TOWARDS A GLOBAL SUSTAINABLE FUTURE

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Sustainable development is seen as a global resolution strategy socionatural contradiction between the growing needs of humanity and limited natural resources. This scenario seems to be an exit from the global ecological crisis and treated as a global control system balanced on social and natural development.

Key Words: demographic sustainability, evolutionary approach, environmental safety, global processes, global sustainability, interdisciplinary research, national security, security, social and natural contradiction, sustainable development.

Introductory remarks

In this century, there may, and even must, occur a cardinal turn in human history, whose importance can hardly be compared with all previous revolutionary changes of the past. We mean the transition to sustainable development as a new form and highway of civilizational process. This transition will occur, albeit with great difficulty, as a quite conscious choice of all mankind — or, in any case, of those peoples and states which form the United Nations.

The meaning of impending turn of history is to save humanity from possible annihilation, from threatening and impending disasters caused not by some external reasons, but by the previous and current development of civilization. It is this development where there is a hidden "mechanism", leading to a rapid or slow self-destruction of mankind, the details of which will be discussed in this monograph.

The concept of the survival of humanity as a strategy for sustainable development (SD) is known to have been formulated by the International Commission on Environment and Development in the book "Our Common Future", published in English and several other languages in 1987 (the Russian translation was published in 1989) [*Our Common Future*, 1989]. The official adoption of the concept and strategy for sustainable development took place at the UN Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992. It is the UNCED where state leaders and heads of governments of 179 countries — members of the UN realized that all the achievements of civilization are under the threat of extinction if the environmental issues and some other global problems are not solved. After all, all mankind may be plunged into the abyss of anthropoecological disaster, since ecological conditions, resources and other riches of nature, and its ability to repair itself came to the verge

of exhaustion.

The transition to sustainable development, as recommended by the United Nations, began in 2005, and this "beginning" will persist at least through 2014. This decade of the beginning of transition to sustainable development implies the completion by the UN member countries of the period of understanding the need for such transition and the beginning of the practical actions by the countries of the international community aimed at building our common sustainable future. The UN political ideas and recommendations must turn into real strategies and social norms and relations of each state as regards managing the transition to a new model of development of the entire civilization. Let us note the important specifics of the idea of sustainable development — it was offered on a supranational, global political level, rather than in a single country or by an individual scientist.

Therefore, an issue arises that was attempted to be solved at the UNCED: how to save humanity from its supposed annihilation, and what has to be done to this end? It turned out that for our civilization to survive, one needs to radically change the model (form) of development of humanity, its interaction with nature and even the very way of life of the population of our planet. It is necessary to carry out such transformations which, perhaps, would be the most fundamental ones in the history of civilization, and which would ensure the survival of humanity and its transition to a new form (model) of development and existence. But is it possible at all? After all, the concept of sustainable development is not yet a practically proven scientific theory, but rather a certain world outlook, political idea and recommendation. Scientists will have to clarify and substantiate or reject it, as it is done now by some of them without proper justification, often on the basis of purely subjective considerations.

In our opinion, the documents first adopted at UNCED and later at other international forums on sustainable development under the auspices of the United Nations are "informational materials" that have an ideological and conceptual basis, a "soft" regulatory and strategic orientation, socio-political recommendations and a source of future norms governing the transition to sustainable development. Until recently, when considering the issues of sustainable development, major attention was paid to their conceptual and strategic content. And in this paper, we will not evade these aspects of the problem of sustainable development, but we will focus our attention on political and strategic issues of the discussed theme. These issues have only begun to be examined, and they now represent the greatest interest; moreover, here as well the emphasis will be laid on the scientific side of the examined issues.

It is clear why philosophical and conceptual-strategic issues turned out to be more attractive at the initial stage of comprehension of the issue of sustainable development. After all, it was necessary to first understand what sustainable development constitutes as a form of further civilizational existence and progress, because it turned out to be essentially new. This form of civilizational development was neither predicted, nor developed by any sufficiently popular school (theory) of social science. The reason for this is that the humanities scientists saw the future in the "format" of the model of non-sustainable development, wherein the existence of mankind was implicitly assumed to be eternal. And it was one of the major misconceptions of the past, and to a large extent, also the modern social sciences and the humanities, which has been mostly abstracting from nature.

It turns out that it was necessary to pay close attention to environmental issues, to understand the impossibility of mankind's existence in conditions of a dangerous and unstable model (shape) of modern civilization process. It was a kind of eco-futurist "collapse" of all social science or, at least, the part that was "responsible" for the explanation of the event essence and somehow tried to look into the near future.

Here we should recognize the nonlinear nature of the development of the latter part of the socio-humanitarian knowledge. Much of what social studies has "tried and tested" appeared of little use for adequate vision of the future in the way of the survival of mankind. And the idea itself of a sustainable future appeared only because we had to pay attention to the environmental issues of surrounding environment of society, i.e. escape from the social world in the socio-natural dimension that was not the case for the main part of the socio-humanitarian knowledge. In addition, this transition to the wider system of life and, consequently, a broader view of the future development of mankind has led to a radically new idea of the evolution of civilization. We can say that in our minds there have been dramatic transformations, a kind of nonlinear transition to an alternative traditional, to the "different future" than that previously represented to the majority of social scientists.

In the very idea of development, which in the social and socio-natural areas has become a concept of sustainable development, "nonlinear thinking" has been appeared. In the issue of sustainable development, the future is on focus. In the model of non-sustainable development, approach to the study of the future was largely "linear": the future was derived from the past and the present, which suggests traditionally understanding of historical approach. Meanwhile, in the awareness of the issue of sustainable development there will be a shift of emphasis from the study of the past and the present to the future. This process makes sense to call futurization (from Lat. Futurum — the future), which is designed to restore the temporal integrity of scientific knowledge.

Real transition to sustainable development will begin only when the proper form of evolution will gradually be included (and increasingly replace it) into a real political and other socio-cultural normative systems, including morality and even religion, in spite of its great commitment to the traditional model of development. The concept of sustainable development is actually a synonym of more "normal" development, where such a level of security of planetary social and natural system is reached, which ensures the survival of mankind and its indefinitely long existence. In the model of non-sustainable development, mechanism of the "normal" functioning of society has mainly local (spot) and short-term nature, and the model itself is generally a dangerous and unstable environment for the further existence of man and mankind.

If this environment (natural and human) of the existence of man and society would have been more secure, then it would being reduced, or there even would not be need in the regulatory and protective equipment, and the system would have been more open, thereby contributing to further progressive development of civilization. It is obvious that these means, in principle, shall not be discarded, as there will always be risks and negative impacts on society and the people from which we have to defend. However, part of the internal threats, which depends on the human factor, can be changed, and more supportive, safe socio-cultural environment of living and development could be created, that suggests the transition to sustainable development.

Until now, there were no approaches to measuring of the extent and probability of survival of mankind. Now, due to the formation of concepts and strategies for sustainable development, we can assume that the extent civilization will move from the modern model to sustainable development model will be the same as the extent of increasing of the probability of survival. Assuming that such a transition would fully satisfy the survival of mankind, the probability (rate) of survival can be expressed in terms of reduction of anthropogenic pressure on the biosphere, on that drew the attention A.P. Fedotov [*Fedotov,* 2003] (there are other approaches to the measurement of the degree of transition to the sustainable development [*Ursul, Demidov*, 2006: pp. 67-86]).

Awareness of the immanent relationship of development and security, and in the long term of the "security-development" system has led to the formulation of opportunity of security provision through the development, and to be more precise, through sustainable development. In addition, this idea was proposed in 1995 [*Ursul,* 1995]. Formation of a more secure human environment and civilization as a whole in the process of transition to sustainable development means that a substantial part of the security functions can be provided is no longer protection, but this very new more normal i.e. sustainable type of development, which will reduce the amount, scope and intensity of negative and harmful influences. Protective security mechanism in this case is no longer the primary and is transformed into additional security and its legal and regulatory systems means through sustainable development. The first such regulator- legal awareness occurred when a decree No. 537 "On the National Security Strategy of the Russian Federation to 2020" was signed [Website of the Security Council], which approved this Strategy and repealed previous editions (1997 and 2000) of the National Security Concept. The adoption of this Strategy, which for brevity we will refer as Strategy-2020, is essential for the consolidation of the efforts of state and society in the field of national security and further socio-economic development of Russia in the long term.

In the Strategy-2020 is decided to put in its basis the fundamental methodological status of the relationship and interdependence of the sustainable development of the country (and the society) and national security (especially in Articles 2 and 3 of The Strategy-2020). Therefore, if the "Concept of transition of the Russian Federation to Sustainable Development", approved by Presidential Decree in 1996, had mainly environmental "focus", now in connection with the adoption of Strategy-2020, perhaps we can state the new vision of sustainable development issues through "prism" of security issues, and above all, national security. It was the first time for the reason that to date has been developed conceptual and theoretical foundations of the vision of sustainable development from the perspective of security issues as well as security through sustainable development. Let us make a point that Strategy-2020 is not only a National Security Strategy, but also a new one, "safe" version of the Russian concept of transition to sustainable development in the vision of this development from the perspective of security of both our country and the entire world community. We believe that this is an important ideological and conceptual- methodological turn in the awareness of security issues and in the field of sustainable development issues, their combining into a single scientific-search and practical-activity directions.

We call attention to the fact that regulatory support for formation of more secure wide system as an environment of human and mankind existence requires changes

of the social and socio-natural essence of human activity itself. In the modern model, this activity has the economocentric nature and a man is guided by the principles of self-interest and benefits that are far from the issues of mankind survival. This process in the society, in any case, at the global level, leads to the spontaneous interaction of these often competing interests that are opposing the survival of all mankind (which was not noticed by F. von Hayek, as will be discussed further).

This discrepancy of vectors of individual survival and the survival of the human race, which is now constantly striving to anthropoecological disaster, creates a dangerous environment of existence and development of so-called model of non-sustainable development. One of the tasks of the transition to sustainable development is just the creation of a unified strategy for survival, in which the personal and national interests to the necessary extent coincide with the interests of the survival of all mankind. After all, if individual and corporate interests continue to be opposite to the vector of survival of all mankind, it will just irreversibly degraded, and eventually die in a rapidly impending planetary-system crash.

If the model of non-sustainable development focused attention on a separate "economized" person, then the model of sustainable development focuses on the whole of mankind, the survival of the latter as a whole, and not just, for example, the "golden billion". It became apparent that not only the rights and freedoms, but also an individual's life could not be maintained in the future if the entire sphere of human habitation degrades and breaks down, not only its social, but also the natural environment. That is why the new model of civilization development is more humane in its strategic and political orientation.

The idea of connection of strategies for the future security of Russia and its transition to sustainable development comes from the fact that the security of "non-sustainable development", the model of which is still being implemented in Russia (and throughout the world as a whole), is impossible in principle. Transition to sustainable development involves safety ensuring in all respects, and the Global Security is also being implemented in the way of sustainable development. Such a close relationship of universal (and global) security of the country (and the world community), and sustainable development provides strategic novelty and specificity of further human existence.

As a methodological basis of such vision, all the means to explore the future should be used, including forecasting, futurology and systemic approaches, determining the specific issue of the survival of mankind as a further provision of security for civilization through sustainable development.

In recent years, a number of scientists described the future of civilization as a society of not only new opportunities and horizons, but also as society of risk, dangers, crises and global disasters. This feeling of endangered mankind and global threats intensified after the acts of international terrorism in the United States of September 11, 2001 and subsequent terrorist attacks in various parts of the globe, that per global media caused great psychological resonance, a sense of fear and terror in the hundreds of millions of people.

Globalization is not only formation of the unity and growth of the integrity of civilization, the emergence of some new goods in the international community, but also the formation of a historically new threats and dangers of global character. As a reaction to westernization strategy of globalization development, standardization and

universalization, nationalism and separatism are revived; international terrorism is obtaining the planetary scale, becoming one of the most serious threats to progressive movement of the international community. This is not only a radical anti-globalization, but also the "shadow" or a kind of "alternative" globalization, when the Euro-Atlantic direction of globalization is opposed the fundamentalist ideology and strategy of "holy war", reflecting the hopelessness of the situation in the modern world of billions of starving beggars, sick, illiterate, doomed to remain without a future, which the "golden billion" seeks to privatize just for yourself.

Security issues at the beginning of the XXI century take on a special significance for each country, for each person, for the whole world community. For example, in the "Charter of European Security", adopted November 19, 1999 in Istanbul, at the OSCE summit, it was declared, that the Heads of states and governments express their firm commitment to the formation of a free, democratic and more united the OSCE region, where the states parties coexist in peace with one another in conditions of freedom, prosperity and security. Security not only in Europe, but also throughout the world has become even the main criterion of human existence in its broadest sense.

Becomingthenewbenchmarkandaprioritycriterionfortheeffectivenessofallareas of human activity, safety is understood not only more widely and comprehensively, but also starts a new sink in, becoming value clearly understood by all mankind. Many universal values of the XX century are appeared to be less important than the values associated with security, and therefore among the values of the XXI century, and of all the III millennium, security will be, in the opinion of the authors, the most important value. After all, security is associated with the possibility of human life and mankind, its save, and not only for the present generation, but also future, as well as for the biosphere as a whole.

It was in the last decade of the second millennium when the civilization faced an issue of global survival. It is primarily concerned with the protection of the challenges, threats and hazards to the survival and development of the mankind. The greatest danger to civilization are those that accompany the development of global issues, and the latter are known to be the result of social and economic progress in its traditional and spontaneous, and as is now clear, deform-dehumanized form. Because different planetary dangers may lead the mankind to a particular disaster even in the coming decades, it is clear that security provision in all its aspects is a priority of any social activity.

It is the issue of security, in particular the environmental safety, that necessitated at the beginning of the third millennium the change of direction (strategy, shape, pattern) of development, as lasting from the time of the Neolithic revolution traditional spontaneous development has no longer ensured the survival of mankind. This new situation in world development, that from the synergetic point of view appeared to face the bifurcation, reflected in modern science, which is not only due to internal logic, but mainly under the influence of external factors has to start changing of the direction of its development. This change is necessary not only to explain the course of the history of society and its interaction with nature, but also mainly in order to predict the future and create the most effective means of survival of mankind, to identify ways and principles to overcome the deep anthropoecological crisis, in which civilization was by the end of the XX-XXI centuries.

The transition to a new form of development of civilization (which is still only exists in the form of political declarations and credentials of the UN) was caused by the reasons mainly related to the environment and security provision in the broadest sense. If the international community fails to realize the transition to sustainable development, even in this century the socio-ecological catastrophe of a planetary scale or another could break, related to the above-mentioned threats. XXI century can be the century of global transition to sustainable development, and thus the survival of civilization, and the preservation of the biosphere as a natural foundation of human life.

To mankind to survive, we need to transform radically the process of development, changing human values and orientations of the translational motion, since they were formed in the non-sustainable development model — UDM (at UNCED in Rio de Janeiro was named that form of development, in which our civilization still continues to develop). None, even the most highly developed country (and especially the developing world) would not be able to go on the path of sustainable development without changing the mechanisms of development fundamentally, not choosing new targets of its national development and security, which have been identified in the "Agenda for the XXI Century "(1992),"Plan of Implementation of the WSSD" in Johannesburg in 2002, the outcome document of the Rio + 20 "The future we want", and other official documents of the United Nations. And this is required from all other countries of the world community the transition to a new strategy for SD, that is no longer modernization-overtaking, but transformational-anticipatory, and only thanks to which it will be possible to ensure the survival and security of all mankind, and not just some part of it, tending to privatize the future to the detriment of the rest of the world's population.

Global threats and negative trends of socio-ecological, socio-economic and socio-political nature exacerbate global issues and negatives of globalization, create new adverse global trends and increase the risk of further movement to planetary anthropoecological catastrophe. That is why it is important to be united in a common resolve to make determined efforts to respond positively to the need to prepare to deal with global challenges, especially environmental issues.

Inconsistency of the expected socio-economic development of the rotation at the beginning of the new millennium is apparent. One, a traditional model of development in which we are moving by inertia (no longer in the direction of universal progress), threatens planetary omnicide. The second model of sustainable development still exists only at the conceptual and theoretical level and is basically a political declaration and strategic programs at the global, regional, national and local levels. This virtual, but not yet implemented reality creates a lot of difficulties and challenges for the current generation, that is clearly by the overwhelming majority does not want to share the benefits with the future generations of the world's population. Strategic objectives of changing the course conflict with policy, tactics and specific behaviour of the existing authorities and peoples of the world, who think about the future in the face of a narrow circle of their representatives (mostly scientists). A sustainable future will not appear without a struggle with an unstable present and past. In this is the controversy and drama of the XXI century, which, depending on the resolution of this conflict, would be a century of transition to a sustainable future of mankind, or the end of its history in the truest sense of the word.

For UNCED, WSSD, Rio + 20 and all their documents the fact in common, that they are still largely on the political and strategic levels just declare the model (in principle — the variety of models) of sustainable development, the contours of which even in concept form are not defined enough clearly. We intuitively and at the level of common sense only partly understand that such development in many ways, as mankind is still moving on the way of "progress", is no longer possible, otherwise it will be no future. All considerations of this sustainable future is much more and mostly cosmetic "woven" in the now-functioning model of development than in the abstract desired, but still virtual-theoretical "reality" of a sustainable future. Therefore, all our scenarios of the future are "transition" — a mixture of non-sustainable development model and our conceptual aspirations for the future, which nevertheless still quite vague and is little argued (especially by science). And only with the implementation of UN documents: "Agenda for the XXI Century", " Plan of WSSD Decisions Implementation", "The future we want", it will become clear if we start to move away from the global catastrophe impending to our descendants and to approach the next "brighter future"(now globally sustainable), or all our hopes will be the same utopian, as previously declared variants of the desired future.

The specifics of any state and their coalitions transition to sustainable development is, in particular, in equating the priorities of the global and national development on the objectives and criteria that ensuring the survival of the entire world community, while maintaining the natural environment. In this sense, the emergence of the priorities and objectives of sustainable development shifts the national interests to global, but does not lead to a levelling of specificity, its own interests, goals, values, ideals, etc. This situation is typical for absolutely all the countries of the world community.

In this regard, the transition to sustainable development poses to Russia some new opportunities to integrate into the global transition process, but at the same time, initiates, especially from developed countries, dangers and threats of information-political, security and economic impacts. Under the guise of sustainable development from its external and internal opponents actions can and will be proposed, that clearly contradict to it, not to mention about the open opponents of this development strategy, clearly prefer the personal, group and corporate interests to the global interests of all mankind. Their opinion is also to a certain extent necessary to take into account, as there is no only one true and recognized by all concept, model and strategy for sustainable development.

Sustainable development is not just one of the new challenges, but the global super issue, on the solution of which depends the future of all mankind, its fate in the third millennium. This is a completely new form (model) of development of the entire international community that finds its way to its survival and solving of global issues of mankind. Sustainable development is an issue and a strategy for future development of civilization, through which "lenses" we can and shall see all challenges, including globalization, and security provision. This means the use of a new conceptual and methodological approach of the future, an advanced vision of civilization processes, designing the upcoming model of socio-natural processes.

The book authors offer advanced vision of the civilization development of the upcoming model of socio-natural processes. Security issue we are trying to comprehend in the context of a new vision for the future development of mankind, where security

will be provided by fundamentally new form (strategy) of development. Here, in fact we will talk about conceptual rethinking of what was otherwise considered by science in the model of non-sustainable development. The concept of sustainable development was first associated with the environment, but then it became clear that it was in fact a new form of development of mankind. However, the issue of environmental safety is an important issue on which the authors will still focus, referring to the global sustainability. Further development and understanding of the concept of security from the perspective of a global movement towards sustainability, its transformation into a major strategy for the existence and development of the civilization of the third millennium will change the outlook of people and help them to find a common future.

Socio-natural contradictions and the transition to sustainable development

In recent years, concept of sustainable development (SD) is more and more often and widely discussed in the society. We agree with the opinion of N.S. Kasimov that "perhaps no other scientific idea of any natural or social sciences did not have before such a wide public resonance" [*Kasimov*, 2004]. However, we are not inclined to clearly assume that the idea of SD has only a scientific nature; in fact, one might even say that this idea cannot yet be fully reasoned by science, at least that science that appeals only to the facts and practices.

After all, there is still no such a type of development on a global scale, and we just assume that it may appear in the future, if there will be adequate social and socio-natural transformations. Therefore the proof of the consistency of the idea of SD could be obtained only by future science, which we call, in contrast to the modern (to some extent in its avant-garde part, post-non-classical), noosphere science [*Ursul, Ursul,* 2004a; *Ursul, Ursul,* 2004b]. Although we already have in principle the study of the SD strategy and attempts of its argument [*Scientific Basis*, 2003; *Strategy*, 2002], and the first scientific foundations were laid by the report of the Brundtland Commission (WCED), "Our Common Future" [*Our Common Future*, 1989].

The reason of mentioned popularity of the idea of SD is not so much in its scientific merit and originality, but in the fact that this idea has gained recognition in the United Nations, now representing more than 190 countries worldwide. Adopted at the United Nations Conference on Environment and Development in Rio de Janeiro in 1992 (UNCED), confirmed at the World Summit on sustainable development in Johannesburg in 2002 (WSSD) and the UN Conference on Sustainable Development, again in Rio de Janeiro in 2012 (Rio + 20), SD strategy granted the status of political recommendations for all countries and peoples of the world. Science, of course, participated in the formulation of the main provisions of this strategy, as reflected in the instruments of referred UN forums, while the WSSD recommended all countries to begin the transition to SD from 2005. However, we must bear in mind, that modern science basically explores the non-sustainable development model (UDM) and actually (literally and figuratively) displays "our common past".

The basic idea of SD in overall civilizational perspective, in our view, is to save civilization and the biosphere. Therefore, in a sense, it seems not only conservative, but also an innovative idea. However, it differs significantly from the "traditional" conservatism (if it is appropriate to say so) and is to some extent the neoconservative and innovative outlook.

According to N.S. Kasimov and Y.L. Mazurov, "the provisions of the concept of SD, including the form in which they are reflected in the report of the Brundtland Commission, are not fundamentally new in human history. They were inherent to the traditional patriarchal society of past eras; they have being reproduced in the modern world order of aboriginal communities, such as indigenous minorities of the Russian North. Moreover, in fragmentary form, the imperatives of traditional SD are retained even in some developed countries that experiencing an industrial revolution, the effects of urbanization and other civilizational upheavals" [*Kasimov, Mazur,* 2004].

Among cited by them examples are as follows. In Germany, the principles of sustainable development began to be introduced in the management of the economy long before the report of the WCED. German term "Nachhaltigheit" (resistance) from XIX century entered into the practice of forestry in this country. Under sustainable forest that management understood, in which the removal of forest resources was necessarily accompanied by reforestation, fully compensating cutting volumes.

However, not only in the field of nature, but also in the sphere of ecology, especially American and British environmentalists used the term "sustainability" almost at the same meaning as modern in the concept of SD.

Yet purely etymological excursus on the concept of SD cannot give a complete picture of its essence. It is important, given the global nature of SD, to trace the formation of its understanding by the international community. Even in the report, "World Conservation Strategy" (1980), presented by the International Union for Conservation of Nature and Natural Resources, stressed that in order for development to be sustainable, it is necessary to consider not only its economic aspects, but also social and environmental factors. Especially widely in the 80's the development and environmental issues discussed in the writings of scholars of American Research Institute "Worldwatch", in particular, its director, Lester R. Brown [*Brown,* 1972; *Brown,* 1981] and the United Nations Environment Programme (UNEP) since the mid-70s widely used the term "development without destruction", and later used the concept of "eco-development" as an environmentally acceptable development, i.e. impacting the environment at the least negative level.

The Declaration of the first UN Conference on the Environment (Stockholm, 1972) also associated economic and social development with environmental issues. In such an understanding, the important contribution was made by the scientific reports of the Rome club, especially the report "The Limits to Growth" (1972), which formulated the idea of civilization transition from exponential economic growth to a state of "global dynamic equilibrium", from quantitative growth to the organic development and new world economic order.

In addition, although we started talking about the idea of forming of SD tendencies not from Russia, one can hardly agree that the concept of sustainable development first emerged in the West (sometimes refer to the book of Lester Brown) [*Brown,* 1981: pp. 24]. The origins of the idea of SD are of fundamentally international character. You can specify the works of Russian (Soviet) scientists who in one form or another expressed ideas close to the ideas of sustainable development. Most often the name of the VI Vernadsky is mentioned, who used even the phrase "sustainable global community," but the main thing, developed the idea of the noosphere, or sphere of mind, which is directly related to the concept of SD [*Ursul,* 1993].

Equally important, in our view, was the role of the founder of theoretical astronautics K.E. Tsiolkovsky, who, thinking about survival (saving) of the human race, not only offered the idea of extra-terrestrial habitation spaces, but also devised a means of implementing this idea, a space rocket. Although now a global world is becoming more integrated, but still limited earthly world of socio-natural interactions that influence and even determine all the other processes on our planet. The most obvious limitation is not only territorial; impose a limit on further extensive development, but also exhaustible natural resources, global environmental threat, etc. This and limitation of the temporal nature, often impose a limit on the development of various processes in the world, including the existence of mankind.

Eschatological themes abound in the pseudo-scientific, even the scientific literature, and the media. And global warming or alleged another Little Ice Age are not the only threat to the planet in the future. It is expected that the world is threatened by disasters, such as volcanic activity, as seismic activity increased and not only to the volcanoes may represent a danger, which many on the planet, but also supervolcanoes (there are more than two dozen supervolcanoes in the world). And of particular concern is Yellowstone supervolcano, located in the north of the United States, as well as asteroid-comet hazard that is gaining relevance. At these planetary restrictions and threats in the late XIX — early XX centuries drew attention K.E. Tsiolkovsky, who offered to fix them for humankind through the invention and use of the rocket as a vehicle for a wide space exploration. With the help of space exploration scientist proposed subsequent implementation of continuous progress of civilization, and thus ensuring the possible immortality of the human race. And, apart from the idea of preservation of the biosphere, it was one of the first versions of the concept of sustainable development, but in outer form, the implementation of which is not excluded in the distant future.

However, this more distant cosmic future may come, if we can solve our global issues and to secure the globalization process, sending it to the SD Highway [*Ursul,* 2004]. Now the priority is the solving of the issues of the biosphere, its preservation. Noosphere ideas of VI Vernadsky and social (space) immortality of K.E. Tsiolkovsky did not include focusing of human efforts at the preservation of biosphere. One spoke of the transformation of the biosphere into the noosphere, another considered development on the planet dangerous and ineffective, suggesting the idea of conservation and the survival of mankind in the spaces of the universe. However, now we clearly understand that the natural basis of SD is only conservation of the biosphere, the return to nature's "essence" as the foundation of survival and continued development of mankind. Authors, opposing the idea of SD, have a different point of view [*Nazaretyan,* 2004].

However, if the above ideas of VI Vernadsky and K.E. Tsiolkovsky was expressed mainly in the first half of XIX century, the second half of this century was marked by the emergence of ideas related to the rational ("the right" by A.D. Armand) nature management, driven primarily by Soviet scientists (V.A. Anuchin, A.D. Armand, J.K. Efremov, S.G. Strumilin, T.S. Khachaturov, etc.). For example, A.D. Armand believed that the moral duty of every generation is to leave the next generation the natural resources in the best condition and in greater numbers than it has received from the previous [*Armand,* 1964].

Of particular importance is the direction in the field of nature management, which in the 80's of XX century was developed in Moldova, and in the 90's, after the collapse

of the USSR, in Russia: the formation of scientific basis of the adaptive strategy of intensification of agricultural production. The expected intensification of agricultural production should use to a greater extent the adaptive properties of man and natural factors (biogenic and abiogenic), replacing by them unplayable (especially chemical-technological) resources. In fact, there was, basing on agriculture, formulated a scientific basis for what in the future will be called "stable (or noosphere) nature management", and was formulated methodological concept of an expanded understanding of the intensification as maximal involvement of qualitative factors and sources of activity while minimizing the quantitative parameters [*Zhuchenko, Ursul*, 1983].

One could continue to list other areas related to the environment and nature management, but only to these sources more systematic concept of SD cannot be reduced. If we look at the main components of the planned process of SD, we find that expressed in Marxist ideas of social justice can rightfully be attributed to one of the directions of the future concept of SD. These ideas (of course, without mentioning their authors) were included in the concept of SD, developing by the UN and especially by the former Secretary General Kofi Annan, and are considered perhaps the most important in the idea of SD, along with the issues of environmental safety.

In addition to the social aspect, it is important to note those works in the field of economics, which develop not extensive, namely intensive mode of production and of any economic activity, which is environment-friendly and economically fairer than the traditional market-economocentric model.

Here we should include socio-human developments, which is oriented to the study of trends that may in the future enter into the model of SD. In light of these studies, it is clear that, for example, in Russia there is a process of translational motion from the values of the totalitarian past through the market-democratic present to a sustainable future. Still all of these values are mixed into one "eclectic" formation, and it is important now to identify those universal global priorities that will support the process of transition to SD. It would seem that the preservation of mankind is a kind of conservative idea, but it requires a change in mankind itself, and the cardinal, in order to enable it to survive and exist indefinitely on the planet. This is the most fundamental transformation for the entire post-neolithic history of mankind, which are aimed at the preservation of mankind as well as the biosphere as a natural foundation of all life and intelligence in the world.

The presence of different directions to form a new shape of civilization development indicates that there are various contradictions in its present form (model). But from all the contradictions we do not accidentally allocate the contradiction between society and nature, which manifests, and more and more acute, as the contradiction between the growing needs of the world community and the inability of the biosphere to provide these needs [*The concept*, 1996]. Anyway, such a contradiction has always arisen, but it is only the second time it manifested at the global level. First time hunter-gatherer economy of fragmented by tribes of mankind gave way to producing economy, and for the second time, in the second half of XX — beginning of XXI century, when there is also need to change the very type of development of already relatively unified world community, and again globally.

During the transition to the Neolithic revolution, it was basically a lack of natural (food) resources that could not be mastered with the help of the Paleolithic methods

and extensive technology. Therefore, agricultural revolution was the formation of a new way of natural resources management in the food production (mostly of biological nature), that not previously existed in the natural form and able to meet the needs of the people that created the conditions for the population explosion.

The transition to SD, which in principle cannot be stretched for several thousand years as a transition to a productive economy, shall happen in a few decades (at most one or two centuries). This is due to the fact that to a lack of natural resources (primarily non-renewable) social and environmental crisis was added, the destruction of the biosphere as the natural foundations of life and civilization and any other life forms on the planet. Moreover, the degradation of the natural environment is more "weak link" in this crisis than the lack of natural resources, which in principle can be replaced by the creation of new high-tech and environment-friendly economic activities. This is the difference of the current global conflict in the "society — nature" from the Upper Paleolithic, which led to a change in the method of economic activity and wider to the interaction of the main components in said system.

Global issues (and their counterparts in the past), concentrating the negative consequences of the previous development of mankind, are the precursor and companion of dramatic turns in the history. Global contradictions arise and form when fundamental crises are brewing in the existence and evolution of homo sapiens, which leads to a change in method of socio-natural interactions and, thus, of being of the social stage of evolution. Historical examples in the past can reveal some analogues of the current global situation, where some, especially socio-natural, global development processes lead to the emergence of global conflicts and all sorts of complex human issues, and their solution generates new global processes [*Ursul,* 2013].

Humanity is not the first as well, but at least the second time in its history faced also with different, but still planetary-spatial and socio-natural contradictions and limitations of its ever-expanding business operations: the first time (in the Upper Paleolithic), and then in our time. However, we must see that it is the restrictions of a fundamentally different type of economic activity: in the first case — for hunting and gathering, and the second time — for the productive economy that can no longer be viewed as extensive, and to some extent the intensive activity in relation to the previous one. Geocentric restrictions for extensively growing productive economy suggest that global issues can be solved in the way of globalization as a new round of "planetary intensification", which calls for a transition to an intensely-innovative and at the same time co-evolutionary method of economic process and socio-natural interactions on a global scale.

Thus, the historical examples we find in the past, have some analogy to the contemporary global situation where certain, primarily socio-natural, global development processes lead to the emergence of global conflicts and all sorts of complex human issues, and their solution generates new global processes. Fundamental processes of formation of new ways of socio-natural interactions lead, albeit ambiguously, to the emergence of global conflicts, and their positive solution again gives rise to the development of new global phenomena, turning out at the same time the processes of global development. It is important to identify this evolutionary aspect of the global dynamics and, from process vision, to go to its evolutionary views [*Ilyin, Ursul,* 2009; *Ilyin, Ursul*, 2014].

It was under the influence of the era of production, when human activity began to think as an activity of people aimed at the change and transformation of the world [*Ogurtsov, Yudin,* 2000: p. 635]. Now it is necessary to make appropriate adjustments to the philosophical category of activities that should be understood not only in terms of transformation, but also from the perspective of adaptation, and the formation of adaptive capacity now and in the future is no less important than adapting actions [*Zhuchenko*, 2003]. We agree with the N.S. Kasimov and his co-authors that "consumption of natural goods shall not exceed the natural limitations due to the parameters of the environment of our planet" [*Kasimov, Mazur, Tikunov,* 2004: p. 29]. Now we increasingly use the concepts, that in one form or another express these natural constraints (to which it is necessary to adapt), in particular the concept of "carrying capacity of ecosystems", "economic capacity of ecosystems", "limit of the resistance of ecosystems" and others. According to KS Losev, each of these concepts shows the maximum allowable perturbation of the local or the global ecosystem (the biosphere) of human activities, beyond which it ceases to function as a regulator and stabilizer of environment, goes to unstable state and may eventually completely irreversibly degraded [*Losev,* 2001; *Losev,* 2003: p. 692].

Carrying capacity of ecosystems associated with environmental and natural resource types of security, since the first characterizes the degree of ensuring the protection of the biota, and the second — the degree of extraction of natural resources from the biosphere.

Stability of the biosphere and its ecosystems is the ability to maintain its operation and the opportunity to realize further evolutionary processes, to recover from disturbances and negative impacts. This is achieved thanks to the great biological diversity (number of species on the planet is more than 30 million). It is this diversity has formed the compensatory-restorative and regulatory mechanisms that guarantee in a certain range the homeostasis of the system "biota — the planet". Moreover, the stability of the planetary ecosystem provides by redundancy of biogeochemical cycles links and interchangeability of its components. The higher the biodiversity, the more stable the ecosystem, while one or two species community (biocenoses) are unstable. Priority in the concept of "carrying capacity of the ecosystem" takes environmental, but not natural resource component, and it determines the natural limitations, although it is necessary to take into account both components at the same time.

Solution of referred socio-natural contradiction means pursuing economic and other human activities within the carrying capacity of ecosystems, and mankind as a whole — within the boundaries of the same capacity of the biosphere. Actually, this is the transition to SD in a single "ecosystem scale", when adapting and adaptive activities will harmoniously combine, which should lead to co-development (co-evolution) of nature and society.

Transition to SD is global in nature and in the long term of future of civilization requires the necessity of global governance of the process of this transition. This means that the beginning globalization should get its new impetus and strategic orientation from a yet virtual model of SD, becoming no longer natural, but socio projected and controlled (first directed) process of evolutionary movement of a joint mankind. "Inscribing" the globalization in the strategy of SD requires that all components of this last strategy (and above all, political, economic, social and environmental components) shall "work" already in the direction of a new civilizational paradigm,

increasingly breaking away from the old model of development, i.e. becoming manageable process instead of the natural process.

It also means that all the main actors of the modern, and especially the future process of globalization, shall also work on the transition to SD. This particularly applies to transnational actors — international organizations, the business community, especially the TNCs and TNB, many of which have already adopted the declared commitment to SD, such as the World Business Council for Sustainable Development (more fully discussed in the last chapter of this work). However, most large-scale businesses assistance to globalization through SD began to develop thanks to the emergence and implementation of the UN Global Compact.

UN Global Compact is a voluntary international initiative to promote the principles of socially responsible business, a political platform and a practical framework for companies that are committed to the transition to sustainable development. Global Compact sets the task of developing the principles of corporate social responsibility, ensuring its participation in the solution to the challenges of globalization processes.

Now it is important to strengthen and expand the participation of civil society, especially the business community, non-governmental and other organizations, local communities and local authorities in the preparation and adoption of decisions on the transition to SD, to intensify the process of information exchange in the field of ecology and other fields of said transition. This is to some extent is already achieved through the UN Global Compact, which has being implemented for more than ten years. Important role in this process is given to the state, which should take control of the processes of transition to SD and put this transition as its main strategic goal, utilizing the political mechanisms and creating for this legislative and regulatory framework as part of the emerging global governance.

Mankind has faced in recent decades not only with the natural constraints, but with the global natural, especially biosphere, limitations. Therefore, the transition to SD due to integrity and strong correlation of components of the biosphere (as the foundation of life and control of the environment) and the formation of the unity of civilization through globalization should be a management process, in particular aspects limiting the natural continuation of market-economocentric model of non-sustainable development (UDM). And although transition to SD of course, cannot be reduced only to the limitations, however, as has been shown, they are now becoming a priority, and depending on the degree of awareness of these biosphere and other limits and boundaries, it will be possible in the future to judge the effectiveness of transition to SD at the global, regional, national and local levels.

The strategic goal of transition to sustainable development is to form an entirely new civilization model of development, which while ensuring the survival and continued further forward movement of civilization, would not destroy the environment, would be in harmony (co-evolutionary) relationship with the biosphere. If as a result of universal coordinated action we preserve the biosphere, by the same the survival of civilization and its ongoing development will be possible, not only over the next centuries, but also indefinitely.

Inevitable transition of any country in the world to sustainable development stems from the need to address common global challenges of the world community. In this sense, the transition to sustainable development is the real way to solve the long growing global issues, each of which is fraught with real danger of anthropoecological planetary catastrophe.

New civilization model emerged as an attempt to find a common conceptual framework of the joint survival population of the planet, go out of the global (and especially environmental) crisis, prevent global catastrophe — omnicide (death of all living things). Elimination of a state of "Rio process" (also known as the transition to sustainable development), or lack of active participation in this process objectively postpones it even further to the periphery of global development, going to its steady process and the "state", and will transform this country into the reservation of archaic model of non-sustainable development, raw materials or other "appendage" of the "golden billion".

That is why we cannot agree with the opinion that, for example, Russia cannot rely on the concept of sustainable development [*Zubakov*, 1996: p. 14]. That is why is justified the formation of the main areas, as well as integrated concepts and state strategy of Russia's transition to sustainable development. The answer to the question — whether Russia should move in the same direction as that of the world community, realizing "the Rio" — is already evident, despite the difficulties of implementing of the SD strategy.

According to official documents adopted, Russia should participate according to its capabilities and international commitments on global issues related to the interaction of nature and society, contributing to the protection and restoration of the Earth's ecosystem. After all, the biosphere as a regulator of the environment is a unified system, and the transition to sustainable development can only be realized by the entire united mankind. Rather, it is the preservation of the planet's biosphere, its biodiversity and sustainability, preventing of anthropogenic climate change, the protection of the ozone layer from depletion, forest protection and restoration, desertification, ensuring of safe disposal of nuclear, chemical and biological weapons, solving the issues of the world's oceans and interstate regional environmental issues, the development and improvement of the system of protected areas and a significant expansion of their space on the territory of Russian Federation, etc. [*Russia on the path*, 1996: pp. 23-26].

Solution of global environmental issues, determining the specifics of the transition to sustainable development, its difference from all other ways of non-sustainable development in Russia should be associated with the deployment of political, socio-economic, geo-environmental, financial, tax, legal and other mechanisms amid the transition to a market economy. One of peculiarities of Russia's transition to sustainable development is a coincidence in historical time scales of the transition to a market economy and democratic transition, which is typical even for the old (current) model of development. This means that economic activities should be focused not only on achievement of high economic efficiency, but also social justice and environmental safety (and security in other ways), which in its trinity should be a major system criterion of the development.

Russia plays and will play a crucial role in maintenance of the global environmental balance.

There is a quarter of world`s forests in Russian Federation, untouched by the economic development that largely provides a global stabilization of the biosphere (along with tropical forest). Moreover, Russia ensures the safety of 20% of world reserves of liquid fresh water. There are other arguments in favour of the special role of our country in the socio-natural transition to SD, what will be discussed more in the last section of the fourth chapter.

Model of "sustainable future" is still quite not clearly defined, and as long as the international community adheres to the thesis of the diversity of models of sustainable development (but with common goals and principles), one of which can be realized in each country. However, in contrast to the current working model of development, which is also characterized by "a variety of countries," it is necessary to create a sustainable future for the world community, each region and the state first of all on a conceptual and theoretical, virtual level. And only then it is necessary to implement a virtual future, creating an optimal trajectory from the model of non-sustainable development. And such trajectory for each country will have its own characteristics.

It is too early to talk about the theory of sustainable development, but scientific concepts already exist and they are described in a number of publications, the most important of which are listed in the bibliography at the end of the book and paging links. Concepts (or their spectrum) precede the creation of a theory that can only be interdisciplinary, comprehensive, covering all the major groups of modern science, as can be seen in the course of the subsequent presentation.

Vision and strategy for sustainable development

At the end of the last millennium, as mentioned, UNCED was held, which took a historic decision to change the course of the entire world community. This unprecedented decision of heads of governments and leaders of countries in the UN and gathered at the UNCED, about the change of the course of civilizational dynamics was declared primarily due to rapidly deteriorating global environmental situation and forecast of possible global catastrophe in the XXI century, which can lead to death of all living things on the planet.

Environmental challenges that will be main in the XXI century, include: climate change caused by greenhouse gas emissions, pollution and lack of fresh water, deforestation and desertification, loss of biodiversity, population growth (and its movement), waste management, air pollution, degradation of soils and ecosystems, chemical pollution, ozone depletion, urbanization, depletion of natural resources, violation of biogeochemical cycles, the spread of diseases (including new) etc. [*GEO-3*, 2002] Almost each of these environmental issues can, if a natural development of civilization will continue, lead to the destruction of humanity and the biosphere. Such environmental issues as the greenhouse effects, acid rains, ozone depletion and pollution with super toxicants are of highest concern.

Two weeks before the start of the meeting of Rio + 20 in Brazil, UNEP, established under the UN Environmental Program, issued its fifth report on the state of the environment in the world "Global Environment Outlook" — GEO-5 [*GEO-5*, 2012]. This environmental organization regularly publishes such reports: four reports on the Global Environment Outlook (GEO) have already been issued in 1997, 1999, 2002 and 2007. The report in 2012 noted that, despite hundreds of internationally agreed goals and objectives, the ecological situation on the planet continues to deteriorate (all previous reports also noted this trend) and is close to critical and even crisis-catastrophic.

This requires the abandonment of the old model (form) of civilizational development, what inexorably leads to global man-made disaster and the formation of first in theory and then in practice new in the perspective — strategies of human development, which should be efficiently managed on a planetary scale.

UNCED and other forums on SD demonstrated awareness of harmfulness of the traditional way of development, which was described as a model of non-sustainable development, fraught with crises, catastrophes, homicide (death of all living things). The transition to the new model (strategy) development was a natural reaction of the world community, striving for its survival, self-preservation and further development.

Humanity is faced with increasingly sharpening contradiction between their growing needs and the inability of the biosphere to provide them without their destruction. As a result socio-economic development accelerated way to global eco-disaster, endangering not only the satisfaction of vital needs and interests of future generations, but also the possibility of their existence. Therefore, as shown in the previous section, there was an idea to solve this contradiction in the transition to such a civilizational development that does not destroy its natural basis, ensuring the survival of mankind and the possibility of further ongoing, i.e. managed sustainable development.

Ideas of sustainable development meet objective requirements of time and can have a decisive impact on the future of every country of the world community, to play an important role in determination of the state's priorities, strategy of socio-economic development and the prospects for further reform of the country. A new strategy for the development of civilization has already determined the position of the international community — to join efforts for the sake of mankind's survival and continuous development while preserving the biosphere.

The term "sustainable development" became widespread after the publication of a report prepared for the United Nations in 1987, especially created in 1983 by the World Commission on Environment and Development, chaired by Norwegian Prime Minister Gro Harlem Brundtland [*Our Common Future*, 1989]. In the Russian edition of this book English term "sustainable development" was translated as "sustainable development", although in English-Russian dictionaries there are many other meanings — supported, long, continuous, supported, self-sustaining, protected development.

Even in the report "World Conservation Strategy" (March 1980), it was emphasized that in order to provide sustainable development, not only economic aspects, but also social and environmental factors should be taken into account. This international document, developed by the International Union for Conservation of Nature and Natural Resources (IUCN), with the support of the United Nations Environment Programme (UNEP) and supported by the World Wildlife Fund, emphasized that "the management of use of the biosphere by the mankind, ecosystems and species within it should be in such way that they could benefit to the present generation and at the same time maintained its potential to meet the needs and aspirations of future generations "(Article XXIX). But mostly in the 80s issues of "environment and development", as already mentioned, have been discussed in works of scientists of the research institute in the United States "Worldwatch" and especially its director Lester R. Brown. Since the mid-1970s UNEP widely used a concept of "development without destruction" (development without destruction), and later used the concept of "eco-development" as an environmentally acceptable development, i.e. seeking to cause the least adverse impact on the environment.

We can also assume that in the declaration of the first UN Conference on the Environment (Stockholm, 1972) the link of economic and social development with

environmental issues was also determined. Reports of scientists of Club of Rome (more than 30 reports), which showed the need to change the course of mankind development, had a very strong influence on the formation of the new strategy of the international community.

UNCED widely used definition that was given in the book "Our Common Future" (p. 50): "Sustainable development is a development that meets needs of the present, but does not endanger the ability of future generations to meet their own needs." Such definition extends the principle of social justice, not only for the present but also for future generations, which now live on the planet and have to leave acceptable environmental conditions and available natural resources. But it became clear that the principle of social justice should find not only its temporal continuation, but also should be spread to some extent on the nature (primarily — biota), which also "pretends" to meet the needs of its evolution.

Therefore, the above-mentioned definition has been criticized for its nebulosity and clear anthropocentricity, because the definition of SD should fully take into account issues of conservation of the natural environment. That is why it is important to eliminate from available definitions even overtones to the degradation of both mankind and the biosphere. It was done to some extent in the "Concept of the transition of the Russian Federation to Sustainable Development", where the sustainable development means "stable social and economic development, not destroying its natural basis" [*The concept*, 1996]. Further, it is specified: "Improvement of the quality of life must be achieved within limits of the economic capacity of the biosphere, the excess of which leads to the destruction of the natural biotic mechanism of regulation of the environment and its global changes".

The above-mentioned "Concept of the transition of the Russian Federation to Sustainable Development", was presented by the Russian Government and approved by the Presidential Decree No. 440 of 1 April 1996. The concept was adopted on the recommendation of the UNCED, in documents of which it was proposed to the government of each country to adopt its national strategy for sustainable development. The concept has become an important step in this direction and in the future it was supposed to finalize works on the project of National Strategy for Sustainable development of the Russian Federation, scientific foundations of which were developed later [*Scientific Basis*, 2002; *Strategy*, 2002; *Ursul*, 1998].

Only after UNCED it became clear that all the achievements of civilization without solution of environmental issues are endangered to be destroyed. They may disappear because all mankind will be plunged into the whirlpool of planetary ecological disaster, because the wealth of nature, self-healing capabilities of the biosphere will be completely exhausted. Also it is obviously necessary to change fundamentally the model of mankind development and even the way of life of every person, to perform the most crucial civilizational transformations in the history, which would ensure the survival of mankind and its future continued existence.

However, the whole world is on the threshold of fundamental third (after agricultural and industrial) civilization revolution. The strategy of sustainable development cannot be created on the basis of traditional universal ideas and values, patterns of thinking. It requires the development of new scientific, political and philosophical approaches that are appropriate not only to modern realities, but also offered prospects of development in the III millennium.

The concept of "sustainable development" as a global socio-natural process, in our opinion, may be determined by only two of its main features (characteristics): anthropocentric and biospherocentric. Anthropocentric characteristics in the broad sense refer to the survival of mankind (the country) and the ability (opportunity) to further ongoing (sustainable) long continuous development, so that our descendants would not have less opportunities in comparison with the current generation to meet their needs for natural resources and environmental conditions of the Earth and space (the principle of equality of opportunities of generations to meet their needs and, consequently, the right to life).

Biospherocentric and environmental feature of the definition is associated with the preservation of the biosphere as a natural basis of all life on the Earth, its stability and the natural evolution in order to avoid development of mankind in ecophobic form. In the above-mentioned book, "Our Common Future" (p. 68) it is noted that "sustainable development strategy is aimed at achievement of the harmony between people and between society and nature," which can be described as the principle of co-evolution of nature and society, man and society.

That is why quite abstract term of "sustainable development" can be defined as a form of socio-natural development, which ensures the survival and continued progress of society and does not destroy the environment, especially the biosphere (further we go back to other definitions of SD, including general)

Gradual transition to sustainable development of the world community should be carried out, taking into account principles, set out in the Declaration and other documents of the UN Conference on Environment and Development (Rio de Janeiro, 1992), as well as materials of the special session of the General Assembly of the United Nations (New York, 1997). However, each country, taking its national strategy for sustainable development, transforms them in accordance with specific conditions.

On the basis on the general approach, we mention following basic principles of sustainable development:

– everyone has the right to a healthy and productive life in harmony with nature, to live in a healthy environment for him;

– socio-economic development should be aimed at improvement of the quality of life within acceptable limits of economic (carrying) capacity of ecosystems;

– the development should be carried out without harming the environment and should ensure the ability to meet basic needs of both present and future generations;

– the preservation of the environment should be an integral part of sustainable development, economic development, social justice and environmental safety, which together define basic criteria of development, must be aggregated.

– the survival of mankind and sustainable socio-economic development should be based on laws of biotic regulation while preserving biodiversity in the biosphere;

– rational use of natural resources should be based on sustainable use of renewable and economical use of non-renewable resources, recycling and safe disposal of wastes;

– environment-friendly economic management should be based on strengthening of interrelation of economics and ecology, the formation of a unified (conjugated) ecologized economic system of development;

– implementation of appropriate demographic policy should be directed at stabilization of the population size and optimization of its activities in accordance with fundamental laws of nature;

– necessity of wide use of the principle of advanced adoption of efficient measures to prevent the deterioration of the environment, the prevention of environmental and man-made disasters;

– an important condition for the transition of society towards sustainable development is the eradication of poverty and the prevention of large differences in the level of people's lives;

– use of variety of forms of ownership and the mechanism of market relations should be focused on the harmonization of social relations, ensuring public safety;

– in the future as ideas of sustainable development are being implemented, the importance of the rationalization of the size and structure of the personal consumption of the population should be increased;

– the preservation of small nations and ethnic groups, their cultures, traditions and environment should be a priority of the state policy at all stages of the transition to sustainable development;

– the development of international cooperation and global partnership to conserve, protect and restore the integrity of Earth's ecosystems must be accompanied by the adoption by states of the relevant international agreements and other legal acts;

– free access to environmental information, the creation of an appropriate database, using for this purpose global and national communications and other means of information are necessary;

– during the development of the legal framework, environmental consequences of proposed actions should be taken into account, act on the basis of the increase of the responsibility for environmental offenses, provide compensation to victims of environmental pollution;

– greening of consciousness and outlook of the person, the reorientation of education and training on principles of sustainable development should contribute to prioritization of intellectual and spiritual values in relation to material and real;

– sovereign rights of each state to develop its own natural resources shall be implemented without prejudice to ecosystems beyond national borders; in the international law recognition of the principle of differentiated responsibilities of states for violation of global ecosystems is important;

– business should be carried out with abandonment of projects that could cause irreparable damage to the environment or environmental consequences of which are not enough studied.

As you can see, the basic idea of sustainable human development is not to exceed limiting capabilities of the biosphere. There is an obvious global and socio-natural essence of modern concepts of the model of sustainable development (including a minimum of environmental, economic and social imperatives) in mentioned principles. Focusing on planetary and socio-natural approach to development will require serious philosophical transformations. Survival and continuity of social development on a global basis should be achieved without the quantitative growth of many traditional parameters and, above all, the extensive growth of production.

The idea of SD continues ideological transformation of globalization as systemic planetary world view, on the one hand, significantly expanding the space-time of social and socio-natural interactions to the planetary biosphere volume. But, on the other hand, this extension encounters planetary (biospheric) restrictions, which impose an objective limit on further expansion of social and socio-natural processes and involves their "compression" and the acquisition of integrity within boundaries of the biosphere (except for the possibility of further expansion of space, what is involved with great difficulties). And quite often in the literature spatial, temporal, and other restrictions imposed by the natural factors are rarely or not even mentioned.

Meanwhile, the emerging global, and even more so — a sustainable world regains its integrity not only under the impact of human activity, but also natural global restrictions and features. The global world is holistic, but limited by earthly world of socio-naturalinteractionsthatinfluenceandevendetermineallotherprocessesonour planet. The most obvious limitation — not only territorial restrictions, imposing the limit on further extensive development, but also exhaustibility of natural resources, global environmental threat etc. They are limitations of the temporal nature related to spatial limits, putting time final to development of various processes in the world, including the existence of mankind.

Implementing the global goals and principles of sustainable development, so-called "priorities of SD" may be released in a given period in each country, characteristics showing the importance, the primacy of actions, defining the procedure, such as the sequence of their execution time. We consider this kind of priorities in the work, focusing on strategic and policy priorities. Thus, in Russia in the next decade from the standpoint of national security following priorities of sustainable development were identified:

– improvement of the quality of life of Russian citizens by guaranteeing personal safety, as well as high standards of life support;

– economic growth, which is primarily achieved through the development of the national innovation system and the investment in human capital;

– science, technology, education, health and culture, which are developed by strengthening the role of the state and to improve public-private partnership;

– ecology of living systems and environmental management, the maintenance of which is achieved through a balanced consumption, development ofadvanced technologies and appropriate reproduction of the natural resource potential of the country;

– strategic stability and equitable strategic partnership, which are fixed on the basis of Russia's active participation in the development of a multipolar model of the world [*The National Security Strategy*, 2009].

As you can see, these priorities of SD significantly enhance vision of SD in its triune complex, when only ecological, economic and social characteristics are unified. However, deep and simple global essence of the transition to sustainable development is in the reduction of anthropogenic pressure on the biosphere, at which the civilization "fit" into it organically and could progressively develop without degradation indefinitely. In short, in this perspective, sustainable development is the simultaneous preservation of the biosphere and mankind, their co-evolution. Further sustainable development will be seen as an impending form of co-

evolutionary interaction between nature and society (as well as the individual and society), providing their mutual co-existence and co-development.

It is appropriate to note that in recently adopted Russian official document "Principles of State Policy in the field of environmental development of the Russian Federation for the period till 2030" in the introduction it is stated that "there are following principles in accordance with the above principles of SD":

a) observance of the human right to a healthy environment;

b) the provision of favourable conditions of human life;

c) a science-based combination of environmental, economic and social interests of the individual, society and state in order to ensure sustainable development and a favourable environment and ecological safety;

d) the protection, reproduction and rational use of natural resources as necessary conditions to ensure a favourable environment and ecological safety;

e) the priority of preserving the natural ecological systems, natural landscapes and natural systems;

f) the responsibility of federal bodies of state power, bodies of state power of subjects of the Russian Federation and local authorities to ensure an enabling environment and ecological safety on their respective territories;

g) The presumption of environmental hazard of planned economic and other activities;

h) a mandatory assessment of planned impact on the environment when making decisions on the implementation of economic and other activities;

i) the prohibition of the economic and other activities, consequences of which are unpredictable for the environment, as well as projects that may lead to the degradation of natural ecological systems, change and (or) destruction of the gene pool of plants, animals and other organisms, depletion of natural resources and other negative changes in the environment;

j) to ensure that economic and other activities comply with standards and requirements in the field of environmental protection and environmental safety;

k) the right of every person to obtain reliable information about the state of the environment;

l) the participation of citizens in decision-making concerning their rights to a healthy environment;

m) responsibility for the violation of the legislation of the Russian Federation on the protection of the environment;

n) full compensation for harm caused to the environment;

o) participation of citizens, public and other non-profit organizations in solution of issues in the field of environmental protection and environmental safety, taking into account their opinions on making decisions on planning and implementation of economic and other activities which may have a negative impact on the environment;

p) the development of international cooperation in solution of global environmental issues and the application of international standards in the field of environmental protection and environmental safety [*URL 1*].

Transition to sustainable development implies the preservation and gradual restoration of natural ecosystems to a level that ensures the stability of the environment in which there is a real possibility of the existence of future generations of people, meeting their vital needs and interests indefinitely.

Formation of a new development strategy means primarily a gradual connection into a single self-organizing system of economic, environmental and social spheres. For example, from the eco-geographical point of view, geo-ecological, economic and geographic, social, geographic, political and geographical aspects of this type of development should be combined into a "stable system". Sustainable development, as a minimum, must be characterized by (at least) the economic efficiency, biospherocompatibility and social justice at general decrease of anthropogenic pressure on the biosphere. Combination of economic, social and environmental characteristics into a single strategic system of sustainable development means a new integrity that forms a fundamentally new model (form) of civilizational development.

Formation of economic activity, not destroying the biosphere, but preserving it, i.e. permissible for ecology, not going beyond carrying capacity of ecosystems — one of central tasks of formation of a future sustainable global peace. From this point of view biosphere should be considered not only as a storage room and a supplier of resources, but as the foundation and conditions of life, the preservation of which should be a mandatory condition for functioning of the socio-economic system and its individual elements.

There is still no sufficiently scientifically sound solution to create a fully biospherocompatible economy. The increased power of the economic activity of the XX century, focused on the rapid economic growth, has become a destructive force for the man and the biosphere. But biospherocompatible economy still looks like another utopia and there are no clear ways and mechanisms of its formation, which would suit the modern civilization. The resolution of this ecological and economic contradictions is seen in the creation of a new economic model, the "equilibrium" or "sustainable" economy based on principles of full and complete intensification and greening [*Ursul*, 1998; *Barlybaev*, 2002; *Bobylev, Girusov, 2004;* Towards the "green" economy, 2011; *Report on the implementation*, 2012].

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Economic systems in the process of its existence should use more and more innovative processes, increase its complexity and organization, otherwise, eventually, they come to the regressive branch of evolution, anyway ending their existence. Therefore, for continuous, or better to say, prolonged existence of any evolving economic system it is necessary to generate new and increase the degree of its organization. Systems that are prone to excessive accumulation of the past, i.e. inertial-conservative, even at certain ensuring of its safety (security), sooner or later degrade and lose their identity (quality), finishing its history. Only those evolving systems receive "skip" into the future, for which the evolutionary process is presented as a continuous innovation process, which has mainly a progressive orientation.

However, nowadays there is a further shift from predominantly extensive development of production and other activities to predominantly intensive and innovative. This means that the share of extensive factors will be significantly

reduced, and the intense innovation will be increased, more and more qualitative factors will be introduced and already introduced will be improved, forming a more rationally organized system for improvement of the efficiency of social activities.

As greater saving of costs and resources will be achieved and increased and the overall efficiency of activities, "specific load" of qualitative and innovative factors will increase and intensification by itself will achieve the most comprehensive and complete form. However, what we call the intensification of development and innovation, will be associated with a number of extensive (in some sense) factors, such as the use of scientific information, i.e. ideal factor that will continue to grow, while material factors and components will be involved in activities in their minimized and optimized form. To some extent, this minimization coincides with ecologization, however, in the early stages intensification leads to significant degradation of the environment, the growth of "natural" entropy.

Thus it means that the pursuit of innovative development, and eventually full and complete intensification, i.e. full use of qualitative factors in the increasing volume and connection of them into a single system of accelerated growth of efficiency does not exclude extensive processes of evolution. The increasing focus on the use of science achievements in the production is a high technology form of intensification that does not involve "economy of thoughts" and hiding of new scientific knowledge. Another example: the transition of agriculture on the path of the adaptive multi-system of intensification leads to the most efficient use of solar radiation, and generally these resources of cosmic energy are inexhaustible that allows to create sustainable agriculture.

The deep essence of the transition to sustainable development in all spheres of activity is in the survival of mankind and the simultaneous preservation of the biosphere, or, as mentioned above, is even shorter — in the preservation of the biosphere and civilization, their mutual evolution (co-evolution). However, for survival of the latter as a unique species, it is necessary to transform radically all areas of their activity in the direction of significant reduction of the pressure on the biosphere by times (i.e. more than 10 times).

This is a very difficult task and its implementation largely contradicts everything that is peculiar to unsustainable (or economocentric) development, which can be dated to the beginning of mankind's transition to a producing economy, environmental failure of which was most clearly demonstrated in the XX century.

XXI century can be a turning point in the history of civilization, because during it the main contradiction should be resolved — will mankind exist or not. Transition to sustainable development must remove this contradiction in favour of the survival continuous development of civilization, but in significantly altered — biospherocompatible form, not destroying the natural environment of their habitat, which is the natural cradle of all life, including reasonable.

Environmental and other socio-natural, and through them also social global issues, other global phenomena, closely associated with cosmic processes, have arisen due to the spatial sphericity and thus the closure of our planet as a celestial body, the global boundedness of the globe and its biosphere, in which anthropogenic activity is deployed. Globalization and a number of other socio-natural global processes have already been "programmed" by natural features of the globe. Globalization and the aggravation of global issues were caused by natural characteristics and features of

the biosphere and even cosmic properties of the planet as a celestial body. This is the space-natural specificity of all global processes, including globalization and global issues, including environmental ones.

This feature of globalization as a special understanding of the world is not always understood, and very often attention is focused on trends of expansion and binding fragments of society, although appearing at the same time restrictions and limits are inherently associated with this space-temporal extension. Spatial aspect of globalization began to be realized in the first place. At the time, the Club of Rome has been put forward a kind of "Spatial" maxim-motto: "think globally, act locally", which is considered by some scientists as a fundamental principle in modern globalistics. Meanwhile, the "principle of globalistics" already in its brief formulation contains an obvious contradiction and, in fact, "spatial gap" between thought and action.

Much earlier V. I. Vernadsky rightly stated that a person as a "citizen of the world" "should think and act in a new aspect, not only in terms of individual, family or genus, states or their unions, but also in the planetary aspect. He, like all living things, can think and act in the planetary aspect only in the area of life — in the biosphere, in particular the Earth's environment, with which it is inseparably linked naturally and leave from which he cannot. Its existence is its function. He carries it with him everywhere" [*Vernadsky*, 1991: p. 28]. As you can see, this scientist, being aware of the role of mankind as a global factor of development, does not divide the thinking and action on local and planetary spatial components.

However, apart from the spatial, temporal, and aspect of a global mindset is very important. It is unlikely that the concept of globalization can be limited only by the spatial dimension, which in fact took place "by default". Such "spatial" view of the world of globalization breaks the real relationship of space and time (which Vernadsky always stood against) in thought and action. It is important to identify characteristics of the global outlook and, moreover, in a temporal perspective, it can be seen that the time range, horizon of view of global processes (into the past as well as into the future) will expand significantly, taking into account also the non-linear relationship and systemic interrelation of periods (modes) of the time. Expansion of the horizon of vision is concerned with past and future and obviously present, but at the same time it is particularly worth to focus on the process of futurization that generates the appearance of leading mechanisms in all spheres of activity.

Globalization (and futurization) of time is not shown obviously in the spatial dimensions, but following them, because of the essential relationship of space and time, the latter is filled with new features that are not essential for the "pre-global" outlook. A global approach allows seeing the future of mankind not as simple and the continued expansion of Oecumene and brings fundamentally new nonlinear corrections to prospects of evolutionary processes involving man.

All anti-crisis and "cyclical" problematics should be included into the subject area of created theory of SD. Indeed, globalization of human activity involves due to abovementioned strengthening crisis-cyclic phenomena in all areas of activity of people because of the emergence of restrictions and limits. If we take a cyclic phenomenon, which began to be studied primarily in the economy, question was not raised on the possibility of their elimination or reduction (at least of downward phases). The question was mainly on the recognition of their objectivity and understanding of their development. Meanwhile, in the face of strengthening of

action of global restrictions negative consequences of crisis-cyclic phenomena in all spheres of human activity will grow. Therefore, it is important to relate study of these processes to the issue of transition to SD. After all, if it does not happen, then the transition to SD will not happen, and again it will be necessary to admit that hopes of not only environmentalists, but also other supporters of this transition will not be realized again. Therefore, it is clear that the future theory of SD should be much wider than it is now represented by most of scientists involved in this problematics, which is still hardly identified with environmental issues.

Awareness of the inadequacy of the current model of non-sustainable development to the future of civilization, its survival and preservation led to the formulation of the most common now concept of sustainable development (SD), where sustainable development is conceived as a development that meets the needs of the present, but does not endanger the ability of future generations to meet their own needs [*Our Common Future*, 1989: p. 50].

As you can see, the concept of sustainable development was formulated almost in the same terms that are used in safety sciences. The present definition includes the concept of threat and the desire to ensure the protection of vital needs (and interests as perceived needs) of future generations of earthlings. However, the issue of security of life of present and future generations, given in this definition was transformed into ecological vision of SD, all attention was focused on environmental issues and mainly on environmental safety. Ecological interpretation of sustainable development was dominant for nearly two decades in the understanding of the new civilizational model of development.

And it is clear why there is such a point of view: indeed primarily the idea of SD appeared in connection with the need to solve environmental issues what is easy to retrace by "ecological" UN fora, from Stockholm (1972) to the Rio de Janeiro (1992) and Johannesburg (2002) and again in the + 20 in Rio in 2012.

With the adoption of the SD strategy "pointless" — a natural human existence was actually completed. At the summit "Rio + 20", it was decided to develop goals of SD, which will be replaced by "Millennium Development Goals" [*Dubinkina,* 2013]. After 2015 new indicators of SD that complement GDP will be developed. There was also opened a "green light" for the green economy, which will be actively used in order to achieve sustainable development.

It is important to note that in the course of training and the "Rio +20", universities in many countries signed the Declaration on the promotion of methods and directions of education necessary for the transition to SD, on the promotion of scientific research in educational institutions on issues of this type of development [*URL 2*]. There were leaders of all seven universities in Russia and one faculty (of global processes) of MSU named after M.V. Lomonosov among signatories of the Declaration. And, of course, such approaches deserve conveyance in other educational institutions of our country.

At the "Rio + 20" business behaved much more actively than at previous UN fora on sustainable development, meanwhile the largest promotion of transition to SD of businesses began to develop due to the appearance of the aforementioned United Nations Global Compact, which began to strengthen significantly economic and social actors on the way to global sustainability.

However, the negative impression of the "Rio + 20" outweighs its advantages, and above the point at issue is that there were no new "breakthrough" ideas at the summit

and only a few major decisions were taken, which would indicate a real willingness and active movement of the world community on the way to sustainability. In fact, leaders of countries of the UN do not want to make decisive steps towards a sustainable future and to break with the consumer society. In contrast to UNCED and WSSD, only one final document, agreed with great difficulty, was adopted [Outcome of the UN Conference]. It was impossible to resolve the issue of financial support for developing countries, declaring such need to cope with costs at the transition to SD, there was no decision on protection of biodiversity in international waters, subsidies for fossil fuels, that would reduce greenhouse gas emissions, were not eliminated.

At the summit, the role of science in the transition to SD was not emphasized and specifically discussed, although it is clear that generally without it, it is impossible to perform transition to SD especially on a global scale. But as mentioned, in the end of 2013 Scientific Advisory Council of the UN Secretary General was created. Twenty-six eminent scientists from natural, social, humanitarian and technical sciences have been approved by the Scientific Advisory Board, what was announced by UN Secretary General Ban Ki-moon. The new Council will advise on science, technology and innovation for sustainable development.

It is obvious that present generations (especially of the "golden billion")are in no hurry to provide equal opportunities to meet needs of the future (as, indeed, now living mainly in developing countries) generations, dooming them, due to their short-sighted decisions on much worse living conditions, and possibly on the degradation of the entire human civilization. Many experts, especially environmentalists, believe that today's politicians lack the political will to explain to fellow citizens the need of abandonment of the growing consumption (and the consumer society) for the sake of future generations. It is assumed that, as usual, mankind can recover from the habit of living beyond means only due to a serious crisis, when inevitably they will accept restrictions, unless, of course, it would not be late.

However, this does not take into account the fact that the crisis went global, and threats to human existence gained worldwide character and scale (for example, the environmental problem visibly demonstrates it) that it is no longer possible to get out of the crisis without the use of advanced mechanisms and factors (one of main is transition to SD). After all, if environmental or other planetary catastrophe will happen, it is clear that no one will be able to eliminate its consequences. The larger the disaster, the more difficult struggle with its negative consequences for mankind and, therefore, means to eliminate global crises and disasters, to solve global challenges generally should be anticipatory rather than "lagging" — as it is now practiced by the elimination of consequences of local emergencies and disasters.

From the elimination of consequences of disasters to their prevention is a fundamentally new strategy to combat any negative processes, and for the global processes this is the main and perhaps the only temporal strategy. It is possible that a number of cyclical processes in the economy and other spheres of human activity can be "smoothed" by using preventive measures to prevent negative sides of the cycle if it has anthropogenic, not natural basis.

And although it was clear as a result of the global community of the SD strategy, that it is necessary to work together to solve socio-economic, environmental and other issues, however, there is no environmental focus in the SD strategy — it is the most common interpretation of a new civilizational vision and strategy. Up to the

present day many authors still write scientific papers and tutorials in the same aspect. For example, the "classical university textbook" by N.N. Marfenin — "Sustainable Development of Mankind" — states: "Sustainable development of mankind is a fundamental setting for the development of the world community in a direction determined by the conservation of ecological sustainability of the biosphere and favourable stable environment for the entire population of our planet" [*Marfenin,* 2007: p. 596].

Environmental imperatives are really leading in the creation and understanding of the concept of SD (especially if this interpretation comes from environmentalists). However, during theoretical and methodological researches it became clear that the SD is not just the addition of environmental factors and measurement to the traditional socio-economic development. In fact this refers to fundamentally new transformations in all areas of human development, i.e. this "innovation-activity revolution" on a global scale. Moreover, being included in the systemic transition to SD, environmental activities of mankind takes fundamentally new features that are gained due to the integrity and the interconnection of the entire system of global activity on transition to SD.

System-synergistic vision of movement for global sustainability

We can assume that the most significant advance in the field of SD still has conceptual and theoretical nature and affects mainly the formation of a new outlook, adequate to requirements of the XXI century. And although the UN actually declared 2005 the beginning of "Decade of transition to SD", however, in most countries of the world community there is no necessary for this transition political will and efficient measures of authorities in response to one of the main challenges of the Third Millennium.

This is largely due to a lack of understanding of the strategic importance of transition to SD, fundamental differences between the current and future forms of civilization process. The idea of transition to SD (as noted and will be continued to be emphasized repeatedly) was the result of understanding of ecological issues, or more accurately, and at the same time widely- environmental issues. And although there were found many contradictions in the development of mankind, however, only in the interaction of society and nature such contradiction appeared, which we consider as the basic contradiction of the interaction of modern civilization with nature.

The fate of the civilization and surrounding terrestrial and cosmic nature depends on the resolution of this contradiction in the socio-natural system of "mankind-biosphere". Main socio-natural contradiction appears (being more and more acute) in the fact that the biosphere cannot provide growing needs of the world community in such a way to avoid anthropoecological disaster. It is obvious that this contradiction is fundamentally existential and it is important to resolve it in the future, as long as our civilization has not yet died.

The basic idea of SD is the survival and preservation of the human race, the possibility of its further long existence, because in the model of non-sustainable development (UD), as mentioned in the next decade or centuries there is a threat of anthropological disaster. The way to protect mankind from the impending global disaster, as noted, may not be similar to those actions, which are carried out in case

of local disasters caused by natural and man-made reasons. From the elimination of consequences of disasters it is necessary to move to prevention and pre-emptive actions, what actually the concept of SD proposes to the international community. One of main components of innovative SD-transformations must be proactive decisions and preventive actions, which would allow postponing the disaster till more distant time, or eliminating threats and dangers. When these threats and dangers had a local or regional nature, it was possible to eliminate negative consequences even with huge economic losses, but in the case of a global scale is necessary to prevent them, what requires the formation of a completely new culture — a culture of prevention.

Now it is clear that it is important to move a global disaster at a later time in order to create in proper time means of its prevention and in the future prevent it by anticipatory actions. Thus, the SD is presented as a further relatively much safer development of mankind, when there would not be threatening anthropogenic or other man-made disasters that could destroy it as now the only known representative of the social stage of evolution.

For the first time the idea of such a safe type of development, as mentioned, was stated and substantiated by K.E. Tsiolkovsky, but in a cosmic form. He drew attention to the fact that our planet is threatened by various kinds of disasters, but mostly of natural character — increased volcanic activity, falling of heavenly bodies to the ground etc. Moreover, he believed that gravity prevents progress and therefore outside of the planet, in the "free space", mankind will be able not only to avoid threats of natural character, but, having settled in the space, to find their social immortality.

Despite the start of the development of cosmonautics, a similar version of sustainable development was utopian: in fact, in order to explore widely extra-terrestrial space, it is important to solve our earth and, above all, global issues, i.e. to solve mentioned socio-natural contradiction, but in its planetary dimension. The logic of the space version of the survival of mankind was based on the axiom of further conquest of nature and the extensive development of economic activities.

"Collision" with earthly restrictions led to another — planetary — variant of mankind's survival in the short historical perspective. And that did not led to the abandonment, but significantly restricted the extensive development of nature and the transition to an intensive way, in which qualitative and innovative factors (sources) of development substantially dominate over extensively-quantitative.

Resolution of the main socio-natural and at the same time existential contradictions and coming out to the main road of sustainable development should ensure safe development of civilization for some historical period. During several centuries of the third millennium scientific, technical and technological progress will prepare material-technical, socio-biological bases for broad development of extra-terrestrial spaces, which was K.E. Tsiolkovsky's dream, and thus the earth trajectory of sustainable development will rush to the spaces of the universe.

Principal contradiction between society and nature will be resolved this way if we manage to go over to sustainable development on our planet at the beginning of this millennium. If it happens in earthly and cosmic directions socio-natural development will come to the main road of evolution in the universe, which received the name of universal evolution. Moreover, in cosmic perspective universal evolution will exist in its social-natural form [*Ursul*, 2005; *Ilyin, Ursul, Ursul,* 2012].

General patterns and trends of global-universal evolution are evidence of this, in particular the continuation of an information vector of this evolution, when prior levels of development of matter in either form are included in higher ones, which are in co-evolutionary relation with their environment. From the standpoint of universal evolutionism sustainable development is a special socio-natural version of co-evolution of nature and society on the main road of progressive development in the universe.

Transition to sustainable development primarily serves as a transition from spontaneous to manageable world order. Moreover, the process of control is primarily associated with the introduction of restrictions on spontaneous anthropogenic process which would keep the process within the carrying capacity of ecosystems. Primarily we speak about reduction of total human impact on nature, first on the biosphere, and then on cosmic objects and spaces. Technogenic development of civilization has shown that, perhaps, we should adopt the principle of "wu wei" proposed in ancient China as a strategy for development of the most ecologically safe world, this principle proclaimed the ideal of minimum impact on the environment, still making human activity possible.

Reduction of anthropogenic impact on the biosphere and its ecosystems is the starting point of transformations that need to be taken by the mankind to go over to sustainable development. These transformations will affect not only the sphere of interaction between nature and society, but that society itself. Once N. Wiener noted that "we have so radically altered our environment that now in order to exist in this environment, we have to change ourselves" [*Wiener*, 1968: p. 58].

Reduction of anthropogenic impact on the biosphere and contributory intra-social changes should have the survival of civilization through preservation of biosphere as its objective. In fact, the issue of preservation of the mankind and the biosphere acts as an issue of their common security, and it is important to emphasize this fact, as in such cases it is quite often said about their joint development, i.e. socio-natural co-evolution. And it would go without saying that in case of co-evolution the main components of global socio-natural system should be retained, but the priority is given to joint development (co-evolution).

Meanwhile, co-evolution of society and nature as their co-development will be possible only if society, developing progressively, takes natural resources and exists in suitable, rather stable environmental conditions. This will be evident if we consider the simplest scheme of synergetic interaction between two systems, such as society and nature. If we represent society and nature as two material systems that interact with each other, then, as follows from the principles of synergy, an increase of entropy in nature would lead to its decline in society, and therefore in this respect — to progressive development of the latter (although, of course, progress of society cannot be reduced only to the growth of information, negentropy). Apparently, possible generalization of the concept of entropy, which is treated in a broader sense and means any manifestation of degradation, destruction, chaos, disorder (such a broad understanding is being developed in scientific literature) could be the basis for identifying one of the patterns of interaction between society and nature, which is of scientific nature.

The essence of this law lies in the fact that in interacting systems (in particular, society and nature) the process of disproportionation of entropy takes place: any

decrease of entropy in one system is associated with its increase in the environment. From this perspective, environmental issue appears as a special case of entropy increase in the environment due to the growth of negentropic products and systems in the society. The interconnection between these locally conjugate processes was named "disproportionation of entropy" [*Galimov,* 2001]. That is why a synergetic approach turns into a socio-natural approach and an elementary unit of evolution (self-organization), and in the course of globalization it exists not only in the society, but also in a broader system "society — nature".

From synergetic point of view, social production as the basis for the modern type of social progress is carried out by the admission of negative entropy (information generation) from the external environment, and mainly the Sun and some natural mineral resources, processes and conditions of the Earth may be such highly negentropic sources for us. And the second law of thermodynamics — the law of increasing entropy — is the fundamental law, which is crucial for the issue of energy sources and resources, necessary for the continuation and development of industrial and other social activities.

According to synergetic ideas, it is necessary not only to borrow negentropy from high-quality sources of energy, such as the sun for us, but also to dissipate waste matter and energy of lower quality in the environment for progressive development of the society (as planetary and space civilization process). And the more developed space civilization in power consumption is, the stronger the flow of used low-quality energy escaping into the environment, which even was the reason for highlighting it as one of extra-terrestrial intelligence search criteria [*Rebane*, 1982].

Currently, in the face of global environmental crisis deterioration, the task is to reduce environmental degradation significantly due to more efficient use of resources and effective interventions to protect the environment. A significant step in this direction can be made, if the civilization not only saves natural resources, uses "fossil" energy more efficiently, but also replaces this energy with renewable power and virtually inexhaustible solar energy. In this case degradation processes in the biosphere will be dramatically reduced, randomization of the environment and "fossil economy" may turn into "sustainable economy" [*Scheer*, 2002].

And this is the result of not only synergy development, but also the general theory of interaction between nature and society, when the latter exists and progresses at the expense of nature. If we understand progress as complexity in the processes of self-organization and as improved order of systems, it is clear that the processes taking place in society and nature are completely different. If society is developing progressively, there is regressive process in nature, since its resources are withdrawn and the process of simplification and disruption of natural ecosystems takes place. Therefore, the co-evolution of society and nature as their joint co-development suggests that the progress of society is achieved by increasing degradation (regression) of nature.

There cannot be joint development of nature and society, and it follows from synergetic (thermodynamic) considerations. Therefore, V.I. Danilov-Danilyan is right to some extent when he opposes the use of terms "co-evolution of society and nature", "co-evolution of man and biosphere" [*Danilov-Danilyan,* 1999]. However, if we define the concept of co-evolution as N.N. Moiseev (co-evolution is a co-development, that is, the joint development of a component and a system

in which the development of the component does not violate the development of the system) [*Moiseev,* 2001: p. 186], it appears that in some way co-evolution of society and nature can occur in case of sustainable socio-natural development, when anthropogenic effects in the biosphere fall to a level that does not exceed its regulatory and compensation potential.

And in this case the society takes resources from nature, although it occurs within the boundaries of carrying capacity of ecosystems. Within the scope of carrying capacity of ecosystems there is no essential breach of normal development of nature, which can continue its evolution, while outside the limits of it there is destruction of ecosystems. But in both cases, progressive development of society is realized at the expense of nature, which renders its resources and undergoes some degree of degradation. Minimum ecosystem degradation occurs in case of SD. Therefore, in a sense, in our view, we can talk about the co-evolution of nature and society in the form of SD, although it is clear that the element (a man), in a varying degree, breaks natural development of the system (the biosphere). SD is preserving, relatively safe type of development for ecosystems and this is achieved by the fact that the development itself is constructed in such a way as to ensure this safety, organically integrating it into the development process itself.

Something similar happens in the biosphere, when 99% of biota power is consumed for the main function of stabilization and regulation of the environment. We can assume that in society the lion's share of effort will be spent on security, particularly in the model of non-sustainable development. And as between development (D) and safety (S) a constant ratio exists (D + S = const) according to the law of conservation of energy, the efforts, spent on security, are deducted from the total amount of energy, resources, efforts, etc. that could be used for progressive development.

That is why the idea to unite development (progressive) and security appeared, so that they contradict each other as little as possible, i.e. to provide security through SD [*Ursul*, 2001b]. And since in this case anticipatory safety of all the components of socio-natural system are possible, the cost of such security can be reduced significantly in comparison with currently practiced approach to eliminate the consequences of accidents and disasters.

While recognising the essence of SD, we paid attention to the fact that it is a special type of development in the conditions of planetary biosphere restrictions. Meanwhile, there are broader material and energy constraints in the further development of civilization. And if mankind chooses the path of "sustainable existence", it will be forced to take information orientation of its progressive motion. It will mean that the main resource of manageable SD will be information and material-energy resources will become "secondary". It is on this way that the sociosphere may turn into the noosphere due to SD and the highest level of information and ecological society will be achieved.

In the study of SD model transformations information factor invades NSD model and the sociosphere turns into the noosphere (first into the information stage of the sphere of reason — ionosphere) only because of a higher degree of informatization and mediatization, because of the formation of the so-called "noosphere intelligence. "Priority and dominance of information as a resource for development over material-energy resources will be achieved by gradual extension of the sociosphere information content and by the appearance of global-social at first, and then

planetary collective civilization intelligence, capable of anticipatory management of socio-eco-development. Modelling of the flow of these information process involves an assessment of actual information content of the sociosphere and setting the minimum information content of a future global civilization as megasociety with SD. Overcoming of this minimum information content during the process of "stable self-organization" of the sociosphere will mean the end to the NSD model history and the entry into a new era of civilization development — the era of the noosphere.

We should note that all the recommendations of the UN concerning the transition to SD are mainly political in nature, although they were elaborated on the basis of the report of experts of the International Commission on Environment and Development "Our Common Future" [Our Common Future, 1989]. The report contained one of the first detailed arguments for the need to change the course of civilization development and, in fact (as well as all the UNCED and WSSD documents in aggregate) presents the conceptual model of SD. International political decision was made on the basis of expert judgements and scientific research and forecasts. However, it is clear that the available scientific evidence of the transition to a new model of socio-natural development is not enough, there is need for more basic research and even methodological transformations of modern image (model) of science. Indeed, many scientists do not pay due regard to the fact that this evidence requires a fundamental change in the science itself, and this is primarily caused by the emphasis on the study of the future. Future science will become a science capable of recognizing and exploring "sustainable future", but after experiencing some kind of "futuroshock".

The concept of sustainable development is also presented as theoretical and philosophical platform for various types of integrative and centrifugal tendencies in social life, for example, in the activities of political parties, religious organizations (especially those related to world religions), etc. For example, the existing differences in political parties tend to absolutize one (or a part) of directions of combined social activity to the prejudice of another, while from the standpoint of the concept of SD we should talk about their systemic integration. This is particularly evident for the parties and movements that take either social or liberal or environmental values as a priority. The inclusion of sustainable development goals will objectively lead to the need for more centrist orientation and for integration (co-evolution) of social movements and organizations to ensure the right of humanity to survive. And if a number of centrifugal tendencies of integration appeared on the stage of globalization (e.g., ecumenical processes), globalization through SD will greatly strengthen the unity of civilization in all fields of human activity and its interaction with nature [*Vashchekin, Muntean, Ursul*, 2002; *Ursul,* 2004; *Los, Ursul, Demidov,* 2008; *Baburin, Muntean, Ursul,* 2011; Global processes, 2011].

Strategy of global demographic sustainability

The most complex issues of the transition to SD, in our opinion, appear at the demographic level, which proved to be the least examined by science, especially in a global perspective, in relation to environmental issues.

Having raised the question of global demographic process in the future of SD, we face the manifestation of a number of contradictions in the understanding of this issue. On the one hand, on a global scale mankind should not be numerically altered

in such a manner as to disappear from the face of the Earth, as it happened with the vast majority of species. It means that the human race, being unique not only as a species, but also as a new social stage of evolution of the matter, must reproduce its numbers at the required level, below which it will not be able to survive. Thus, we should not cross certain, yet not set, lower limit of the population reproduction of the planet for the realization of sustainable development.

On the other hand, from the standpoint of sustainable development, there is an upper limit (also yet not precisely set) of population size of the planet. We should not assume that the more people live in the world, the more fully the goals of sustainable development are achieved. After all, the biosphere, as well as the entire planet, has spatial, resource and other constraints and evolutionary corridor of its natural resistance, i.e. carrying capacity of the biosphere. This stability may be violated as natural safety, and in certain cases a global catastrophe can emerge. Thereby infinite increase in the number of population (which was a dream of, for example, Russian anthropocosmist N.F. Fedorov) can already destroy our common home with other living beings, that is, global omnicide is quite likely to occur.

As we can see, these very general arguments in the spirit of realization of the goals of the global transition to sustainable development suggest that the world's population should be in a specific evolutionary corridor with upper and lower limits, in which all further demographic trajectory of the planet should fit.

Therefore we need to consider, how the real demographic process goes on in the world and how it correlates with the ideas about this process from the standpoint of the global transition to sustainable development. It is on the development of adequate ideas about this correlation that both demographic strategy in the world as a whole, and demographic policy of each UN member states, committed to the transition to sustainable future, depend.

Of two basic and interrelated objectives of the global transition to socio-natural sustainable development — to save the mankind and the biosphere — the highest priority is given to the preservation and survival of the human race. First of all, for this purpose, the idea of international community transition to SD was suggested. This idea is supposed to "trick" the nature, which throughout biological evolution consistently destroyed all emergent sorts of living beings, giving them a medium term of existence on the planet lasting only a few million years. Of the species existing billions of years ago, we can hardly find one in the modern biosphere, except for some micro-organisms (bacteria and archaea). Anyway, animals, especially as large as a human being, are not listed among long-living creatures of our planet.

But in terms of temporal existence man does not want to obey the natural laws of evolution of the biosphere, and due to his intelligence and other social characteristics that distinguish him from animals, seeks to prolong his existence indefinitely. Theoretically, such an idea does not contradict natural evolutionary processes, especially on the main and permanent-progressive trajectory of evolution in the universe (superhighways of globally universal evolution) [*Ilyin, Ursul, Ursul,* 2012].

Therefore, we can assume that if the idea of the survival of mankind through the transition to sustainable development can be implemented in principle, then along with other types of sustainability (economic, social, environmental, and others) demographic stability must be accomplished, and, in our opinion, it should be a priority.

Demographic stability from a global perspective is the most important form of stability, which should be realized in the evolutionary transition to sustainable future. Global demographic stability is what underlies the idea of transition to a new civilizational strategy. All the rest mentioned and other forms of global sustainability explicitly or implicitly aim at the realization of the main type of "human sustainability" — the stability of socio-demographic processes as the main indicator of civilization survival [*Baburin, Ursul,* 2010].

Promotion of this "indicator" of sustainability of future development, although it seems obvious from the standpoint of common sense, can fail to get approval of some "deep" ecologists, who consider the survival of humanity as equal as the survival of any other kind of living beings. And here it is appropriate to note that the survival of such unique species as the human race cannot be limited only by natural biological laws. If all other living beings in their population-species existence (not mentioning individual) are mortal, man in his social-biological species aspect through his rationality and social claims already pretends to the species immortality, which was a dream of K.E. Tsiolkovsky at the beginning of the last century. That is why the idea of demographic stability should not be seen as another "anthropochauvinistic" idea.

The human race claims to socio-biological immortality (as continuous existence and development) not just as a kind of living beings, but as a social information and intellectual material formation (the stage of evolution of the matter), intended to continue the universal evolution on its superhighway. But in principle it is impossible without finding the appropriate demographic security and stability of the social (still represented by the mankind) stage of evolution.

Having adopted the hypothesis-aim to acquire demographic stability as the main one for implementing the global transition to sustainable development, further we will consider its relation to other types of stability (especially environmental) and the implementation in a global aspect. There will be also found a number of contradictions, which in the course of the abovementioned transition need to be resolved.

Obviously, the transition to sustainable development both at the global and national levels makes certain adjustments to the implementation of optimal population policy and strategy, pursuing a dual purpose — providing demographic security and sustainability on a state and, respectively, planetary level. However, for each country there is a specificity of the implementation of demographic stability, depending on the current demographic situation and necessary (and possible) actions on the part of state leaders, directed at the approximation to a "sustainable path".

The documents of the United Nations Conference on Environment and Development (UNCED, 1992 [URL2]) note that the growth of world population and scale of production combined with irrational consumption structures bear heavily on the life-supporting capacity of the biosphere. Although the UNCED materials do not contain specific recommendations for changing the world's population, however, many researchers believe that there is very close relation between the possibility of a global transition to sustainable development and a radical change in the demographic policy of the states. And it is a new approach to population issues, because the dynamics of the population of the planet as a whole until recently has not been examined, excluding several individual countries (though these issues were considered by UN experts).

About a million years ago, the number of human ancestors was about a hundred thousand. The world's population in its Neolithic history only increased, and human consciousness got accustomed to this trend[1]. During the agricultural period of the Neolithic revolution (10-12 thousand years ago) the world's population increased by about 100 times compared to a few million hunters and gatherers in the late Paleolithic. The beginning of the use of fossil fuel energy for food production, for the movement of people and for industry needs increased this figure by 10 times during the period of 200 years.

The addition of each billion people to the one billion inhabiting the planet in 1800, took less and less time. The second billion was added at the end of the 30s of the XX century, the third — by 1960, the fourth — even after 15 years, the fifth — after 12 years, the sixth billion — in 2000, i.e. also in 12 years. Nowadays there are more than 7.2 billion people on the planet.

In the industrialized countries the population hardly increases (natural increase — from 0 to 1%). However, in developing countries, where about 5 billion people live, the number of people increases at a rate of 2 to 8% per year, depending on the country and region.

However, the quantitative growth of the world's population will not be unlimited. According to UN projections [World Population Prospects, 2010], by 2050 the world population will reach 9 billion, and then even 9,5–10 billion people in 2100 — and possibly stabilize at this level, and then will start to decrease gradually. However, if the increase in life expectancy will exceed 100 years in the next hundred years, then it can lead to an increase in the population, even up to 11 billion people, which will create a huge burden to the environment and food and pension security. Taking into account the transition to a sustainable development path it would require large investments in the sphere of family planning, which will lead to a reduction in fertility.

The studies on global demographic processes conducted by S.P. Kapitza [*Kapitsa,* 1999], also show that the Earth's population stabilizes at the level of 10-11 billion, and will not even double in comparison with what we already have. Now the population of developed countries stabilized at the level of one billion (which is often called the "golden billion"). In these countries there are tendencies that will affect other countries, other nations in the near future. Thus, the global population explosion will come to an end, which has no connection to the exhaustion of resources or to ecology and which represents a certain internal dynamic characteristic of mankind development.

These studies also indicate that the limit of the world population growth is not determined by ecology and natural resources, but by some other — internal demographic imperatives and not yet explored laws. It is possible, as S.P. Kapitsa

[1] However, there was reduction of world's population because of the global natural disaster which occurred about 75000 years ago, when the eruption of the Toba supervolcano in Indonesia led to a sharp (not less than one order of magnitude) decrease in the number of human ancestors. The consequence of this eruption was the destruction of food chains and increased competition for remaining available resources during the long volcanic winter. It is possible that in the future next few decades or centuries of its eruption could happen again, triggered by increased volcanic activity. The second time a strong population decline occurred most likely due to human destruction of megafauna as the main source of protein foods in the late Paleolithic (although assumed to natural factors and reduce the large animals). It is possible that this kind of depopulation occurred to these crisis-catastrophic events.

believes, that these patterns are determined by information factors, which we admit as quite correct assumption in general, but it is still not very clear and has no detailed explanation. Therefore, it being so, we are not talking about resource and ecological factors as crucial in global-demographic process, they may correct it to some extent — accelerate or slow down. However, we believe that here global constraints of extensive growth can act if not directly, then indirectly, including the ones functioning through information characteristics of civilization development.

Emerging global world obtains its integrity under the influence of not only human activity, but also natural — global constraints and features. The global world becomes more integrated, but limited earthly world of socio-natural interactions that influence and even determine all the other processes on our planet. The most obvious limitations are not only territorial ones that impose a limit on further extensive development but also exhaustible natural resources, global environmental threat, etc. The limitations of temporal nature related to spatial limits should also be mentioned; they often set final stage of development for various processes in the world, including the existence of mankind.

Global issues, globalization, and other global processes that are closely linked to the cosmic processes arouse due to the spatial sphericity and thus the closure of our planet as a celestial body, due to global boundedness of the globe and its biosphere in which human activities are performed. Globalization and a number of other socio-natural global processes have already been "programmed" by natural features of the globe just as, perhaps, global demographic processes. Globalization was caused by natural characteristics and features of the biosphere and even cosmic properties of the planet as a celestial body. It is in this that space-natural specificity of global processes, including global demographic issues, consists.

The abovementioned means that during the XXI-XXII centuries demographic transition can naturally occur, which consists in the fact that the expanded reproduction of the world's population will be replaced by the limited reproduction and subsequent quantitative stabilization (low fertility and low mortality). If future development confirms the possibility of spontaneous implementation of the global demographic transition, there is no need to include the mechanisms of hard demographic regulation offered by some environmentalists which aim at a sharp decline in the total number of population on the planet for the sake of further existence of the remaining and future generations. Unless, of course, it is clear that the addition of the next three-four billion people to the current more than seven billion will not lead to such an increase of anthropogenic pressure on the biosphere, which will disrupt its stability irreversibly and will cause natural disasters.

Meanwhile, demographers have such concerns, and therefore the appearance of a new goal is assumed in order to create a mechanism for maintaining the balance between steady number of human population and limited resources of the earth. Such a mechanism will be represented by sustainable development of the civilization, which is able to resolve the social-natural contradiction between the growing needs of the world community and the inability of the biosphere to provide these needs [Concept, 1996]. Once T. Malthus noticed this socio-natural contradiction, but only modern ecological situation brought an end to the debate about this scientist's rightness, and highlighted its global and threatening nature for mankind [*Lisin, Jusfin,* 1998: pp. 11-13].

In essence, it is not about restoring the balance by curbing the population explosion, mostly in developing countries, and not about the reduction of overall anthropogenic pressures on the planet by other means. Of two historically known strategies of population reduction- increase in mortality (famine, war, pestilence, genocide, etc.) and birth control through family planning — we can speak only about the second direction, the so-called "humane depopulation", i.e. about voluntary and conscious reduction in fertility among couples. India promoted this initiative in post-war years, but failed. It is not surprising because all the world's religions, and almost all the states have always encouraged a different trend. However, nowadays a number of scientists relate the spontaneous growth of population to the path leading to a global ecological catastrophe. That is why now they say about upcoming demographic revolution not only in terms of natural demographic transition, but also in terms of humane depopulation (due to family planning, now perhaps even strategic planning), which could guarantee demographic security of the international community and forthcoming exit to the path of SD.

In the works of the Club of Rome processes and scenarios for the world population growth control were already modelled. If the population growth control strategy had been introduced in 1975, the "zero growth" could have been achieved by 2050. If the control had been initiated in 1985, by 2050 the world's population would have reached 8 billion, and if it all had started in 1995 there would have already been 10 billion [*Meadows,* 2007]. As you can see, demographic modelling shows that government regulation and possible transition to global governance can significantly influence population growth.

Even during the transition to environmentally sound technologies in the conditions of continuing population growth, the total anthropogenic load on the biosphere may increase more than twice by the middle of the XXI century, which can be fraught with irreversible loss of stability of the biosphere. It becomes clear that rational mechanisms, including conscious maternity (family planning), represent one of the ways to avoid ecological collapse, and it is important to begin its humane implementing in the near future, because the nature itself can make it inhumane. We are talking about the possible influence of environmental factor on all demographic projections, which were yet given with no account taken of rapidly increasing damage to the biota with complete destruction of natural terrestrial ecosystems because of the violation of the biosphere stability by human activities.

Meanwhile, there is a difference in the form of depopulation in the past and possible "ecological" depopulation in this millennium. When we speak about possible manageable humane depopulation, we do not mean the reduction in the number of people in developing countries, we mean retaining of that "golden billion" of developed countries. This point of view seems inadequate in relation to the transition to SD, because we need to see the ultimate and integrated goal which consists in reduction of anthropogenic pressure (which was not "pursued" by, for example, the abovementioned upper paleolithic depopulation, when there was a significant reduction in the population of the planet).

In this sense, the representatives of developing countries are right, saying that the population growth in these countries is not a major threat to the stability of the biosphere, as four-fifths of the "South" consume less than 20% of all resources and four times less pollute the environment in comparison with developed countries.

From this point of view, one-percent population growth in the United States represents greater threat to the biosphere, compared to more than two-percent growth in any of the developing countries, as one ("average") resident of the United States consumes 15-20 times more resources than an" average "citizen of India, and especially Ethiopia or Afghanistan. In this sense, more than 1.3 billion people in India has the same anthropogenic impact on the biosphere, as several tens of millions of Americans — and in fact now there are about 320 million people in America, and each year the population of the USA increases by more than 3 million people. If the current rate of one-percent population growth in the United States remains, in 2030 there will be 350 million people, and by the middle of the XXI century — about 400 million people. If no special measures are taken to reduce anthropogenic pressure, the United States will put the same amount of pressure on the biosphere as 8 billion people in developing countries by the end of the demographic transition, which eloquently speaks about the "American style" of resources exploitation and about the nature of waste. That is why the United States should, as the Council for Sustainable Development under the President of the United States (abolished by G. Bush) previously believed, be the first to set an example of solving the issue of population growth and efficiency of resources use.

It should be noted that previously negative effects of an overall increase in population on the planet were almost ignored. Meanwhile, the number of population and especially its density play an important role in civilization processes, although this process has not been closely studied. And, nevertheless, biosphere and ecological view of this issue shows the need for a detailed study of demographic processes as growing number of population and its density significantly affects both intra-social processes and the relations between society and nature. Increase in the density of population and the excess of eco-acceptable limit coincided with the beginning of bloody wars in the history of mankind. In future in order to maintain the stability of ecologically overstocked society different kinds of limitations are implemented [*Arsky, Danilov-Danilyan*, 1997].

Taking into account the coming demographic transition and the need to create favourable conditions for the future descendants, each country needs to reconsider its demographic policy.

Until now many of the measures taken, various demographic programs and projects proved to be ineffective, because, in our opinion, they proceeded from inadequate causes and assessments of population impact on the environment. Increase of anthropogenic pressure on the biosphere may be considered as the main reason (if it is a global dimension) of a possible planetary anthropoecological catastrophe may be considered, which is undoubtedly connected with the quantitative growth of population and the growth of its material (not spiritual) needs, satisfaction of which becomes possible only at the expense of both inert matter of the planet and biota, of its consumption and, as a consequence, the destruction, the loss of stability of the biosphere.

According to the researchers who devoted themselves to the study of this issue, the international community, as a whole, needs to solve the problem of significant reduction (almost in order of magnitude) of consumption of primary biological production [*Gorshkov,* 1995]. Basically it can be solved by reducing the pressure on the biosphere of economic development of rich in biodiversity areas, by cessation

of deforestation and reduction of wetlands, by enlarging the area of protected territories, which creates the necessary reserve capacity of the natural (wild) nature that regulates and stabilizes the environment. It is clear that reduction of anthropogenic pressure may occur not only as a result of the proposed by a number of scientists humane depopulation.

The idea about the necessity of reduction of anthropogenic pressure on the planet, including its implementation at the expense of demographic factor, contradicts traditional views. The possibility of sustainable growth of livelihoods in the past was ensured by population growth. Until recently, almost no population growth was restrained by environmental conditions on a global scale, despite the fact that the permissible number of people from the standpoint of ecology is significantly (several times) less than the present-day amount of people. It is obvious that under spatial and other environmental conditions any territory has a certain carrying capacity both for every living thing and for inhabiting it (populating) humanity. Further overpopulation leads to undermining of the biosphere stability on the planet and other "planetospheres" (geospheres) and has a boomerang effect on the mankind and biota. We should note that demographic compensation requires two-percent increase in GDP for every percent of natural population growth.

Until now, the growth of population on planet Earth has been mainly promoted by economic factors due to proportional growth of the working age population in its total amount. It was natural for a period of extensive economic and population growth (population explosion) of the whole mankind. Anthropogenic pressure caused by population growth and development of production was exceeded at some particular stage. If we proceed from the permissible number of world population suggested by some scientists (V.G. Gorshkov, N.F. Reimers and others) which is equal to one billion, then it corresponds to the year 1800 in the world when the industrial revolution only started its triumphal procession across the planet. It is quite possible that already for two centuries the mankind has contributed to the widespread, yet reversible, but already global destruction of the biosphere, undermining its stability and thus the conditions of its existence and the biota. It is in this that the mankind differs from many biological systems that stabilize their habitat, where it is disrupted only by large animals, the number of which does not exceed one percent of all living matter.

In fact, we are speaking about the rejection of natural demographic development and about the transition to a globally-managed, more consistent with the objectives of sustainable development, intensive (in terms of quality, not quantity) demographic process.

In this case we are talking about completely different "sustainable" demographic strategy that differs from the traditional (natural)one and that requires the inclusion of reasonably controlled mechanisms of humane depopulation. And although such a preventive self-regulation is a very controversial and complex phenomenon, but in principle it is globally implemented manageable process. Certain points in this respect are contained in the adopted by UNCED "Agenda of the XXI Century" [Agenda], which emphasizes that the problem of population growth control is very delicate and requires the understanding by all the sectors of society (especially by women) of the relation between demographic trends and factors, on the one hand, and sustainable development on the other. The document is of general political advisory nature and focuses on the need for extensive deployment in the UN member-states of activities

directed at settling population issues, their connections with the possibility of transition to the path of SD and a fundamental change in global demographic trends.

It clear why the UNCED recommendations are very diplomatic in nature, although almost all subsequent major UN documents, dealing with the issue of relation between demographic problem and sustainable development, contained this kind of recommendations.

Ways to enhance and develop the concept of sustainable development

Over the past 20 years after UNCED more than half of the world community adopted strategies or programs for sustainable development. However, on the basis of the results of the dynamics of social and environmental issues of our planet, we can conclude that the principles of sustainable development in the form, in which they are now understood, could not be fully implemented in any country of the world. We can say that not only ignoring this transition, but even powerful resistance to the movement towards a new development model takes place. The mankind as a whole was not yet ready for a new revolutionary turn in its history.

Here the question arises: could be the reasons hidden in the very understanding of SD? There are, in our opinion, only the outlines of a future theory of SD, it needs to be created, and further we will get acquainted with some suggestions in this direction of research, which extend the interpretation of SD as a global process.

Environmental emphasis in the understanding of SD only highlighted the problem of the need to get over to a new model of civilization development, but at the same time showed the limitation of this vision of SD. Ecocentrism of SD interpretation began to falter in its implementation, and such successful promotion of SD ideas to the extent environmentalists expected turned out to be impossible. And the problem lies not only in the lack of political will among the state officials of our planet (and the lack of understanding the idea of SD by most people, not to mention the need for such a transition for the sake of not yet existing future generations), but also in the very interpretation of this type of development. SD as a new but already controlled form of civilization revolution in principle should be directed against all the crisis phenomena and catastrophes (not just environmental), including the crisis in the global economy. The appearance of the crisis phenomena, for example, in the world economy, which had a negative impact not only on the economy itself, but also on the process of preparation and conducting of "Rio + 20" indicates that the adopted conception and strategy of SD turned out to be insufficiently systemic and holistic, thereby insufficiently adequate.

Although the theoretical prospect of the model of "inscribing" human activity in the biosphere is obvious, its practical implementation is impossible because it contradicts a number of trends. It is also impossible (especially after Muslim-Catholic opposition to this idea) to turn over the rest of the developing world and the United States, i.e. more than four billion of the world population, to the Chinese model of family planning (one family — one child). In addition, developed countries are unlikely to voluntarily give up their high incomes and to lower their material living standards for the sake of future generations: they do not give up on this even for the sake of the majority of the poorest modern generations. Some shifts are possible in this direction, but the hope for their effectiveness and, what is more, rapid implementation, would be a utopia.

Such a radical change in the traditional course of mankind development in the coming decades is, in principle, impossible, as well as the change in the nature of man in the direction of significant improvement of human qualities and lifestyle. But some positive changes are still possible. Moreover, the degree of approximation of the actual trajectory of the transition process to the ideal model of sustainable development will determine the measure of civilization survival, including the quantitative parameters of the process, similar to those presented in D.L. Meadows' and co-authors' works [*Meadows, Meadows, Randers,* 1994].

In our view, the real process of quite long period of transition to sustainable development will represent a "mixed" strategy — partly similar to the model of manageable development, having focus on "sustainable society" and partly to the continuation of spontaneous inertial motion along the path of non-sustainable development. And it is connected with the fact that the transition to sustainable development must be globally controlled (or directed) development, and the international community is not yet such, in spite of the adoption of documents on the transition to sustainable development during UNCED and other UN forums on SD. Therefore, in those countries and regions that will lag in the national development behind the necessary level of global transition process, in the first place catastrophic processes may occur, primarily related to global warming, ozone depletion, desertification, loss of biodiversity, etc. Global ecological disaster will break out in a varying degree, but to a lesser extent than the radical change of course may happen, than the effective transition process of moving towards sustainable development may unfold. Predictions of the extent to which implementation of the SD strategy is possible can be based only on the insertion of quantitative parameters into it and the definition at a global and national level of indicators and parameters for assessing progress in this direction.

It should also be borne in mind that the amount of money (the energy conservation law in its special form) that is spent on these or that events, is constant at the given time, so its expenditure on the environment should be seriously grounded and realized not only by a small group of intellectuals, but also by some critical number of the country's population, and in principle by the whole planet. Preservation of social (and socio-natural) justice for future generations should go together with some attention to the current generations, where the justice is broken (which is paid special attention in socialist doctrines).

And it is possible that not having disseminated and realized the principles of sustainable development for current generations across the planet, the mankind in general will not be able to switch to this new type of development. Here we face one of the most significant conflicts of transition to SD, when instead of a priority to ensure a decent life for current generations the mankind switches the focus of its activities on future generations, about which still little is known. But the transition to SD, first of all, depends on the current generations and therefore it is important to start realizing the principles and objectives of SD first of all for the now existing generations with their prolongation on all subsequent generations of the world's population.

Environmental focus of this concept became inevitable and right step, focused on long-term, strategic perspective. Sustainable development in this sense implies the survival of civilization and even improvement of life quality of the world's

population without increasing use of natural resources and without degradation of the environment to such an extent that it may lead to exceeding the carrying capacity of the Earth as an environmental system. Despite the fact that the transition to SD may require different actions in each of the states, current efforts to build sustainable future require an integrated approach to activities primarily in three key areas: economy, social sphere and ecology.

Formulation of a new development strategy means a gradual inclusion into a single self-organizing system of economic, environmental and social spheres. In this sense, sustainable development must be characterized by (at least) economic efficiency, social justice and biospherocompatibility with general decrease of anthropogenic pressure on the biosphere.

But it turned out that this is not sufficient, and sustainable global perspective cannot be achieved if we do not take into account the short-term challenges and threats to the SD generated by modern market economy. And not only economy, ecology and social sphere, but also politics and a number of other important aspects of real human activity. It reflects the contradiction between the proclaimed new form of civilization development and the current form of non-sustainable development. The new model of civilization development was found, on the one hand, more promising, at least in social and environmental perspective, since it seems that due to this civilization can survive.

But, on the other hand, still created at theoretical level, this model is very "lean", less systemic and does not include some more components in terms of development and security that characterize the modern model of development, more and more often referred to as a "the model of non-sustainable development". It is these components that "pull back" the movement in the right, but not rather systemic, very stripped-down, one-sided direction. Sustainable future confronts the threats posed by not yet included fields (they continue to develop in the framework of the NSD) that significantly retard the progress towards the SD of ecological orientation.

We should not assume (and thus make narrower) that the key to the SD transition lies in the solution of environmental issues, which are global now. We should talk about all the global issues and negative planetary processes that need to be resolved in the transition to SD. Thus, one-sided ecological vision of the transition to SD gives way to globally-integrated interpretation of the movement towards sustainability. It's a kind of a global-temporal law of "conservation of energy": the more irrational current generations use natural resources, the less amount of it is left for future generations. And not only resources, but also environmental conditions which can be viewed as a resource in a wide synergetic sense.

In our opinion, "environmental dimension" of the movement towards SD is only the beginning of a new way of understanding the meaning of a global sustainable future. Environmental issue in its global vision is a part of the overall process, which requires the solution of all global issues, which already got some attention as soon as the conception and strategy were adopted [*Ursul,* 1993; *Ilyin, Ursul, Ursul,* 2015]. We should not assume (and thus make narrower) that the key to the SD transition lies in the solution of environmental issues, which are global now. We should talk about all the global issues and negative planetary processes that need to be resolved in the transition to SD and that retard or even disrupt the transition. We should not assume that the required theory of SD is already created and the only problem

consists in its implementation. In our opinion, the imperfection of the theory of SD (which is hardly can be called a theory) is one of the reasons why mankind cannot go fast enough in the direction of its survival and sustainable existence.

It is important to link concept of SD (this is more appropriate reference to a scientific form of this phenomenon) with the globalistics and global studies, because this is mainly about the global process. Biosphere through its natural limitation has impact upon all the processes occurring in it, including human activities.

This feature of globalization as a special world view is not always comprehended and quite often the focus is only on society trends expanding and binding fragments especially when it comes to globalization, although the restrictions and limits appearing herewith are inherently associated with this spatio-temporal extension. "Market expansion", the growth of markets first of all, and other parameters of economic growth complete its expansion in the convergent and, in principle, limited world of the planet. But if the expansion of markets for some reason is limited, then at some point further deepening of labour division is not possible, and therefore, the economy is facing a serious crisis, which was called by M.L. Khazin a "crisis of the decreasing efficiency of capital". The scientist makes a conclusion, "as the process of expansion of markets is limited by the size of the Earth, then the scientific and technological progress in its current model is fundamentally limited in time, it must inevitably, sooner or later, come to its end" [URL1, URL3]. However, even Adam Smith believed that a growing economy can be effective only for a limited time, about two centuries only, after which population growth and decrease of natural resources will lead to the limit and then to the stabilization of the economy and its transition to stabilization [*Smith*, 1962].

The global nature of future development with its limits and boundaries compels to view our common future not so linear as this development, has been before when everything was growing and expanding in terms of quantity — population, production, demand, etc., etc. It is the "ideology of growth" the market economy rested upon, but if it gets slow and what is more stops due to objectively existing global circumstances, mankind is going to face the crisis, from which one can withdraw only by creating a brand new stable and intense biosphere — friendly economy. Future generations will have to live in a non-linear globally-limited world, and they will have to connect not only the economy and the environment, the economists timidly and reluctantly voice, to economists, but also to create a different — not just and not only "green" economy, but alternative non-linear intensive economic activities [*Ursul*, 1986a; *Ursul*, 1986b; Intensification of science, 1987], and it is not very clear what place in it will be taken by market "element". And how our descendants, will manage to satisfy their needs when many of the resources are not only limited, but even disappear, in any case — a series of non-renewable material and natural resources, which are ruthlessly exploited today. Involuntarily, one has to shift to information and intellectual resources, creating thus the habitat homo sapience that V.I. Vernadsky believed to be noosphere.

However, as it was mentioned, apart from spacious aspect, the temporal aspect of a global thinking is quite significant. It is unlikely that the concept of globalization can be limited only to the spatial aspect, which in fact took place "by default" [*Ursul*, 2012]. Such "spatial" world view of globalization breaks the real relationship of space and time (which has always been opposed by V.I. Vernadsky) in thinking and activities.

It is important to identify the properties of the global outlook and, moreover, in a temporal perspective, it can be manifested when the time range, perspectives of global processes will significantly expand (both to the past and future), as well as take into account the non-linear progress and system correction of periods (modes) of time. Expansion of the view prospect pertains both past and future, not to mention the present time, but at the same time it is particularly important to focus on futurization process generating the emergence of leading mechanisms in all spheres of activity. The global approach allows you to see the future of humanity not as simple and still continuing expansion of Oecumene and introduces fundamentally new nonlinear corrections to the prospects of evolutionary processes human involvement.

It has become clear that all global processes and above all globalization as a process of integration and gaining integrity of mankind, not only the creation of the planetary community of civilization, but also a single global social and natural system "man — society — nature" on the principles of co-evolution should be associated with the transition to the path of SD [*Vashchekin, Muntean, Ursul*, 2002; *Ursul,* 2004; Global processes, 2011; *Baburin, Muntean, Ursul,* 2011; *Ursul, Los*, 2012]. It has already been pointed out in the Johannesburg Declaration on Sustainable Development in 2002. This means that the globalization processes making the content of globalization as a single global process, in the long term should be developed in line with the transition to SD and in the same "globalization" trends there should be ensured security, forming in its integrity what is called global security as the security of the international community, implemented under conditions of co-evolution "man — society" and "man — society — nature " systems.

In the subject and globally scalable areas of the created SD theory, as noted above, there should be entered all the anti-crisis and "cyclical" problems. Indeed, globalization of human activity involves in view of the foregoing with the strengthening crisis-cyclic phenomena in all areas of human activity of people because of emergence of restrictions and limits. If one takes a cyclic phenomenon, which became the subject of the study primarily in the economy, the issue of the possibility of eliminating or reducing (at least downward phases) has not been investigated. It was mainly about the recognition of their objectivity and understanding of their development. Meanwhile, in the face of strengthening of global action limits there will also increase the negative effects of crisis-cyclic phenomena in all spheres of human activity. Therefore, it is important to link these processes to the problem of transition to SD. After all, if it never happens, then the transition to SD will not take place as well, and again one will have to admit that all the expectations held not only by environmentalists but other supporters and enthusiasts of this transition will never come true. Therefore, it is clear that the future SD theory of should be much broader as compared to the understanding held by the majority of the scientists engaged in these problems.

A step in the expansion of SD concept was made in September 2000 at the Millennium Summit, which adopted the "United Nations Millennium Declaration", which greatly expanded, especially in the social aspect, vision of the future development of the world community. Nest year there were developed eight global goals (MDGs) and 21 tasks for the period up to 2015 mainly on the basis of eight chapters of the Declaration where the countries have undertaken certain obligations. Moreover, assessment of progress towards the MDGs is performed for more than 60

indicators, covering the 190 member-states of the UN. United Nations Development Programme in 2005, adapted the concept of the MDGs for Russia and the reports have been prepared by UNDP on the progress in achieving the MDGs in Russia [Report, 2012].

But there was observed not only social expansion of future global development. There emerged the works with broader interpretation of the concept of sustainable development, where it was associated with the concept of security, not only in environmental aspect. It has been shown that the stability of society, state, economy, etc., as well as their safety can be "guaranteed" only at implementation of the model and the strategy of sustainable development [*Ursul*, 1993; *Ursul*, 1994; *Ursul, Ursul,* 1995; *Ursul*, 1995; *Ursul*, 1995; *Ursul,* 2001a]. Broader understanding of SD as the most secure development, and not only — ecologically safe gets more and more common, and this idea will be discussed further in more detail.

It is possible to ascertain the increased interest in the relationship of theory and the concept of security, which is evidenced by the emergence of a number of works in this scope [*Ursul, Romanovich*, 2001; *Dzliev, Romanovich, Ursul,* 2001; *Romanovich*, 2002; *Romanovich*, 2003; *Romanovich, Ursul*, 2006; *Ursul, Ursul, Engel,* 2008; *Ursul*, 2008; *Baburin, Dzliev, Ursul,* 2012; *Ursul, Ursul, Ivanov*, 2014]. Recently, the investigation of the problem of security, in our opinion, clearly reveals two very important trends that can be called extrapolation and globalization, which further will be discussed in greater details. Extrapolation characterizes the spreading of the concept of security in those areas and components of human activity, which only a few decades ago, were not included in the subject area of safety studies. Globalization of security problem suggests that this expansion is going on in the global dimension, when a research idea shifts from local-state and national-regional problems to global scale and security problems. Both trends are significantly expanding the concept of security and actually have formed it as an interdisciplinary, general science, and perhaps even a philosophical category.

At such expansion of security concept there also take place the conceptual and even paradigmatic revolution in the understanding of the problem under discussion. The significant element in the process of security nature re-thinking (in Russia at least) turned out to the adoption of such a fundamental document of the state, as "National Security Strategy of the Russian Federation until 2020", the conceptual basis of which was ensuring national safety through sustainable development priorities.

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