

ЕКОНОМІКА ПРИРОДОКОРИСТУВАННЯ ТА ОХОРОНИ НАВКОЛИШНЬОГО СЕРЕДОВИЩА

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INTELLECTUAL CONTENT OF GREEN GROWTH IN CONDITIONS OF SUSTAINABLE DEVELOPMENT

The article is devoted to the analysis of the essence of the intellectual content of green growth in the framework of the global course of mankind for sustainable development. The gradual transition in scientific works from information economy and knowledge economy to intellectual economy, which is characterized by directing human intellectual activity to environmentally friendly activities aimed at achieving global goals of sustainable development, has been analyzed. It has been noted that the intellectual economy is the foundation of green growth and the importance of knowledge, skills, theoretical and practical competencies, creativity, which act as a driver of development of green sectors of the economy has been highlighted. It has been determined that there are nine types of human capital, of which the intellectual plays a leading role at the present stage of development of socio-economic processes. In the conditions of building a green economy, capital acquires green features, which is manifested through green intellectual capital, the main components of which are green human capital, green organizational capital and green relational capital. The interaction of green human and green organizational capital forms green relational capital, which is expressed in the form of green jobs, inclusiveness and gender equality. It has been noted that in the long run the development of green intellectual capital leads to the effect of decoupling, which is manifested in the gap between indicators of economic prosperity and environmental degradation. That is why strategies for the development of green intellectual capital should be the basis for the development of countries around the world to achieve global goals of sustainable development in terms of green growth.

Keywords: green economy, sustainable development, green growth, intellectual content, intellectual economy, intellectualization, decoupling.

JEL classification: F01, F29, I29, I31, O10

ІНТЕЛЕКТУАЛЬНИЙ КОНТЕНТ ЗЕЛЕНОГО ЗРОСТАННЯ В УМОВАХ СТАЛОГО РОЗВИТКУ

Стаття присвячена аналізу сутності інтелектуального контенту зеленого зростання в рамках глобального курсу людства на сталий розвиток. Проаналізовано поступовий перехід у накових працях від інформаційної економіки та економіки знань до інтелектуальної економіки, яка характеризується скеровуванням інтелектуальної діяльності людини на екологоорієнтовні активності, які спрямовані на досягнення глобальних цілей сталого розвитку. Зазначено, що інтелектуальна економіка є фундаментом зеленого зростання і підкреслено важливість знань, навичок, теоретичних та практичних компетенцій, креативності, що виступають драйвером розвитку зелених секторів економіки. Визначено, що існує дев'ять типів людського капіталу, з яких саме інтелектуальний відіграє провідну роль на сучасному етапі розвитку соціально-економічних процесів. В умовах розбудови зеленої економіки капітал набуває зелених особливостей, що проявляється через зелений інтелектуальний капітал, основними складовими якого виступають зелений людський капітал, зелений організаційний капітал та зелений реляційний капітал. Зазначено, що основним драйвером розвитку зеленого інтелектуального капіталу є зелена освіта яка має два рівні прояву – особистісний та організаційний. На особистісному рівні формується зелений людський капітал, що проявляється у формі специфічних знань і навичок людей. На організаційному рівні формується зелений організаційний капітал, що проявляється у формі зеленого бізнесу, зелених інновацій та технологій. Взаємодія зеленого людського та зеленого організаційного капіталу формує зелений реляційний капітал, що виражається у формі зелених робочих місць, інклюзивності та гендерної рівності. В свою чергу розвинений зелений інтелектуальний капітал має реалізовуватись спираючись на досягнення Індустрії 4.0 та Індустрії 5.0 і капіталізуватись і поширюватись через глобальні зелені ланцюги вартості. Зазначено, що у довгостроковій перспективі розвиток зеленого інтелектуального капіталу призводить до ефекту декаплінгу, що проявляється у розриві між показниками економічного добробуту та екологічної деградації. Саме тому стратегії розвитку зеленого інтелектуального капіталу мають бути основою розвитку країн світу на шляху досягнення глобальних цілей сталого розвитку.

Ключові слова: зелена економіка, сталий розвиток, зелене зростання, інтелектуальний контент, інтелектуальна економіка, інтелектуалізація, декаплінг.

Problem statement. Nowadays, in the context of green economy, which is formed through green growth and green policy, the issue of identifying key drivers of green growth in order to form effective strategies for green development is becoming relevant. In recent decades, the role of intellectual capital has significantly increased, which in the context of achieving global goals of sustainable development acquires new conceptual forms, which are based on environmental orientation. That is why the study of the role of intellectual capital in the development of a green economy, as well as its essence and functional interdependencies of structural elements is an important task of modern economics.

Analysis of recent research and publications. The predominance of knowledge and information approach to understanding the essence of the productive forces of society has led to the establishment of the information economy, the basic postulates of which are revealed in the works of A. Toffler [1], W. Martin [2], T. Stonier [3], Y. Masuda [4], M. Castells [5], N. Stehr [6], K. Kelly [7]. The information economy was considered as a type of economic system in which the possibilities of social change and economic development are dependent on intangible values, namely information and opportunities for its use. Further intellectualization of scientific theories was considered in the works of P. Drucker [8], F. Machlup [9], and developed in the studies of modern scientists [10–14], which stated that the change in the direction of innovations and technologies from economically expansionary to ecological and environmental protection which characterizes the transition to an intellectual economy in terms of green economy and sustainable development.

However, despite the significant achievements of scientists, there is still no single approach to determining the intellectual content of green growth, its structure, elements, content and functional interdependencies.

The purpose of the article is to study the essence of the intellectual content of green growth in the course of humanity to achieve global goals of sustainable development.

Results. According to O. Sabden [15], *intellectual economy* is a type of economic system based on knowledge of the laws of development of material nature and society, which should be aimed at the development of human potential, which should ensure the economic and social well-being of mankind while minimizing the destruction of planetary ecosystems due to man-made transformations and in the long run to improve the level and quality of life. Intellectual economy is the basis of green growth, which is characterized by the intellectualization of production cycles and can be considered as main content of green growth.

In the conditions of post-industrialism and intellectual economy, the main driver of economic development is human capital. Thus, according to P. Bourdieu [16], there are 9 types of human capital – economic, cultural, human, social, administrative, political, symbolic, physical and intellectual. Nowadays the leading role is played by intellectual capital, which consists of unique abilities, skills and knowledge that are directly used in production processes. The measurement of this type of capital is the level of highly educated population, the number of research and design institutions and the results of their activities in the form of patents and trademarks [16].

It is important that the development of human intellectual capital requires the presence of developed social capital, which is characterized by the rules of social relations, aimed at coordinating the actions of all members of society to achieve strategic goals [16]. That is, intellectual capital must be consistent with social capital, which together leads to the development of a harmonious personality, which has a high level of intelligence and is able to direct its work to achieve the global sustainable development goals.

In the current course to green economy, it becomes obvious that a necessary condition for achieving the goals and objectives should be the formation of appropriate intellectual and social capital, which will form the basis of green growth. Organizational business structures are also undergoing significant intellectualization. In the course of the green economy, most economic entities are transformed towards green business, the foundation of which

is new knowledge systems, environmental management, green operational processes, environmental corporate culture. That is why green intellectual capital is a set of both human resources and superstructures in the form of social connections and business organizations.

Thus, taking into account current trends, intellectual capital is transformed into *green intellectual capital*, the main components of which are green human capital (GHC) (knowledge, skills, experience, creativity of people who aim to protect the environment), green organizational capital (GOC) (a set of organizational solutions, management systems, IT systems and databases, operational processes, corporate culture that operate to reconcile the economic and environmental components of society) and green relational capital (GRC) social relations, law, culture, business communications, which are aimed at the development of environmental innovations) [17–21]. Taking into account the peculiarities of the components of green intellectual capital, it is possible to determine that it should be formed and developed at different levels on the basis of *green education* as a fundamental basis of green intellectual capital (Figure 1).

Green education must shape the environmental consciousness of people, which will be the basis of green human capital. Green consciousness can be manifested at the personal level – everyday life, attitudes to global environmental issues, contribution to the support and protection of ecosystems, and at the economic and organizational level – the formation, organization and development of environmental business, green organizations and events, green public policy. management.

The organizational level of the manifestation of green consciousness forms a green organizational capital, the result of which should be green organizations, green innovations and technologies that are based on the achievements of the circular and bioeconomy. At the same time,

the human capital should be used through the implementation of the policy of gender equality and inclusiveness. The combination of green consciousness and green business makes it possible to establish sustainable green relationships in society, which are expressed in the formation and development of green relational capital.

That is why it is possible to conclude that the green economy is intellectually oriented and should be based on the achievements of the intellectual economy, which is a type of economic system based on intellectual human capital, which in terms of informatization and digitalization uses knowledge to ensure social growth, well-being and protection of the environment. The main products of the intellectual economy are specific knowledge and various forms of information products, which form the basis of innovative economy, circular and bioeconomy within which green innovations arise. Understanding that the premise of green innovation, biotechnology and waste-free production cycles is a set of knowledge that catalyzes the development of innovation processes in green sectors of the economy and thus act as a driver of green growth, makes it possible to argue about the intellectual content of green economy.

Understanding knowledge as the main resource for the competitiveness of economies and the factor of green growth suggests that it is the intangible sphere of the economy that is key to achieving social welfare. This assumption is confirmed by the development of the tertiary, quaternary and quinary sectors of the economy in the global transition to a post-industrial economy [22]. That is why information, IT products and highly qualified services should form the basis of the green sectors of the economy while relying on the results of the scientific and technological revolution.

Today, humanity is within the framework of the fourth industrial revolution "Industry 4.0", which began in the

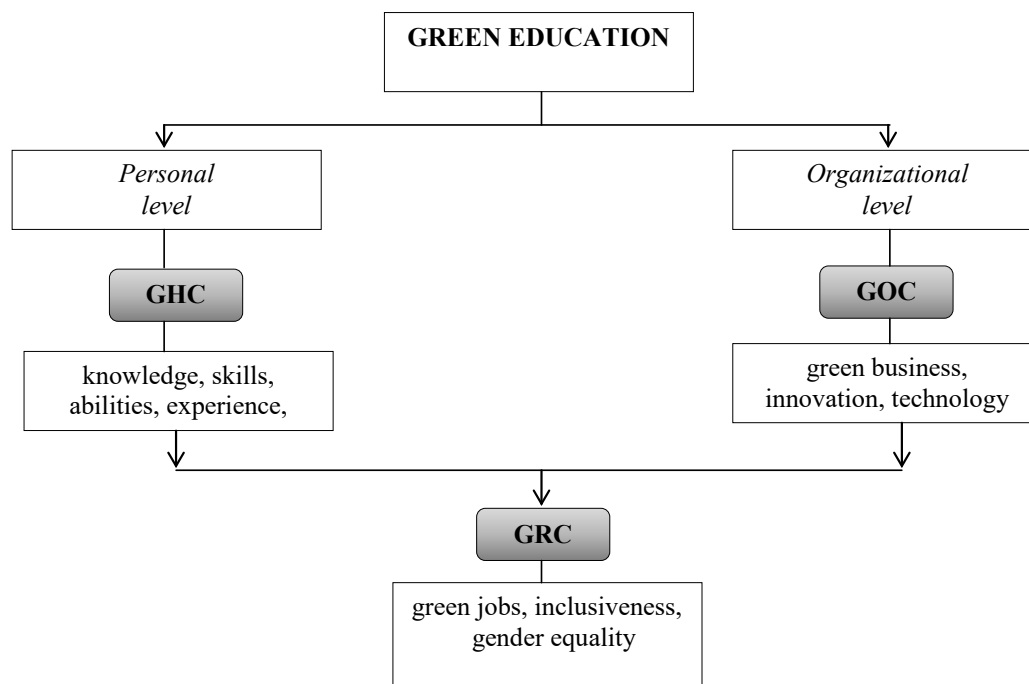


Figure 1. Levels of realization of green intellectual capital based on green education

Source: formed by the authors

middle of the twentieth century and was characterized by intensive intellectual activity, which was aimed at developments in the field of artificial intelligence, biotechnology, genetic engineering, information products. The main achievements are cyber-physical systems (CFS), Internet of Things, augmented reality, simulation technologies, autonomous robotics, Internet services, cloud technologies, integration systems, cyber security, additive manufacturing [23]. At the same time, most scientists claim [24] that today there is the transition to the fifth industrial revolution "Industry 5.0", which aims to solve the global food problem, ensure sustainable agriculture, production of safe food and goods of household purposes, highlights the use of renewable resources in industry and the development of energy based on biomass. That is the basis of the fifth industrial revolution which are also the main drivers of green sectors of the economy, which are intellectually rich and human-centered.

In the context of these transformations, it is important to note that some scientists [25] predict a crisis of social welfare, which is associated with the displacement of people from production cycles and the replacement of labor with mechanized one. Moreover, due to the rapid development of robotics and artificial intelligence it is replacing not only the physical qualities of people, but also skills and knowledge. All this increases the role of highly skilled labor, creativity and personal qualities that can not be replaced by machines and involves reforming the education system towards highly intelligent specialties and professions of the creative sector of the economy, which should be the foundation of green sectors.

Moreover, in the context of globalization and internationalization, it is important to understand that the development of economic sectors, which was previously limited by territorial boundaries and features of the state system, now goes beyond one territory, which manifests itself in the form of fragmentation of production processes across national borders [26]. This phenomenon is considered as the global value chains (GVC), which are a chain of successive stages, the purpose of which is to manufacture the final product, and each stage can occur not only in different types of enterprises, but also in different countries. In modern conditions, an important task is the "greening" of

global value chains, which should be implemented in the following areas:

- ensuring sustainable use of natural resources and increasing the share of renewable and recycled resources at the stage of entering the value chain;
- maximization of material and energy efficiency at each stage of the process;
- minimization of negative impact on the environment as a result of all stages of the value chain.

That is why green global value chains (GGVC) should be the basis of green growth, which should be formed by highly qualified staff and receive government support in the form of appropriate green policies. At the same time, an important task within green growth is to achieve the effect of *decoupling*, which is manifested in the inverse dependence of economic growth on the harmful effects on the environment and the use of natural resources. That is, as the level of economic growth increases, the indicators of the negative impact should decrease or remain unchanged.

For the first time, the essence of the economic category "decoupling" was revealed in the report "Indicators for measuring the effect of decoupling environmental pressure from economic growth" of the Organization for Economic Cooperation and Development, which stated that achieving the effect of decoupling is a strategic goal. Accordingly, decoupling is one of the main characteristics of green growth, which shows an increase in socio-economic well-being while reducing the pressure on the environment.

Conclusions. The green economy is formed on the foundation of the intellectual economy, which is manifested in the intellectualization of green growth. Intellectual content is characterized by increasing role of intellectual human capital and in terms of sustainable development is expressed in the form of green intellectual capital. The key driver of green growth is green education, which is formed at the personal and organizational level and forms green human and green organizational capital, which in turn in functional interaction generate green relational capital. The development of green intellectual capital should be based on the achievements of Industry 4.0 and Industry 5.0 as well as spread globally through green global value chains, which in the long run should lead to the effect of decoupling.

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