



Digital Economy: The Possibility of Sustainable Development and Overcoming Social and Environmental Inequality in Russia

Economía digital: la posibilidad del desarrollo sostenible y la superación de la desigualdad social y ambiental en Rusia

Tatiana S. MARTYENKO [1](#); Inna A. VERSHININA [2](#)

Received: 06/05/2018 • Approved: 12/06/2018

Contents

[1. Introduction](#)

[2. Methodology](#)

[3. Results](#)

[4. Conclusions](#)

[Acknowledgement](#)

[Bibliographic references](#)

ABSTRACT:

The rapid development of technology allows us to consider them as a source of possible harmonization of relations between society and nature. The peculiarities of industrial enterprises' transition to the "digital" are revealed, the prospects, limitations, and risks of this process are researched. The article considers spatial, environmental and socio-ecological inequality, including unequal distribution of environmental risks, as well as their consequences, which negatively affect the duration and quality of life of the nowadays Russian society.

Keywords: ecological modernization, spatial inequality, ecological poverty, sustainable development.

RESUMEN:

El rápido desarrollo de la tecnología nos permite considerarlos como una fuente de posible armonización de las relaciones entre la sociedad y la naturaleza. Se revelan las peculiaridades de la transición de las empresas industriales a lo "digital", se investigan las perspectivas, limitaciones y riesgos de este proceso. El artículo considera la desigualdad espacial, ambiental, socio-ecológica, incluida la distribución desigual de los riesgos ambientales, así como sus consecuencias, que afectan negativamente la duración y la calidad de vida de la sociedad rusa.

Palabras clave: modernización ecológica, desigualdad espacial, pobreza ecológica, desarrollo sostenible.

1. Introduction

The rapid development of technology, on the one hand, changes the image of the world around us, and on the other hand, it helps people understand the global nature of the problems and challenges facing humanity. The major risks of the millennium century are connected with the aggravation of ecological problems and the intensification of socio-

economic inequality. According to the U.S. sociologist Michael Burawoy, environmental inequality is the first realized and actually global problem: "Are there, however, issues around which North and South, East and West could unite, human rights that they could commonly defend? There is one way in which everyone's life is threatened, and that is through the degradation of the environment. Hence the broad appeal of the environmental justice movement. Global warming, toxic waste, and pollution do not recognize social or geographical boundaries. We are all affected by the destruction of the environment. Yes, but not equally affected" (Burawoy, 2007). Analysis of the causes and consequences of climatic, food, economic and other crises shows that most social and environmental problems are inextricably interconnected. Throughout its history, mankind has utilized and transformed nature to its own benefit (from terraced farming in ancient China, South America and other regions to modern hydro power plants), therefore environmental problems cannot be considered as socially neutral. Moreover, political or economic decisions taken at the level of national governments also have environmental consequences (Harvey, 1993). Thus, the analysis of social and environmental inequalities allows for better understanding of the interconnection of economic, political, social and environmental aspects of injustice and social stratification in modern societies (Osipova et al., 2017). Sustainable development envisages solving a range of problems, not only environmental, but also social ones.

The article is aimed to consider the interconnection between sustainable development and environmental modernization of industry that can be based on digitization, which, on the one hand, helps to overcome social and environmental inequalities, and on the other, imposes new risks and challenges.

2. Methodology

In the most general form, the concept of sustainable development presupposes the regulation of certain spheres of society's life in order to ensure that future generations will be able to live without compromising the quality of their lives. It involves overcoming a wide range of problems, from poverty and violence against an individual to ensuring availability of healthcare and education. Sustainable development requires accounting for environmental challenges and risks as well. According to the latest project for the sustainable development concept implementation ("The 2030 Agenda for Sustainable Development"), adopted in 2015, it involves the achievement of 17 goals. The importance of the environmental component is emphasized by the fact that 7 out of 17 goals are directly related to the vital and environmental aspects of human existence.

Despite the fact that the sustainable development strategy was adopted in Russia as early as in 1996, the prospects for ensuring environmental sustainability through modernization of production, agriculture and education, as well as increasing the population's awareness of resource saving and environmental protection, have not been defined so far. Key development priorities have been identified, but still the number of implemented programs is very low despite the increased attention to this issue in the recent years. One of the attempts to solve these problems is the development of Russian industry ecological modernization concept.

Problems of ecological modernization have been discussed since 1980s. Ecological modernization is generally understood as "changes in accordance with the latest, modern environmental requirements and norms, the implementation of which leads to the elimination of problems between human and their environment, society and nature" (Kulyasov, 2005). Taking into account the requirements stipulated by international agreements and government regulations, Russian industry is gradually striving to shift to less environmentally harmful production methods.

There are two ways of ecological modernization:

1. The "strong" one includes a serious transformation of society's social institutions and is closely related to the concept of social ecology, according to which environmental problems cannot be resolved apart from social problems. It is assumed that environmental problems correspond to a society built on domination and exploitation. However, this option requires radical transformations in various spheres of public life, therefore it is difficult to implement.

2. The "weak" way of modernization, which has become widespread and distinctive, for Russia inter alia, is aimed at the introduction of new technological solutions and innovations that should ensure a reduction in pollution and destruction of the environment (Kulyasov, 2005).

Sustainable development requires production modernization, leading both to an increase in economic efficiency, and to reduction in harmful emissions level, careful use of natural resources, low-waste production, allows not only to increase economic performance, but also to improve the living conditions of people (Sergeeva et al., 2017), reducing the vital inequality associated with the duration and quality of life.

3. Results

3.1. Social and Environmental Challenges in Nowadays Russia

All socio-political projects are environmental projects and vice versa (Harvey, 1993), since nature and the environment are an integral part of social life. Environmental problems of anthropogenic origin have always existed. However, their scale and possible consequences are a new and disturbing phenomenon of the modern times due to the unprecedented speed of social and environmental transformations. Social and environmental inequality reflects the unfair distribution of environmental risks and the restriction of access to vital resources (clean air, etc.), which the most unlike countries of the world face. Ecological problems are extremely relevant for our country as well. The diversity and richness of natural resources contribute to the development of extractive and manufacturing industries that lead to economic prosperity of the country, but at the same time threatens Russia with serious environmental problems. These problems are related to soil, water and air pollution, deforestation, waste disposal, destruction of unique natural areas and reduction of biodiversity.

The size of the territory and the unequal distribution of objects, significantly affecting the environment, lead to the emergence of social and environmental inequalities between the regions of Russia and their inhabitants. The ecological evaluation of spatial inequality is closely related to other types of inequality, for example, inequality of income and wealth, inequality between urban and rural regions, etc. Ecological poverty and inequality cover broad groups of the population and adversely affect the health of large social groups, undermining their efficiency and worsening life conditions.

According to the President's Decree, "the transition to sustainable development of the Russian Federation as a whole is possible even if the sustainable development of all its regions is ensured" (Concept of the transition, 1996). Thus, the concept of sustainable development is today the leitmotif for all social and technological transformations.

Russia is a country where industry remains the most important sector of the national economy. By share of employed in industry, the construction sector in particular, Russia (27.2%) holds the second position among G7 states only after Germany (27.7%), and among the BRICS states – only after China (29.3%), and in 2016–2017, a positive trend was recognized in the development of domestic industry (Grigoryev et al., 2017). In addition to the above, it should be noted that industry in the country is concentrated in 20 regions accounting for two thirds of the national industrial production, including 70.4% of the extractive sector and 66.9% of the processing industry, which leads to unequal spatial development of the country. The dynamics of industrial production in the country serves as another confirmation of this fact: the increase in industrial production in 2016 (by 2015) by regions ranged from +40.2% to –13.7% (Grigoryev et al., 2017). Unequal development results into spatial and social and environmental inequalities.

It is noted in the reports of international organizations that spatial inequality in Russia, which includes differences in the quality of life, income and living standards among the population of different areas, a particular case of which is regional inequality, represents a cause for serious concern (Ukhova, 2014). Income levels, health and quality of life in our country in some cases correlate with the areas of residence. The research data shows that

along with the gap between the life expectancy of men and women (10.79%), which is typical for Russia, there are significant differences in the life expectancy in specific areas. The maximum life duration was recorded in the Republic of Ingushetia and averaged 80.82 years. The minimum one – in the Republic of Tyva with 64.21 years. While the average for Russia is 71.87 (Federal State Statistics Service, 2018). Data on life expectancy and number of diseases correlate with the data on water and air pollution.

One of the reasons for the unfavorable ecological situation in Russia is obsolete equipment and treatment facilities installed at industrial enterprises, hence the regular attempts of the government to initiate production modernization. These relate mostly to the economic efficiency and competitiveness of Russian producers, however, in recent years the awareness is increasing of the need for strict measures to stabilize and improve the ecological situation. Under active development are also measures to reduce social and environmental inequalities between Russian regions, focused on reducing harmful production and minimizing environmental damage. These changes are part of the global program for the transition to sustainable development, initiated by international organizations and actively supported by states, including the Russian Federation.

3.2. Ecological Modernization of Russian Industry

Industry in our country is undergoing multidirectional modernization. One of such directions is technical renewal of the obsolete production facilities. For example, Gazprom Neft plans to spend more than 400 billion rubles on the modernization of the Omsk and Moscow oil refineries (Vedomosti, 2018). Nevertheless, still equally important to increase the share in the economy accounted for by knowledge-intensive and high-tech industries that serve as a catalyst for economic development and contribute to the formation of an innovative model of the country's development.

According to the law adopted in 2014, in the coming years the modernization of industry in our country will be implemented under the concept of "best available techniques" (BAT) (Ecological upgrade, 2017). The term BAT appeared as early as in 1984, meaning "the most advanced achievements of science and technology, causing the least damage to nature, safe for humans and at the same time beneficial from an economic point of view. They must not only protect the environment from the negative industrial impact, but also be profitable for the enterprises implementing them" (Ecological upgrade, 2017). Active implementation of this law's main provisions is planned for 2019 and provides for high penalties for enterprises that do not meet the established requirements.

Industrial modernization is conditioned not only by the legislative acts the state develops, but also by raising the general level of environmental consciousness and culture in modern societies. The quality and value of products produced today are not the only levers shaping the public opinion about an enterprise. The interest in forming and maintaining the positive image of Russian companies among local population and global community contributes to the enhancement of environmental responsibility and the introduction of an environmental management system at some enterprises. Improving the environmental situation is one of the priorities of Norilsk Nickel's activities. The president of the company Vladimir Potanin believes that by 2023 the company will have managed to reduce emissions of sulfur dioxide by 75%, including through the implementation of the Sulfur Project: "Although it still costs a lot of money, about 150 billion rubles in Norilsk only, we will invest in solving this problem, but we are confident that this will pay off many times over" (Vedomosti, 2018). The company is already upgrading its enriching factory in Zapolyarny thus reducing the negative impact on the environment. Kola Mining & Metallurgical Company (part of the Norilsk Nickel Group of Companies) is a regular participant of the "Zero Negative Impact On The Environment" campaign, invests dozens billion rubles in environmental activities (Vedomosti, 2018), while reducing sulfur dioxide emissions to the atmosphere.

In the oil and gas industry there is companies' environmental responsibility rating, which has been headed by Sakhalin Energy for two consecutive years (2016 and 2017) – the company reporting annually on sustainable development since 2009 (Vedomosti, 2018). For compiling an online version of the report, the company received the prize of Digital Communications

AWARDS in the Digital Projects and Strategies category.

In March 2018, the epoch of using open-hearth furnaces in Russian metallurgical industry came to its end, since the OHF do not meet modern ecological standards. The Ministry of Industry and Trade of the Russian Federation insisted on decommissioning of environmentally faulty open-hearth furnaces at metallurgical plants, since five years ago this production in Russia still accounted for 28% of industrial emissions into the atmosphere and over 6% of wastewater discharge (Vedomosti, 2018). OHF are considered as obsolete production that should give way to more modern and environmentally friendly technologies, which will significantly reduce harmful emissions into the atmosphere.

3.3. Industry 4.0: advantages and challenges of industry digitization

In the course of industrial modernization, digitization and the introduction of new technologies are supposed to play a highly important role, as these are more and more often considered as drivers of positive changes in the industrial enterprises' activities: Industry 4.0, creating "smart factories", allows for synthesizing digital, biological, chemical and other technologies, facilitates the interaction of virtual and material production systems (Schwab, 2017). Digitization of production leads to its ecological modernization, which ensures not only increasing productivity due to saving various resources, but also the sustainable development of territories, states and the global community as a whole. Ecological modernization, based on digitization, is already adopted as a basis of state environmental strategy in the Netherlands, applied in environmental politics in Japan, Germany and the United Kingdom, is used as a scientific theory for social and environmental relations enhancement in other developed countries (Sergeeva et al., 2017). Thus, digitization is viewed as one of the main ways of ecological modernization.

The Readiness for the Future of Production Report 2018 published by the World Economic Forum notes that Russia has a good industrial base, which in many respects is a legacy of the past, but does not actively introduce new technologies, thus demonstrating a low level of readiness for the future (Readiness for the Future of Production Report, 2018). At the same time, the authors of the report indicate that the country has many strong points that can be transformed into competitive advantages provided that innovative technologies are introduced and cooperation between the state, industry and education is enhanced, which should result in the development of regional innovation and research centers.

According to the Strategy for the Development of the Information Society in the Russian Federation for 2017–2030 adopted on May 9, 2017, the main priorities include the increase in the share of the digital economy, providing the population with access to Internet resources, formulation of the general idea of using digital resources through online education and online healthcare systems (On the Strategy, 2017). Nevertheless, the economy of our country is not digital at present. For example, the amount of online sales of goods and services is insignificant. It amounts to 2.3% of GDP: "According to McKinsey, the share of digital economy in Russia's GDP is 3.9%, which is two to three times lower than that of the leading countries such as the USA, Japan, Singapore, Israel." At the same time, the digitization of the economy (including the industrial sector) can ensure its significant growth.

The program "Digital Economy of the Russian Federation", adopted in 2017, presupposes the implementation of projects related to healthcare, smart cities, public administration, etc., but the key target is to create the national digital economy ecosystem where data in the digital form are the key factor of production in all spheres of social and economic activity (Digital Economy, 2017). Implementation of the program should be based on the effective interaction among business, scientific and educational community, the state and citizens. That said, it should be also noted that the program pays insufficient attention to the need of production modernization and digitization, which can and should become the basis of the economy and sustainable growth in the 21st century.

Chairman of the Board of Directors and CEO of General Electric in 2000–2017 Jeffrey Immelt

believes that industrial companies should become digital to survive (These factories, 2016). The creation of the Brilliant Factory using artificial intelligence and 3D printing allows General Electric to design, create and test new parts within a few hours instead of days or weeks required before. Digitization of production reduces costs, allowing for timely detection of defects and avoiding subsequent product recall, and consumer demand analysis with the use of modern technologies reduces unplanned downtime by 10%–20%.

Technologies that allow to organize and direct activity remotely, control production and ensure its safety are already gaining popularity. For example, such technologies are actively introduced in oil and gas producing enterprises throughout the whole production chain (Dmitrievsky et al., 2016). Modern technologies are used to search for deposits, manage systems that are beyond direct human access (for example, underwater or under-ice ones), to monitor the efficiency and environmental friendliness of production through a system of modern sensors, etc. Most technologies in this area are based on the artificial intelligence developments. Oil deposits intellectualization is gaining momentum, "digital wells" appear (Dmitrievsky et al., 2016). Most authors stress that introducing such technologies is highly effective, which is manifested in an increase in the production scale. Nevertheless, the environmental component often remains beyond the discussions, which is not true, since digitization, as a rule, involves minimizing the damage to the environment.

Regardless the obvious positive effects from the industrial modernization, related, for example, to ensuring greater control and safety of production, this process is characterized by conflicting consequences. It is important to emphasize the problems that arise when trying to accelerate the Russian economy and life in general digitization speed. The increase in the digital economy development speed generates numerous risks associated with the undeveloped transition programs, as well as the general lag of certain sectors of Russian industry from the global production development level.

It should be noted that both these problems include not only the technological aspect, but also imply the need for serious transformations of ecological consciousness and ecological culture. These changes include the formation of new daily individual practices aimed at improving environmental safety. It is noted that "the transition to digital life technology requires not only a new level of knowledge and broad competence, but also a higher level of mutual trust between the two parties of the virtual communication of the process participants, a high spiritual and ecological culture and responsibility for remote operations of complex production and life activities" (Kal'ner, 2018). The nature of the activities of many industrial enterprises contradicts with the principles of social and environmental equality and sustainable development of the territories, however, examples of some companies (General Electric, Procter & Gamble, etc.) prove that environmental responsibility not only can be a socially approved position, but also generate economic profit by increasing productivity.

Digitization is not only a fashionable trend, but also a condition for ecological modernization in the nowadays world. Therefore, it is a dead end to plan the ecological modernization and sustainable development programs without taking into account the digital component, and the transition to "digital" becomes a factor of sustainable development in the same way as projects aimed at reducing the harmful impact of industrial enterprises on the environment. This transition assumes a revision of the entire paradigm of acting entities economic life organization. The Russian version of ecological modernization cannot ignore the digital aspects notwithstanding the risks associated with their implementation and wide outspread.

4. Conclusions

Information and communication revolution affected to varying degrees, all members of the international community in the socio-political, economic and cultural spheres (Osipova, 2014). Introduction of computer-based manufacturing systems, new transport and communication systems increased connectivity, interdependency and interaction on all social layers and in all areas – economics, politics, culture, science and education (Polyakova, 2015). Consequences of revolutionary transformations changed the life of modern people beyond recognition and made modern social scientists to recognize new features of society

(Dobrinskaya et al., 2018). Modern technologies (Internet of things, artificial intelligence, robotics, etc.) stimulate not only the development of new business models and production digitization, but also make us think about the need to shift focuses in assessing the effectiveness of the economy, take into account not only the GDP volume, but also the quality of people's life. Thus, we can note the trend of the transition of priority from the economic indicators to humanitarian ones. The main drivers of production development are recognized to be not only innovations and technologies, but also human capital and sustainable development (Readiness for the Future of Production Report, 2018).

Some researchers identify the problems of capitalism associated with the unequal geographical development (Harvey, 1993), which leads to social and environmental inequality, and consider various catastrophic scenarios (Mann, 2013). However, according to another point of view, we are witnessing the fourth industrial revolution, that is cardinal changes in all industries, which result in the birth of new business models, the radical transformation of production systems and the change of paradigms in the social sphere (Schwab, 2017). However, it is necessary to understand that new technologies not only reduce environmental risks, but also create new ones. For example, 3D printing can minimize resource costs, but will lead to an increase in the amount of garbage (Schwab, 2017). However, this problem can be solved through its recycling and reuse. Gaining relevance now is the problem of forming ecological culture among the population (Korkia et al., 2017) that should encompass the most diverse aspects of everyday life, which in turn can contribute to reducing resource consumption, stabilizing the ecological situation and reducing social and environmental inequality. At the same time, it is necessary to understand that digital technologies, like all complex phenomena, unite economic, social, axiological, political and other aspects, and therefore represent an ambiguous phenomenon, and their implementation requires detailed elaboration of security mechanisms.

Acknowledgement

The research received financial support of the Russian Foundation for Basic Research (RFBR), project " New modes of social inequality and its peculiarities at the case of contemporary Russia", No. 18-011-01106.

Bibliographic references

- BURAWOY, M. (2007). Public Sociology for Human Rights. *Journal of Sociology and Social Anthropology*, X (4): 27–44. (In Russ.)
- DMITRIEVSKY, A. N., MARTYNOV, V. G., ABUKOVA, L. A., EREMIN, N. A. (2016). Digitalization and Intellectualization of Oil and Gas Deposits. *Automation and IT in Oil and Gas Field*, 24(2): 13–19. (In Russ.)
- DOBRINSKAYA, D., VERSHININA, I. (2018). New Connectography: Networks of Cities in the Global World. *Revista ESPACIOS*, 39(16). Retrieved from: <http://www.revistaespacios.com/a18v39n16/18391607.html>
- GRIGORYEV, L. M., GOLYASHEV, A. V., LOBANOVA, A. A., PAVLYUSHINA, V. A. (2017). Regional Differences in the Dynamics of Industrial Production in Russia: Modern Trends. *Spatial Economics*, 4: 148-169. DOI: 10.14530/se.2017.4.148-169. (In Russ.)
- HARVEY, D. (1993). The Nature of Environment: the Dialectics of Social and Environmental Change. In: *Socialist Register 1993: Real problems, false solutions* ed.by Miliband R., Panitch L. Vol. 29. London: Merlin Press. P. 1-51.
- KAL'NER, V. (2018). Digital economy and ecological safety of vital activity. *Ecology and Industry of Russia*, 22(1): 62-67. (In Russ.) DOI:10.18412/1816-0395-2018-1-62-67.
- KORKIA, E., KURBANOV, A., MAMEDOV, A. (2017). Concept of Ecological Culture: "Limits of Growth" or Reserves of Development. *Ecology and Industry of Russia*, 21(6):58-63. (In Russ.) DOI:[10.18412/1816-0395-2017-6-58-63](https://doi.org/10.18412/1816-0395-2017-6-58-63).
- KULYASOV, I. P. (2005). Ecological Modernization Theory. *Journal of Sociology and Social Anthropology*, VIII (3): 100-113. (In Russ.)

MANN, M. (2013) *The End May Be Nigh, But for Whom?* In: *Does Capitalism Have a Future?* NY.: Oxford University Press.

OSIPOVA, N. G. (2014). Inequality in the era of globalization: essence, institutions, regional specificity and dynamics. *Moscow State University Bulletin. Series 18. Sociology and Political Science*, (2), 119–141. Retrieved from <http://vestnik.socio.msu.ru/jour/article/view/29>.

OSIPOVA, N., POLYAKOVA, N., DOBRINSKAYA, D., VERSHININA, I., AND MARTYNNENKO, T. (2017). Social inequality: Recent trends. *Ponte*, 73(5):259–273.

DOI:10.21506/j.ponte.2017.5.49

POLYAKOVA, N. L. (2015). New theoretical perspectives in sociology at the beginning of the 21st century. *Moscow State University Bulletin. Series 18. Sociology and Political Science*, 21(2), 29–46. <https://doi.org/10.24290/1029-3736-2015-0-2-29-46>.

Readiness for the Future of Production Report 2018. (2018). Geneva: World Economic Forum. 266 p.

Russian Federation Federal State Statistics Service. (2018). Retrieved 03 May 2018, from <http://www.gks.ru/>. (In Russ.)

SCHWAB, K. (2017). *Fourth Industrial Revolution*. New York, Crown Business. 192 p.

SERGEEVA, Z. H., ZAKIROVA, L. A. (2017). Ecological Modernization of Production on the Path of Sustainable Economic Development of the Russian Federation. *Managing Sustainable Development*, 4: 59-64. (In Russ.)

These factories are crunching production time with artificial intelligence. (2016). Retrieved 03 May 2018, from <http://www.businessinsider.com/sc/artificial-intelligence-change-manufacturing>.

UKHOVA, D. (2014). *After equality: Inequality trends and policy responses in contemporary Russia*. Oxfam Discussion Paper. May 2014. Oxford: Oxfam GB. 34 p.

Vedomosti. (2018). Retrieved 03 May 2018, from <https://www.vedomosti.ru/>. (In Russ.)

On the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030. (2017). Retrieved 03 May 2018, from <http://www.kremlin.ru/acts/bank/41919>. (In Russ.)

Digital Economy of the Russian Federation. (2017). Retrieved 03 May 2018, from <http://static.government.ru/media/files/9gFM4FHj4PsB79I5v7yLVuPgu4bvR7M0.pdf>. (In Russ.)

Concept of the transition of the Russian Federation to sustainable development (Decree of the President, April 1, 1996). (1996). Retrieved 03 May 2018, from <http://pravo.gov.ru/proxy/ips/?docbody=&firstDoc=1&lastDoc=1&nd=102040449>. (In Russ.)

Ecological upgrade: the technological re-equipment in Russia. (2017). Retrieved 03 May 2018, from <http://tass.ru/obschestvo/4131190>. (In Russ.)

1. Department of Sociology. Lomonosov Moscow State University, Moscow. Chair of Contemporary Sociology. Contact e-mail: modernsoc@socio.msu.ru

2. Department of Sociology. Lomonosov Moscow State University, Moscow. Chair of Contemporary Sociology. Contact e-mail: modernsoc@socio.msu.ru

Revista ESPACIOS. ISSN 0798 1015
Vol. 39 (Nº 44) Year 2018

[Index]

[In case you find any errors on this site, please send e-mail to webmaster]