

GREEN TRANSFORMATION AS A FACTOR IN THE SHIFT OF THE DEVELOPMENT PARADIGM

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Abstract. The article examines certain aspects of the prospects of green transformation as an opportunity for a transition to the noosphere, which is considered a new paradigm for the development of humanity. The formation of a noospheric society addresses the goals of the “green concept” within the framework of sustainable development. The green development vector, whose priorities include achieving carbon neutrality in the coming decades, creates favorable prerequisites for strengthening its demanded role in this complex and multidimensional evolutionary process. The authors attempt to rethink the consequences of dynamic changes in the biosphere, which are to a significant extent associated with the process of green transformation and the formation of new principles of a global ecosystem, within which a characteristic model of human behavior and forms of relations are taking shape.

Keywords: *Green transformation, green development, noosphere, biosphere, global ecosystem, Sustainable Development Goals (SDGs).*

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1. Introduction

The current stage of human development, characterized by dynamic, complex, multifaceted and often contradictory changes, is also marked by the intensification and deepening of previously existing problems within the “human-nature-society” system. The increasing negative impact of numerous factors on natural processes contributes to the continuation of “irrational development”, posing a threat to humanity. This situation highlights certain features of the ecological state of contemporary humanity, which lives beyond its ecological capacity and causes damage to the environment.

Today, excessive resource consumption and environmental pollution are the main causes of the historically formed type of civilization’s evolution in relation to nature. Another contributing factor is the sharp increase in global population, growing human needs and the resulting intensified pressure on the environment. Equally important is the prevailing perception that nature is abundant in resources and primarily exists to serve humanity. In this context, as noted in UNEP documents (*Global Perspective: Human*

Stories, 2025), humanity must strive to redirect its path toward ensuring a healthy planet, people and economy.

Thus, global challenges and complex contemporary problems, which pose significant threats to humanity, “demonstrate the vulnerability of all countries and peoples worldwide” (Shapoval *et al.*, 2025). In the new realities of the modern world, socio-ecological systems cannot achieve the necessary integrity and security and risk collapse under new large-scale challenges, exacerbating problems of uneven global development. The growing influence of numerous factors on the biosphere, often without regard to its potential capacities, underscores the complexity of contemporary issues, requiring special attention from the international community and systematic responses to these challenges.

The consequences of new transformations are particularly important in the context of understanding their potential impact on shaping the future, which will largely depend on the implementation of the inevitable process of “green” transformation (the green economy concept) in many contemporary societies. In this regard, the active promotion of green development concepts - aimed at preserving natural resources and the environment, as well as advancing environmentally friendly goods and services - is increasingly recognized as an objective and growing need for creating an ecologically sustainable society and a model of the future (Mamedov & Qurbanov, 2024).

The growing awareness of the scale of the ecological crisis and the insufficiency of actions taken to address it, particularly the implementation of green concepts, underscores the necessity of transitioning humanity and the biosphere to a new qualitative state. This new qualitative state can be conceptualized as a transition to the noosphere, the highest stage of biosphere evolution, which is linked to the development of a society exerting a profound impact on natural processes.

Recently, noospheric ideas, in which rational human activity becomes a determining factor of development, have gained renewed relevance and continue to receive recognition across various scientific disciplines. Noospheric concepts share certain similarities with the green development paradigm, particularly regarding the balance between development and nature conservation, as well as the role of humans in nature.

The purpose of this study was to examine certain aspects of the green transformation process, which, as a long-term trend in global development, may provide the best opportunity for contemporary humanity to transition to a qualitatively new state - a model of ecological civilization. The noosphere is viewed as such a model of the future, remaining a desirable and theoretically plausible alternative for development.

2. Theoretical background

Regarding the problems of biosphere preservation and the construction of an ideal society as the ultimate goal of social progress, a number of concepts and perspectives exist. The awareness of the urgent need to address pressing environmental issues for humanity’s survival has led to the development of an ecologically oriented development strategy (Piskulova, 2019). The global nature of ecologicalization, as a process of achieving the Sustainable Development Goals, complying with the United Nations Framework Convention on Climate Change, the Paris Agreement and other initiatives, continues to acquire particular significance in the context of implementing the green agenda.

Today, the “green” trend, as an objective and growing need of modern societies, continues to encompass most regions of the world. Having become a global long-term

phenomenon, this dynamic process remains one of the important factors determining the prospects for the socio-economic development of the entire world (Abbasov *et al.*, 2024), the transition of society and the environment to a new qualitative state and the formation of new relations between humanity and nature.

All these features and new systems of human development, for the ecological survival of which, according to Subetto (2023), “in the 21st century there exists a noospheric imperative”, can be considered in the context of Vernadsky’s noosphere theory. The central idea of this theory is that humanity, in the process of development, acquires increasing distinctions from other components of the biosphere. Having become a new biogenic and nature-forming force, humanity must take into account natural laws during the development of both society and the natural environment.

The growing human influence on nature and the large-scale consequences of human activity, which disrupt the established ecological balance and accelerate the global degradation of the biosphere, served as the basis for the creation of the noosphere doctrine. Undoubtedly, changes in the biosphere are inevitable and the transition of the biosphere to the noosphere is considered a natural process (Vernadsky, 2012). In the complex process of the optimal formation of the noosphere, which Vernadsky views simultaneously as both a process and a result, it is important not only to preserve the biosphere but also to ensure its natural evolution, through which new forms of its organization are created.

In the new state of the biosphere - the highest stage of its evolution, as considered by Vernadsky - human intellectual and rational activity will determine the development of the future. At the same time, it is important to note that, according to some specialists (Kochergin & Kochergin, 2015), all necessary and sufficient conditions for this transition do not yet exist and the current reality suggests that the noosphere should be understood more as a symbol of faith, a symbol of hope for survival.

Thus, “the doctrine of the noosphere is an extraordinarily complex, unique and contradictory phenomenon in our science, philosophy and culture” (Plotnikova, 2004). It is distinguished by the close connection of natural laws with the socio-political factors of society. Research in this field is gradually evolving from fragmentary studies into systematic investigations, acquiring not only a philosophical but also a general scientific character.

Without delving into a detailed analysis of the multifaceted and complex category of the noosphere, which is beyond the scope of the present work, it should be noted that there is currently a need to expand the discourse framework for rethinking the fundamental principles of this planetary phenomenon, taking into account dynamic changes in the biosphere that are significantly linked to green transformation. The latter establishes a new level of interaction with the biosphere through sustainable development. Contemporary scientific prospects are directed toward “green” technologies, which would not be possible without rethinking humanity’s role in organizing activities that impact nature (Pashkova & Kuzemina, 2022).

3. Methodology

The study was conducted using comparative and other general scientific methods of inquiry. Issues concerning the characteristics of the green transformation process, as an opportunity for a transition to the noosphere - which is considered a new paradigm of human development - are examined in the context of rethinking and reassessing certain

aspects of the logic underlying the two concepts. Taking into account various features of the implementation of green transformation and the formation of a noospheric worldview allows these processes to be considered as interconnected, while also considering the prospects for their realization.

4. Green transformation as a process: Part of building a noospheric society

The concept of the noosphere, which proposes a pathway for human development through the transformation of the biosphere under the influence of rational human activity - essentially forming the basis for the green agenda - developed rapidly during the 20th century. Despite critical evaluations regarding the ambiguity and contradictions in the interpretation of the term “noosphere” and the feasibility of implementing its principles in social reality, it is important to note that it provided substantial empirical material on the biosphere and the multifaceted human activity, which cannot be considered apart from the dynamic process of ecologicalization and the “green” agenda. The noospheric worldview proposed by space-oriented scientists can help to more accurately and comprehensively reflect the mode of existence of contemporary humans within the complex socio-natural system, where “green development” standards imply harmonious interaction between humans and nature.

The practical contours of the noosphere concept were largely shaped by the adoption of the Sustainable Development Strategy at the UNCED (United Nations Conference on Environment and Development) in Rio de Janeiro in 1992, which forms the foundation for establishing a fair model of societal development. Fundamental principles of the noosphere have been embodied in various projects, such as the Earth Charter Initiative, aimed at sustainable development, environmental preservation and fostering harmonious relationships between humans and nature. Certain principles of the green agenda - such as biodiversity conservation, responsible consumption and production - align with the ideas of the noosphere, providing a basis for rethinking humanity’s relationship to planetary life and its ecological role (Prodanova *et al.*, 2024).

“Green development” (growth of green biomass in the biosphere) is a necessary component of sustainable development. As a new paradigm for long-term development, it emphasizes the sustainable use of resources and minimizing negative environmental impacts. As a transformative force, it creates new opportunities for humanity. The “green” transition in economic activity fits within the sustainable development strategy and initiates a new socio-natural mode of interaction (Ursul & Ursul, 2012). This form of societal-nature interaction, known as the noospheric approach, characterizes the emergence of global governance, including political dimensions, with noospheric contours (Ilyin *et al.*, 2012). Green development plays a key role in the formation of the noosphere, closely connected to ecological consciousness, which helps humans establish harmonious relations with nature.

Thus, green development can serve as a pathway for transitioning the biosphere into the noosphere. The noosphere, as a new state of the biosphere, represents an integration of natural laws with socio-economic principles of societal development through green development, which is reflected in various practical projects. Achieving this requires understanding the extent to which current green development practices can minimize anthropogenic impacts on the environment while effectively meeting the growing demands of contemporary societies for sustainable global development. Ecologicalization

remains essential, as current growth models continue to deplete natural resources and undermine ecosystem services.

The green transformation process depends on multiple factors, including diverse forms and levels of regional, interregional and transregional interactions, as well as emerging global environmental narratives aimed at achieving sustainable development and reducing negative impacts on natural ecosystems. By opening new opportunities for green transformation, stakeholders can not only initiate favorable environmental impacts but also develop new forms of relationships aimed at creating a “sustainable world order” or “ecological civilization” (Arran, 2022).

The proposed vision of the future - an ecological civilization - is based on understanding life as a form of coexistence and co-creation between human and biotic communities. It implies a rethinking of humanity’s role in nature and its contribution to the principles of a new global ecosystem, in which a characteristic model of human behavior and forms of interaction are established. Several countries actively pursue green development pathways and consumption models, accelerating the adoption of green technologies and large-scale environmental projects, thus progressively forming national and regional green transformation models. New green strategies must be aligned with national security priorities and sustainable socio-economic development, addressing not only climate change but also other UN Sustainable Development Goals, which create conditions for altering established patterns of activity.

Green transformation, as a complex and long-term process, largely depends on effectively addressing global challenges, particularly mitigating the negative effects of globalization, while balancing social and economic concerns with environmental preservation. Despite skepticism among some experts regarding the proposed transformation model and its perception by various societal groups (Khaynatskaya, 2023) and despite being “a challenge to current prosperity, it remains a necessary condition” (Yurgens & Romov, 2023) for future development, it is driven by the increasing anthropogenic impact on the environment. In the current context of global ecosystem degradation, humanity urgently requires the most advanced scenario for forming a sustainable and safe energy-ecological state for the planet.

It should be noted that the implementation of new strategies and development models is affected by rising conflicts, violations of fundamental principles of international cooperation and other contemporary challenges, which may further narrow opportunities for environmental governance and accelerate the breakdown of societal foundations. The ongoing competition for leadership in establishing new technological systems imposes additional requirements on the implementation of green development and ecologicalization. These factors collectively demonstrate the vulnerability and fragility of the global environmental protection system in the face of diverse ecological problems and contemporary challenges.

This trend, now at the forefront of the international agenda, compels modern states to implement and specify new ecological imperatives “as a condition for the further development of humanity” (Malyagin, 2015). It emphasizes the need for a new sustainable world order and a safe habitat, which cannot be achieved without effective green and sustainable development. In this context, green development addresses not only environmental but also economic, social and technological challenges. The process of green transformation may incorporate principles of the noosphere, particularly the “noosphere-technological development pathway”, implying that technological innovations in industrial production should aim to preserve the biosphere in a way that

ensures both human ecological safety and the economic efficiency of productive activity (Suhorukova *et al.*, 2018). For example, the growing use of innovative technologies reduces environmental impact, minimizes waste and promotes recycling. Investments in these technologies, both at national and regional levels, can foster environmentally sustainable solutions and contribute to a cleaner and healthier future.

However, practical implementation of the green agenda reveals that the emerging environmental governance system in the process of green transformation will exhibit fragmentation due to multiple factors. Expected changes resulting from the green agenda may not always occur as planned and may have significant consequences (Asadov & Asadov, 2022). Institutional challenges and socio-economic development issues may create coordination, financing and management difficulties involving stakeholders. Accordingly, the existing governance system must actively adapt to growing demands and new complex and contradictory political and socio-economic realities, where ensuring safety and improving quality of life remain especially relevant (Asadov *et al.*, 2025). The future state of ecosystems will depend on whether states and supranational actors, using new eco-oriented strategies and innovative green technologies, can effectively minimize the impact of these factors and become centers ensuring the survival of both individuals and civilizations. Many aspects of this issue underscore the importance of transitioning to a new strategy for humanity's survival and development, based in part on the ideas of the noosphere.

5. Conclusion

Thus, the increasing scale of anthropogenic pressure on the environment and its growing influence on ecosystems create clear prerequisites for the disruption of biospheric balance, which may lead to irreversible processes. Against this backdrop, humanity's efforts to create the most favorable conditions and a sustainable model of human-nature interaction become particularly important, aiming to form an ideal type of society, partly based on the noospheric concept of humanity's future.

In the complex process of developing this societal model, not only technological progress and other dynamic global phenomena are significant - whose consequences demand the search for the most effective models for environmental preservation and responsible stewardship - but also the formation of planetary ecological consciousness, closely linked to the noosphere, its ideals and values. Proper understanding of these values in the context of new realities will allow their qualitative application in the process of green transformation, as well as in the reorganization of existing patterns of activity.

The concept of "green development" and the construction of a noospheric society are closely interconnected through the ideas of sustainable development and the rationalization of relationships among humans, society and the environment. The prospects for creating a solid foundation for this new type of activity - primarily grounded in ecological standards - will largely depend on the influence of economic, social, geopolitical and other factors, as well as on the successful implementation of green transformation. The systemic integrity of this activity, which increasingly emphasizes green transformation, presupposes a new knowledge system that includes concepts, principles, technologies and pathways for the formation of a new development model.

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