
CONTEMPORARY PROBLEMS OF DEVELOPMENT

DOI: 10.20542/0131-2227-2022-66-11-92-100

THE COLLAPSE OF THE GLOBAL CONSUMPTION MODEL: IN SEARCH OF SUSTAINABILITY

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Received 10.07.2022. Revised 25.07.2022. Accepted 22.08.2022.

Acknowledgements. The article has been supported by a grant of the Russian Foundation for Basic Research (RFBR). Project No. 20-010-00981.

Abstract. New “climate change reality” is transforming the goals that were the most important two or three years ago. During the last few years, the EU, U.S., China, Japan and many other countries established new plans to achieve carbon neutrality by 2050–2060s. These new goals and plans towards achieving carbon neutrality and greening national economies require a fundamental change in consumption patterns. The growth in demand leads to an increase in consumption, which, in turn, stimulates an increase in production and the volume of resources involved (energy, minerals, land, water, etc.). One of the most important indicators of the global consumption model is decoupling, which means the growth of the economy without corresponding rise of environmental pressure and resource consumption. Although there were some signs of the decoupling effect in the developed countries during the previous two decades, it was not achieved on the global scale during that period. Moreover, by 2060s, the resource consumption of the world economy may escalate significantly. At the global level, the growth of consumption in developed countries can lead to an overall increase in the impact on the planet’s biosphere. This impact relates to the “export” of environmental costs from developed countries to developing ones, which can be clearly observed on the example of the greenhouse gas emissions indicator. The same pattern manifests itself as an increase in the UN Planetary pressures—adjusted Human Development Index. The general trend is: the higher the level of human development – the greater the index of the planetary pressure. Finally, the transition of mankind to sustainable development requires a profound transformation of consumption patterns due to the impossibility to maintain high environmentally intensive consumption standards for the next generations, based on the accomplished technological level, traditional economic model and established institutions.

Keywords: sustainable development, consumption patterns, Sustainable Development Goals, carbon footprint, global environmental impact.

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КРАХ ГЛОБАЛЬНОЙ МОДЕЛИ ПОТРЕБЛЕНИЯ: В ПОИСКАХ УСТОЙЧИВОСТИ

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Статья поступила 10.07.2022. После доработки 25.07.2022. Принята к печати 22.08.2022.

Аннотация. Статья посвящена анализу необходимости трансформации мировой экономики в направлении экологических и климатических приоритетов в контексте сложившейся в мире неустойчивой модели потребления и складывающейся принципиально новой эколого-экономической нормальности. Переход человечества к устойчивому развитию требует радикального изменения такой модели из-за невозможности в будущем на основе сформировавшегося типа экономики (а) сохранить высокие природоёмкие стандарты потребления для следующих поколений в развитых странах, (б) достигнуть высоких уровней такого потребления следующими поколениями бедных стран и стран с трансформирующейся экономикой.

Ключевые слова: устойчивое развитие, модели потребления, цели устойчивого развития, углеродный след, глобальное экологическое воздействие.

Благодарность. Исследование выполнено при финансовой поддержке РФФИ в рамках научного проекта № 20-010-00981.

INTRODUCTION

The “new reality”, which came into the world with *COVID-19*, has overshadowed another phenomenon, perhaps even more important for the long-term prospects of human civilization – the development of new environmental and economic normality. This phenomenon is associated, first of all, with the fact that the world’s leading economies have officially adopted the long-term goal of achieving carbon neutrality, assuming that an economy’s emissions of greenhouse gases do not exceed the volume of their absorption. Here one can highlight the EU, the USA, China, Japan, and other countries with advanced economies that plan to achieve carbon neutrality by 2050–2060 [1; sources 1, 2, 3, 4]. Russia also has its benchmarks in the field of low-carbon development: the implementation of the target scenario envisaged in the Strategy for the Socio-Economic Development of the Russian Federation with Low Greenhouse Gas Emissions implies the achievement of carbon neutrality by 2060 [sources 5, 6].

Climate restrictions change and transform the goals that were most important for humanity and individual countries two or three years ago: the growth of GDP, material wealth, income, employment, etc. All these goals must now be implemented within the strict framework of the environmental and climate agenda. These principles are no longer just slogans. Hundreds of billions of euros, dollars, and yuan have been invested in the new environmental and economic course, and strict economic and legal regulatory mechanisms have been adopted.

The conceptual foundations for the development of the economy, and its economic and legal mechanisms are changing at both global and country levels. This change is not a dream of the “greens”, but a hard necessity. This is clearly seen by the example of the World Economic Forum in Davos, which brings together the economic elite of the world, presidents, prime ministers, Nobel Prize winners, leading economists of the world, billionaires, bankers, etc. In the Davos Forum Report, even in the context of a global pandemic in January 2022, the first three of the 10 most serious global risks identified by experts in the next decade were environmental ones [source 7, p. 14].

The Nobel Prize winner in economics, Amartya Sen, emphasized the current environmental instability of human civilization: “Humanity is not trying to ensure the sustainability of the natural world, it is trying to ensure sustainability for itself. If we cannot put the world around us in order, we will have to ‘leave’. The fragility of nature is our weak point, the source of our instability” [2].

It is clear that the new environmental and economic normality and the international focus on achieving carbon neutrality and greening, in general, require deep understanding and a dramatic change in consumption patterns. Thus, one can assume the end of the epoch of “civilization of maximization” focused on uncontrolled growth in consumption, production, and financial indicators [3]. Correspondingly, the search for new opportunities in transforming modern social, environmental, and economic development is underway. The results of this search include pro-

posed formulations for replacing the model of traditional capitalism with “stakeholder capitalism” for sustainable value creation, brought forward within the framework of the already mentioned World Economic Forum in 2020 [source 8, p. 25]. Currently, the criteria of *environmental, social, and corporate governance (ESG)* are rapidly developing at the level of companies and corporations, giving important social and environmental information to investors and buyers. In this context, one can recall the works by scholars from the National Research Institute of World Economy and International Relations of the Russian Academy of Sciences in the field of corporate citizenship and social responsibility in the early 2000s [4].

The transition to sustainable development should be recognized as a general conceptual direction of global transformation. Sustainable development is actually recognized as the paradigm of human development in the 21st century. This is confirmed by the internationally recognized decisions and documents of three UN conferences [sources 9, 10, 11]. This paper is an attempt to investigate the underexplored issues of the transformation of global consumption in the context of tightening environmental and economic restrictions and the transition to sustainable development. In the classical definition proposed by the Brundtland Commission, sustainable development is defined as development making it possible to satisfy the current needs without jeopardizing the needs of future generations [source 12]. Thus, already in the very definition of sustainable development, the topic of consumption is in the spotlight. However, the issues of the essence of current needs, the degree of their rationality, and trends in the needs of rich and poor countries give rise to more and more discussions [5, p. 21].

GROWTH OF THE GLOBAL ENVIRONMENTAL IMPACT

The feeling of a threshold, a bifurcation point passed by humanity, is reflected in many international documents and research papers. The 30th UN Global Human Development Report *The Next Frontier: Human Development and the Anthropocene* (2020) is indicative in this respect. The ecological load on the biosphere has been growing exponentially over the last 100 years, which has brought the Earth to the brink of the abyss [source 13]. This growth indicates that the Earth is entering a new geological epoch, the Anthropocene, or human epoch, and in this epoch, humans themselves are the dominant risk to

their own survival. The task of the new frontier for humanity is to minimize and eliminate planetary superloads and return to the ecological limits (capacity) of the biosphere. An important conclusion of the report is also the identification of new risks associated with environmental degradation. In particular, the COVID-19 pandemic can be a response to the pressure exerted on the planet by humankind through the destruction of traditional ecosystem links and the reduction of biodiversity. In general, the fundamental statement of the Report on the planet’s entry into the Anthropocene is in sync with Vernadsky’s ideas about humanity as a powerful geological force producing global changes on the planet [6].

Currently, the tasks of mitigating environmental distortions through the transition to sustainable development are accompanied by the development in theory and implementation in economic practice of new economic concepts – the “green” economy, low-carbon economy, closed-loop economy, and “blue” economy. The implementation of these concepts, in fact, is an attempt to reduce the negative impact on the environment as a result of traditional economic growth based on the consumption of resources.

In this context, the toolkit of positive feedback (more broadly, feedback loops) proposed by Dennis and Donella Meadows and their colleagues in the most quoted scientific book of the second half of the 20th century, *The Limits to Growth* [7], is illustrative. (By the way, 2022 marks the 50th anniversary of its publication). Later, this toolkit was widely used in the world for building global forecasts and development models. Positive feedback reinforces related processes; they “stimulate” each other. Relying on nearly 40 years of modeling experience, Donella Meadows writes: “Positive feedback loops are sources of growth, explosion, erosion, and collapse of systems. A system with an uncontrolled positive feedback loop will eventually destroy itself” [8]. The negative effects of positive feedback loops are clearly visible through the example of the interaction of three processes in the current global development model. An increase in demand leads to an increase in consumption, which in turn promotes an increase in production and the volume of resources involved (energy, fossil fuels, land, water, etc.). Feedbacks are constantly “self-reinforced”, which leads to unstable development.

Currently, humanity has formed a development system with an uncontrolled positive feedback loop, and the established consumption and production models are destabilizing it even more [source 14, pp. 48-49]. Dramatic consumption-related 4.6-fold

growth of world GDP in the last three decades contributed to the improvement of living standards of hundreds of millions of people. However, this growth was achieved largely due to the depletion of natural capital and the degradation of natural ecosystems. The growth of global GDP was accompanied by the aggravation of global ecological problems. It should be noted that the climate problem emphasized by developed countries is most likely a medium- and long-term one. The water apocalypse is much closer in time; when hundreds of millions of people simply will not have water for drinking, it will cause catastrophic migration consequences for the world. Already today, about 4 billion people (60% of the world population) live in regions with an almost constant shortage of water, and by 2050, 6 billion people may face a shortage of clean water [source 15].

One can identify several indicators of environmental limits (restrictions) that cannot be exceeded by humankind. A generally recognized indicator of ecological limits is the indicator of changes in global temperature. According to the Paris climate agreement, its increase in the 21st century should not exceed 1.5–2 °C, while if the traditional development track perseveres, the temperature on the planet will increase by 3–5 °C [source 16, p. 13]. Already now, calculations based on the indicator of ecological footprint developed by Wackernagel and colleagues [9] show that the global economy needs 1.6–1.7 of a planet like Earth to provide the current level of consumption and needs in natural resources and ecosystem restoration as a result of environmental pollution and greenhouse gas emissions. From the perspective of the total consumption of inhabitants of the planet, to reach the level of consumption of an average American, the world population would need five Earths. If the existing negative environmental and economic tendencies will persevere, the volume of

use of natural resources, pollution and emissions of greenhouse gases in the next half century will increase substantially. If such tendencies continue, they can have catastrophic consequences both for all humankind and for individual countries.

INDICATORS OF CHANGING CONSUMPTION PATTERNS

The most important effect reflecting changes in the global consumption model is decoupling. This term has recently become commonplace among scientists and politicians, and international organizations pay a great deal of attention to it. Decoupling is a key factor in the formation of a sustainable green economy. Decoupling as a misalignment between the growth of people's well-being and the use of material resources is aimed at a relative reduction in the amount of resources spent on production and consumption. The so-called dematerialization of economic growth and welfare growth is achieved. Decoupling greatly contributes to the “unlocking” of positive feedback loops, or at least softens the rigidity of these loops.

A certain formalization was introduced in the process of measuring sustainability in the field of consumption by the UN Agenda 2030, which formulated 17 Sustainable Development Goals (SDGs), 169 targets, and over 230 agreed global indicators [source 17]. SDG 12, “Sustainable Consumption and Production Patterns”, is a new goal included in the “Agenda 2030”, which has no analogs of implementation within the framework of other international documents, in particular, the UN Millennium Development Goals (2000–2015). SDG 12 has global, cross-country, cross-sectoral, and cross-industry characteristics.

Table 1. Sustainable development goal (SDG) No. 12, targets, indicators

Targets of SDG 12	Indicators	World	Russia
1. Rational and efficient use of natural resources	Domestic consumption of materials, billion tons	91.88 (2017)	2.43 (2017)
	Domestic consumption of materials per capita, ton/person	12.17	16.86
	Domestic consumption of materials per unit of GDP, kg/USD	1.16	1.39
2. Halving food losses per capita by 2030, including during consumption, production, and sales	Food loss index, %	13.8 (2016)	
3. Rational use of chemicals. Waste reduction throughout the entire product life cycle	Generation of hazardous production and consumption waste, million tons	81.26 (China 2019)	100.59 (2019)
	Electronic waste, million tons	53.60 (2019)	1.6 (2019)
4. Reducing waste by reducing generation, increasing recycling and reuse	Recycled and neutralized production and consumption waste, % of generation		50.1 (2019)

Source: [sources 19, 20, 21].

SDG 12 includes 8 main and 3 additional targets, and also 12 global agreed indicators to control and monitor the achievement of the purpose [source 18]. Four of the targets are aimed at the efficient use of natural resources and waste reduction, and the remaining targets contain tools for transition to sustainable consumption and production patterns, such as action strategies for countries, companies, public procurement, monitoring of sustainable tourism, and the withdrawal of fossil fuel subsidies.

Table 1 presents some important, in the authors' opinion, indicators for assessing the transition to rational consumption and production patterns in the Russian context in comparison with global indicators.

The trend of growing demand for resources is expected to persevere in the context of the current technogenic development. According to the forecasts of the Organization for Economic Cooperation and Development (OECD), material-intensive sectors of the economy will significantly increase by 2060: industry – 3.2-fold; construction – 2.6-fold; agriculture – 1.8-fold [source 22]. The volume of recycling and return of waste into economic turnover will also increase (3.7-fold) on the basis of the development of a closed-loop economy. However, in the world economy, the share of secondary use will still be 10 percent of the share of primary resource extraction if the current trends persevere.

According to the same data, the use of material resources in the world will more than double by 2060. The increase in the consumption of metals and non-metallic minerals may be particularly significant: 2.5- and 2.3-fold, respectively. Thus, not only will resource shortages in the economy increase but also environmental impacts, pollution, and waste volumes.

WHO IS TO BLAME?

Until recently, there was an illusion that an increase in wealth based on traditional consumption patterns would, at some point, reduce the burden on the environment. In other terms, it would be possible to reduce the dependence on positive feedback loops between the growth of material prosperity and consumption, on the one hand, and the increase in ecological impact, on the other. This is closely associated with both the growing awareness of the environmental component of quality of life and the transformation of economies and production under the influence of this awareness. Decoupling in developed countries also supports the hope for this course of events. In theory, the relationship between

an increase in prosperity and a decrease in the environmental burden has been called the environmental Kuznets curve. According to this curve, in the first stages of economic development, the growth of well-being leads to an increase in the environmental load, but with the growth of awareness of the importance of the environmental component of the quality of life, an “inflection” of the curve occurs, and further growth of well-being is accompanied by a decrease in the impact on nature [source 23].

However, recently the exacerbation of many global environmental problems has raised doubts about the full correspondence of the Kuznets curve to real processes: its pattern, perhaps correct at the national level, may not work at the global level. An increase in prosperity and a reduction in environmental impact in many developed countries promote imports of products and raw materials from developing and emerging countries. In turn, the production of goods in these countries is often accompanied by significant externalities and environmental damage. The example of China as the “workshop of the world” is vivid evidence of this; in this country, economic progress has been achieved at enormous environmental and health costs. Thus, at the global level, increased prosperity in developed countries can lead to increased impacts on the planet's biosphere.

Such “export” of environmental costs is clearly observed by the example of the indicator of greenhouse gas emissions, which is key in the transition to a sustainable low-carbon economy. If imports are included in domestic consumption, the “carbon footprint” grows, and the difference between emissions from domestic consumption and production can be significant (Table 2). This is an important indicator showing the impact of individual countries on the climate system through their own emissions and imported products. In other words, quantitatively it reflects net emissions (net export/import) as the difference in national emissions and emissions outside the country's territory, produced in other countries for export production and consumption by importers. In the authors' opinion, this is a more correct indicator for the purpose of determining the environmental impact of consumption in different countries. According to the OECD, the world's largest emitters, the BRICS countries (China, India, and Russia), despite their own significant greenhouse gas emissions, exported a significant part of carbon-intensive products mainly to developed countries (Table 2). In this regard, the responsibility for CO₂ emissions is also borne by the importer. For Russia and China, the indicator of net export of emissions as a percentage of their emis-

Table 2. Comparison of greenhouse gas emissions from production and consumption in individual countries, CO_2

	Emissions from production		Emissions from consumption		Net emissions (net exports of emissions)	
	mln tons CO_2	% of the world volume	mln tons CO_2	% of the world volume	mln tons CO_2	% of the world volume
OECD, total	12 204	37.8	13 781	42.7	-1581	-13.0
USA	5020	15.6	5795	18.0	-785	-15.6
France	312	1.0	445	1.4	-132	-42.2
Germany	766	2.4	853	2.6	-85	-11.0
United Kingdom	431	1.3	576	1.8	-143	-33.1
Japan	1202	3.7	1361	4.2	-158	-13.2
Sweden	44	0.1	70	0.2	-26	-59.9
China	9281	28.8	7978	24.7	1309	14.1
Russia	1488	4.6	1168	3.6	321	21.6
India	2043	6.3	1919	5.9	124	6.1

Calculated by the authors based on: [sources 24, 25].

sions is 22% and 14%, respectively, while for OECD countries, this value is negative and equals -13%; for example, the United Kingdom (-33%) and France (-42%) should be noted.

The limitations of the Kuznets curve at the global level are also demonstrated by comparing the globally and nationally recognized UN *Human Development Index* (HDI). The HDI is a measure of a country's development, consisting of sub-indices of life expectancy, the level of education of the population, and the level of material prosperity, defined as gross national income per capita. In the 2020 *Human Development Report*, the UN adjusted the HDI taking into account the *Planetary Pressures-Adjusted Human Development Index* (PHDI), which accounts for the levels of resource inputs and CO_2 emissions per capita in different countries (see Fig.). In this and other UN reports, the high prosperity of developed nations was identified as a key environmental stressor [source 14].

The figure shows that, in general, an increase in the HDI accompanies an increase in the level of planetary pressures, and this trend is characteristic of states with different levels of economic development and population sizes. Thus, the higher the level of human development, the more "developed" a country, the greater the planetary pressures and their scale. It is evident that, along with traditional economic development indicators, one should take into account the environmental and carbon footprint in order to determine the "environmental" price of well-being and responsibility for the degradation of the biosphere.

The current situation in the world raises violent debates about the countries' responsibility for their environmental impact. The classic question is: Who is to blame? Those states that are the main produc-

ers of pollution and consumers of natural resources, supplying a significant part of their products for export, or those that consume, import nature-intensive products, but do not produce them within their national boundaries? Obviously, the global balance of the use of environmental resources and the distribution of current consumption should take into account this disproportionality.

Due to the need for a radical change in global consumption patterns, the environmental consequences of the growing consumption in developed rich countries and the growing consumption gap with developing poor countries raise concerns. This environmental impact and inequality are important factors in the unsustainability of global development. The rapid growth of consumption is also promoted by the growing prosperity of countries that were not rich until recently. China is a striking example, where in a short time hundreds of millions of people have moved into the middle class with increasing material demands.

Further expansion of the scale of consumption on the established technological basis within the traditional market model can become environmentally destructive, exacerbating poverty and inequality.

In the theoretical context, from the perspective of the need for a transition to sustainable development, one can talk about only insignificant internalization of some temporal (between generations) and global (between countries) externalities generated by the developed countries' consumption [10]. Obviously, the expenses of the rich for such internalization of externalities in the world should be much higher. This will become a modified implementation of the "polluter

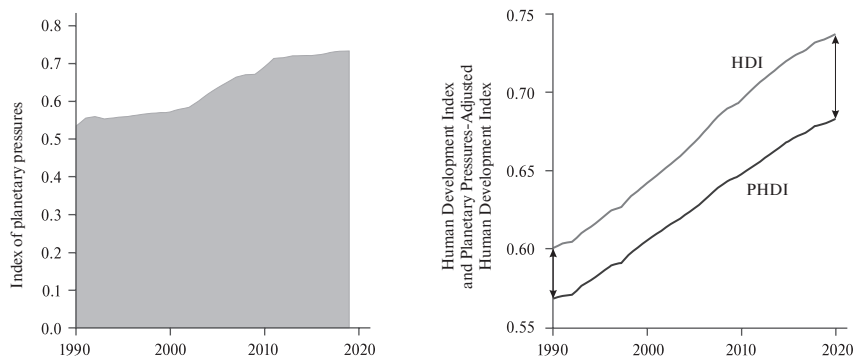


Fig. HDI, PHDI, and planetary pressures.

Source: [source 13, p. 238].

pays” principle enshrined in the legislation of many countries.

One can also note the decoupling effect within almost all developed countries, based on the misalignment between the trends of growing prosperity and consumption, on the one hand, and the reduction in environmental pollution and consumption of natural resources, on the other. However, such decoupling is based on the growth of global (planetary) environmental pressures.

In the context of the new geopolitical reality that has been taking shape since the beginning of 2022, the issue of consumption (overconsumption) is taking on a new meaning. At the international level, there is growing tension about access to and distribution of energy, food, and mineral resources. New policies in the area of the efficient use of resources are emerging in importing countries. On the one hand, there are examples from the past when the energy crisis of the 1970s promoted energy efficiency and the development of new technologies in the field of renewable resources. One can thus assume that the new geopolitical reality will promote more efficient approaches to consumption. On the other hand, the rapid growth of developing countries and countries with transforming economies, taking into account the population’s orientation toward modern standards of consumption, can only increase environmental degradation and destabilization of the biosphere.

To transform the standards of “overconsumption”, it is important to change people’s consciousness and established stereotypes of consumption and cultural traditions. These issues are beyond the scope of this paper, but responsible consumption approaches are currently being developed in the world. These approaches are associated with the environmentally oriented behavior of people and changes in consumption patterns: the desire to buy environment-friendly

goods, the rejection of non-ecological goods and services, compliance with environmental standards in everyday life and at work, sharing, etc. [source 26].

CONCLUSION

The formation of a new environmental and economic reality is closely correlated with the transformation of the world economy in the direction of sustainable development, prioritizing environmental and climate goals. All the world’s leading economies, including Russia, have adopted the achievement of carbon neutrality as their main long-term goal by 2050–2060. This orientation requires a radical change in the established production and consumption patterns. These models currently support a system of unsustainable development with an uncontrolled positive feedback loop and destabilize it even further, leading to a growing excess of the environmental capacity of the biosphere.

Until very recently, the predominant theory was that the growth of consumption-based prosperity from a certain threshold point would be accompanied by a decrease in the burden on the environment. The decoupling effect observed in most developed countries also contributes to the reduction of the environmental impact at the national level. However, at the global level, the regularities of the environmental Kuznets curve fail to function properly, which manifests itself in a constant increase in the total planetary pressures. Carbon and environmental footprint indicators show that rich nations, while minimizing greenhouse gas emissions within their national borders, maintain their high consumption standards by importing environmentally intensive goods and services from less developed and poorer countries.

Thus, humanity faces an unsolvable problem, when on the basis of the established technological

level, the traditional economic model and institutions, it is impossible: a) to maintain the established consumption model and its level for the next generations in developed countries, b) to achieve high levels of consumption by the next generations in poor countries and countries with transforming economies. This is objectively conditioned by the limited environmental capacity of the Earth, its planetary boundaries. This is a dead-end path for humanity. It is evident that the most important law of the development of civilization is the transformation and “fitting” of the growth of consumption and well-being into the limited capacity of the biosphere.

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