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## Well-being Paradigm in the Context of Green Economy and Information Society

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### Abstract

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It was determined the necessity of the searching for a new paradigm of social and economic development in order to ensure the well-being without negative impact on environment. The social well-being factors connected with green economy development were analysed. It was concluded that the role of technology and technological changes increases, and technologies predominant over other development factors. Analysis of biotechnologies, information and cognitive technologies was carried out in the context of qualitative changes. It is noted that modern technologies focus on human abilities, intelligence and information. Components and working objects of information technologies were determined. The main virtual economy components were studied. The interaction between the virtual economy development and the social well-being was demonstrated. Conducted research results proved, that Russia needs the transition to new economic system, which will contribute to the preservation of natural resources. The authors propose new paradigm of social well-being as such economic system in the context of green economy and information society development. The authors note that human abilities, intellect and information are primary for modern technologies, machinery is paled into insignificance. It was concluded that, on the one hand, modern technologies and their forms could be good for society in the efficient and purposeful use. On the other hand, they will be dangerous if the use of technologies is inefficient.

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**Keywords:** Green economy; virtual economy; bioeconomy; society's well-being; information technology.

### 1. Introduction

The current economic system leads to natural resource reduction, global food price increase, worsening of the situation of the population living below the poverty line, and creates enormous risks and challenges for the future generations. The imbalance between the population living below the



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poverty line and increasing wealth of a small percentage of the population requires some changes in lifestyle and thinking.

### *1.1 Problem Statement*

The Chairman of the Government of the Russian Federation, D.A. Medvedev, mentioned that "new development paradigm which is able to ensure the social well-being, without excessive negative influence on nature" is required. (Bobylev, S.(Eds.), 2013) According to the authors of the study, one of these paradigms is the green economy, as a phenomenon related to modern development stage of society is in the conceptual discussion. The global green new deal and its institutional framework must ensure the well-being of the entire population, including the present and future generations. It is obvious that the resource efficiency improvement does not guarantee stability or positive impact on the ecosystems, in this regard, it is important to focus on resource efficiency and sustainability in order to achieve environmental sustainability. In addition, the twofold aim towards resource efficiency improvement and the maintenance of ecosystem resilience, involving integration with the social aspect, or human well-being, is fundamental, given the vital importance of basic resources presented by water, food and energy as the ecosystem services for daily needs.

### *1.2 Research Questions*

The modern green economy development stage involves implementation of some elements and tools, but there is no systematic approach to the phenomenon, that interfere transition to the "greening" of the country economy, and also in the global scale to enhance mankind well-being as a whole.

According to the present theories of technological development, Russian and foreign authors duly conclude that the role of technology and technological changes is increased. In recent years, a technological determinism or the predominance of technology over other development factors has become the research subject.

Partial replacement of natural resources (non-renewable) for renewable energy sources, the basic technology convergence of the sixth technological way lead to the appearance and active use of "green" technologies, resulting in green economy development. Today, green economy is considered as a new development paradigm. The authors, applying systematization of theoretical and methodological approaches to the content of "green economy", attempt the following definition: green economy is an economy system associated with production, distribution and consumption of goods and services based on the impact on resources from technological changes, which lead to improved human well-being in the long term, without exposing humanity including future generations, and to significant environmental risks, and ecological scarcity.

The emerging challenges of the modern stage require the search for new development paradigms, which have become an integral part of high-quality technological changes. This is due to modern trends of science and technology development.

The modern concept (theory) of technological determinism draws attention of economists and politicians to radical technological changes, which present overcome crisis factor and launch a trajectory of economic recovery. The basis should be the nanotechnology progress and the convergence

with biological, information and cognitive technologies (NBIC-convergence ). (Roco, Mihail C. and Bainbridge, William Sims, eds., 2002). Presented technologies, except for the cognitive, are scientific and technological development priorities in Russia («New Materials and Nanotechnologies», «Biotechnologies», «Information and Communication Technologies»). So it should be noted their study is relevant and timely.

### *1.3 Purpose of the Study*

Following the logic of this paper, the analysis of biotechnologies, information and cognitive technologies in the context of qualitative changes was conducted.

Global penetration of biotechnologies in the economy was reflected in the formation of the conceptual system. The concept of bioeconomy as "an economy based on the use of biotechnology, renewable biological raw materials" was introduced. At the same time, in addition to the concept of bioeconomy a number of terms denoting its branches (Table 1).

**Table 1** Branches of Bioeconomy

Biotechnology	Sector of economy
White biotechnology	Industrial production
Red biotechnology	Pharmaceutical production and medicine
Green biotechnology	Agriculture and animal production
Blue biotechnology	Aquaculture and mariculture

## **2. Research Methods**

The theoretical basis of the study was formed by the scientific works of Russian and foreign researchers in the field of technological development, their forms and qualitative changes, the role in the economy development, its new models, as well as work involving trends in the green economy development in the information society. In conducting the study, the authors use the provisions set out in official documents of the Russian Government, affecting the directions of technology development. The scientific research methods of economic phenomena provided methodological base of the study. The unity of the historical and logical method was applied to the research questions. Research methods included comparative, structural and functional analysis, economic and mathematical, evolutionary methods. The classification and grouping were used in the study.

## **3. Results**

Analysis of biotechnologies shows that this type of technologies has the systematization by economic sectors. As a result such systematization introduces white, red, green, blue biotechnologies. Based on this approach the qualitative technology changes form new trends not only within sectors, and contribute to new types of economies such as bioeconomy, green economy.

The main bioeconomy components are development and implementation of genomic, post-genomic and complex cellular technologies to produce new products and processes, to use renewable biomass

for sustainable production and environmental protection, the integration of biotechnological knowledge and applications in various economy sectors.

Using both biotechnologies and nanotechnologies raises some concerns in society on the following factors:

- a) use of human cells and tissues;
- b) use of personal and genetic data;
- c) problem of «fuel from crops is a threat to food security»;
- d) excessive use of biomass in the third world (environmental aspect);
- e) animal cloning.

It should be noted that modern technologies give priorities to human abilities, intelligence and information, technique is overtaken by a focus. The logic of the paper is justified to study information technologies.

Information technologies include the Internet, telecommunications, television and telecommunications, artificial intelligence and others. These technologies according to O.S. Sukharev make up a virtual technologies group, the impact of which is directed to an immaterial object or resource, such as information, knowledge and management (Sukharev O.S. ,2014)

As L. Myasnikova pointed out, today in the United States approximately 45 million people used as the capital goods only intelligence, backed by a personal computer (Myasnikova L. ,2006).

Virtual technologies mostly are widely used, because they cover a large number of people become common technologies like consumer goods. So it is an important change in the modern economy, where earlier technologies were the subject of industrial applications and were studied by specialists in specific engineering fields, concerned the specific technology sections. Now a lot of agents become armed technologically, and technologies such as the Internet are not expensive for these agents, and allow them to search and process information independently and with high productivity.

Internet as a global information system, produce cyberspace and then cyberculture with its concepts, values, ways of thinking and language and today it is one of the main virtual economy components. As A.V.Abeltsev notes in the publication «The concept of the «virtual economy» and its characteristic features»: «The core of the economy virtualization is that economic phenomena are initially formed in the mind, not in reality, and the new information technologies make mental effects more stronger to transfer their interaction in the real world to an extent that, in fact, the two economies are formed: the «real» and «artificial», where economic reality is presented in the form of some information instructions, sometimes not determined at all by the state and trends of the «real economy» (Abeltsev A.V., 2002).

Information technologies like nanotechnologies, biotechnologies are dangerous for society. They increase the amount of information, which leads to pointless attempts to control it. The result could be so rapid and complex technical progress that it will be impossible to understand and manage it for the population.

The interaction of nano -, bio - and information technologies contribute to the emergence of interdisciplinary areas such as computational biology, bioinformatics, systems biology and others. Thus, summarizing technological changes under the current conditions, it is necessary to determine the

qualitative changes as technology convergence form. At the same time the principles of interaction between technologies and science are changing, reflecting the phenomenon of technical science.

A view of the «doomsday scenario nanotechnology» is expressed by K. Eric Drexler in his book «Engines of Creation» (Chernikova I.V., Chernikova D.V.,2010) he described out-of-control self-replicating nanorobots (assemblers), which convert the entire biomass in the «grey goo». This could also include the technological singularity, which is projected in 2027-2030. As a whole the effects of artificial changes in the human nature and the cognitive apparatus determine an issue which affected not only the sphere of self-knowledge, but self-development and self-preservation.

#### **4. Conclusions**

The study concluded that Russia needs a transition to a new economic system that will contribute to natural resource conservation. The authors proposed a new paradigm as required system of social well-being in the context of green economy under the information society development. The analysis of bio -, information and cognitive technologies was carried out in the context of qualitative changes, which are relevant to the modern development stage of society. It was noted that modern technologies focus on human abilities, intelligence and information, technique is on the back burner. The interaction of nano -, bio - and information technologies contributes to the emergence of interdisciplinary areas such as computational biology, bioinformatics, systems biology and others. Summarizing technological changes under the current conditions, it was determined the qualitative changes as technology convergence form. At the same time the principles of interaction of the system of science and technology are changing. In addition, modern technologies and their forms could bring both important benefits and threats and dangers to society if the technologies are not managed well.

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