio-economic structure of settlements remain unresolved. The need to improve the existing planning system in Russia led to the choice of the research topic.

The zoning plan is also called zoning by analogy with the American zonal plan for the development of counties and counties, which regulates the parameters of land use, construction, and landscaping of territories (for example, the height of the building for each territorial zone, the development coefficient of the land plot and the possible functions of buildings and structures, and other requirements for sections and paragraphs for specific plots and territories).

Obviously, it would be more correct to call such zoning the rules of land use and development of territories, but the paradox is that such rules were in force in Russia before the adoption of the new urban planning legislation. Therefore, it is necessary to create a new effective planning system developed in Russia, synthesizing the best approaches in the urban planning practice of developed countries of the Western market model of the economy.

Prior to the adoption of new legislative acts in the field of urban planning, conditions and restrictions were provided to customers on the basis of urban planning justifications and architectural and planning tasks for determining the parameters of development or making changes to existing urban planning documentation. This approach significantly reduced the reliability of forecasts and calculations. In particular, the inaccuracy and lack of verification of data on the volume of construction, the environmental situation, the urban characteristics of the area, the functional zoning of territories; forecasts for the main directions of infrastructure development, etc., led to the development of irrelevant urban planning documents. on the basis of which it is impossible to model measures for the sustainable development of the territories of human settlements.

It is the inefficiency of the work of urban planning and architecture bodies at the state, regional, district, and city levels and state design institutes against the background of the complete lack of funds from local budgets for the development of urban planning documentation that requires fundamental changes in the system of planning for the development of territories.

To improve the system of planning territories, in our opinion, it is necessary to change approaches in the field of urban planning, to make a transition from the sectoral to the territorial principle of planning, to apply the world project experience in the development of urban planning documentation on the basis of a new territorial model of economic forecasts and calculations,

which will allow to overcome management imbalances.

Within the framework of the pilot project, it is proposed to create municipal organizations-agencies for the development of regional territories, and then combine design institutes, urban planning and architecture bodies, as well as land management bodies of regional, district and city state administrations into state regional territorial planning agencies. This will make it possible to actually concentrate in one administrative field the management of the processes of spatial development of the Russian regions, their coordination and control [5].

Local self-government bodies, together with the territorial bodies of urban planning and land resources, should analyze the existing urban planning documentation for compliance with the existing development plans for each locality and adjacent territories.

In order to resolve the contradictions between the industry bodies involved in solving issues of territorial development, it is necessary to distinguish between the processes of regional planning of territories and the design of architectural objects. To do this, it is advisable to develop and adopt a draft planning code, which will determine the legal regulation of the entire sphere of urban planning and replace a number of existing regulatory legal acts.

Thus, the formation of a system for planning the development of the territory of settlements will contribute to the effective use of urban planning documentation as a tool for strategic planning and operational management of territories, solving environmental and socio-economic problems, eliminating the degradation of territories, and justifying the development of settlements. The development of localities should take place through the implementation of specific local urban planning decisions regarding new construction, reconstruction, restoration, major repairs of facilities, and improvement of the territory.

The socio-economic development of Russia is possible, in our opinion, only according to the territorial planning principle, as in the leading countries of the world, and not according to the industry (as it is carried out today). To do this, it is necessary to change the vertical hierarchy of urban planning documentation to horizontal links of forecast and project documents of local planning at the level of localities. Calculations of strategic planning and the use of urban planning documentation at the local level should focus not only on solving problematic issues of the development of the locality, but also take into account the national interests defined by special projects, schemes and programs for the development of economic sectors. In turn, the programs of socio-economic development of the regions should be based on real geographical, socio-economic factors and functional relationships defined by the zoning plans of the territories, detailed plans of the territories of localities and beyond.

The final provisions of the Urban Planning Code of the Russian Federation provide for amendments to a number of legislative acts, in particular to Article 12 of this Code, where the competence of local councils determines the possibility of creating bodies on urban planning and architecture by rural, settlement and city councils as part of the executive committees of the council. At the same time, no legislative act defines the powers and competencies of such bodies, but the transfer to the local level of the development of planning documentation of settlements and mechanisms of state regulation of the development of urban settlements is already being carried out. In our opinion, it will be more effective to create at the level of the district state administration a management body for planning the development of territories (agency), which will solve the problems of development and will facilitate the simplification of the procedure for providing customers with comprehensive information about land plots of all categories for the intended purpose and documentation on the conditions, restrictions and opportunities for development and use of the territories of the settlement.

## References

1. YArgina, Z.N. Osnovy teorii gradostroitel'stva / Z.N. YArgina, YA.V. Kosickij i dr. – M. : Strojizadt, 1986. – 329 s.
2. Tarasova, L.G. Vzaimosvyaz' processov upravleniya i samoorganizacii v razvitii krupnyh gorodov / L.G. Tarasova. – Saratov : Izd-vo Sarat. un-ta, 2009. – 38 s.
3. Jodo, M. Gradostroitel'stvo i rajonnaya planirovka / M. Jodo, 2008.
4. Gradostroitel'nyj kodeks Rossijskoj Federacii.
5. Vladimirov, V.V. Osnovy rajonnoj planirovki / V.V. Vladimirov, N.A. Fomin. – M. : Vysshaya shkola, 1995.
6. SP 42.13330.2016. Svod pravil. Gradostroitel'stvo. Planirovka i zastrojka gorodskih i sel'skih poselenij (Aktualizirovannaya redakciya SNiP 2.07.0189\*).
7. Zagitov, S.G. Gazoturbinye elektrostancii na neftegazovyh promyslah / S.G. Zagitov // Nauka. Mysl': elektronnyj periodicheskij zhurnal. – 2017. – T. 7. – № 11. – S. 11–18.

---

## Методика архитектурного планирования для развития городских территорий

С.В. Жуйков

*ФГАОУ ВО «Южно-Уральский государственный университет»,  
г. Екатеринбург (Россия)*

**Ключевые слова и фразы:** архитектурное планирование; городские территории; развитие.

**Аннотация.** Зарубежный опыт свидетельствует, что проблемы развития населенных пунктов почти одинаковы как для либеральной капиталистической (рыночной) модели экономики, так и для плановой (переходной командно-административной), но формы и методы регулирования градостроительной деятельности существенно отличаются. В частности, характерной особенностями западной модели планирования являются: применение проектно-целевых программ и комплексных стратегий градостроительных решений по вопросам регулирования землепользования и расчет размещения производительных сил, определение ресурсных и градостроительных потенциалов, рынков сбыта продукции, дифференцирование стоимости земли и наличие схем разграничения территорий по форме собственности. Гипотеза исследования предполагает формирование методики планирования развития города. В работе использованы общенаучные методы исследования. В результате определено, что планирование регионального развития России базируется на теории единой системы расселения, опирающейся на экономическое и социальное районирование территории по административному делению на трех уровнях (государственном, областном, районном).

---

© S.V. Zhuykov, 2021

## List of Authors

**Sukhanov Yu.V.** – Candidate of Technical Sciences, Associate Professor, Department of Technology and Organization of the Forestry Complex, Institute of Forestry, Mining and Construction Sciences, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: yurii\_ptz@bk.ru

**Суханов Ю.В.** – кандидат технических наук, доцент кафедры технологии и организации лесного комплекса Института лесных, горных и строительных наук Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: yurii\_ptz@bk.ru

**Tsarev T.A.** – Student, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: yurii\_ptz@bk.ru

**Царев Т.А.** – студент Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: yurii\_ptz@bk.ru

**Vasilyev A.S.** – Candidate of Technical Sciences, Associate Professor, Department of Technology and Organization of the Forestry Complex, Institute of Forestry, Mining and Construction Sciences, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: alvas@psu.karelia.ru

**Васильев А.С.** – кандидат технических наук, доцент кафедры технологии и организации лесного комплекса Института лесных, горных и строительных наук Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: alvas@psu.karelia.ru

**Ivashnev M.V.** – Doctor of Technical Sciences, Associate Professor, Department of Life Safety and Health-Saving Technologies, Petrozavodsk State University, Petrozavodsk (Russia), E-mail: ivashnev.mv@yandex.ru

**Ивашнев М.В.** – доктор технических наук, доцент кафедры безопасности жизнедеятельности и здоровьесберегающих технологий Петрозаводского государственного университета, г. Петрозаводск (Россия), E-mail: ivashnev.mv@yandex.ru

**Gribanovskaya S.V.** – Senior Lecturer, Department of Economics, Environmental Management and Accounting Systems, Russian State Hydrometeorological University, St. Petersburg (Russia), E-mail: avgrib@mail.ru

**Грибановская С.В.** – старший преподаватель кафедры экономики предприятия природопользования и учетных систем Российского государственного гидрометеорологического университета, г. Санкт-Петербург (Россия), E-mail: avgrib@mail.ru

**Voronkova O.V.** – Doctor of Economics, Professor, Department of Environmental Management Economy and Accounting Systems, Russian State Hydrometeorological University, St. Petersburg (Russia), E-mail: journal@moofrnk.com

**Воронкова О.В.** – доктор экономических наук, профессор кафедры экономики предприятия природопользования и учетных систем Российского государственного гидрометеорологического университета, г. Санкт-Петербург (Россия), E-mail: journal@moofrnk.com

**Panova A.Yu.** – Candidate of Economic Sciences, Associate Professor, Department of



Economics of Environmental Management, Russian State Hydrometeorological University, St. Petersburg (Russia), E-mail: semenjulia69@mail.ru

**Панова А.Ю.** – кандидат экономических наук, доцент кафедры экономики предприятия природопользования Российского государственного гидрометеорологического университета, г. Санкт-Петербург (Россия), E-mail: semenjulia69@mail.ru

**Semenova Yu.E.** – Candidate of Economic Sciences, Associate Professor, Department of Economics of Environmental Management, Russian State Hydrometeorological University, St. Petersburg (Russia), E-mail: semenjulia69@mail.ru

**Семенова Ю.Е.** – кандидат экономических наук, доцент кафедры экономики предприятия природопользования Российского государственного гидрометеорологического университета, г. Санкт-Петербург (Россия), E-mail: semenjulia69@mail.ru

**Ostrovskaya E.N.** – Candidate of Economic Sciences, Associate Professor, Department of Economics of Environmental Management, Russian State Hydrometeorological University, St. Petersburg (Russia), E-mail: semenjulia69@mail.ru

**Островская Е.Н.** – кандидат экономических наук, доцент кафедры экономики предприятия природопользования Российского государственного гидрометеорологического университета, г. Санкт-Петербург (Россия), E-mail: semenjulia69@mail.ru

**Shlafman A.I.** – Candidate of Economic Sciences, Associate Professor, Department of Management, St. Petersburg State University of Civil Aviation, St. Petersburg (Russia), E-mail: izevich@yandex.ru

**Шлафман А.И.** – кандидат экономических наук, доцент кафедры менеджмента Санкт-Петербургского государственного университета гражданской авиации, г. Санкт-Петербург (Россия), E-mail: izevich@yandex.ru

**Zhuikov S.V.** – Architect, South Ural State University, Yekaterinburg (Russia), E-mail: renderwork74@gmail.com

**Жуйков С.В.** – архитектор, Южно-Уральский государственный университет, г. Екатеринбург (Россия), E-mail: renderwork74@gmail.com

---

**COMPONENTS OF SCIENTIFIC AND TECHNOLOGICAL PROGRESS**  
**№ 5(59) 2021**  
SCIENTIFIC AND PRACTICAL JOURNAL

---

Manuscript approved for print 18.05.21  
Format 60.84/8  
Conventional printed sheets 3.02  
Published pages 1.77  
200 printed copies

16+

Printed by Zonari Leisure LTD. Paphos