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Professional consulting, planning and design of regional development in the face of increasing uncertainties and risks

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ABSTRACT

The article reveals features of the ongoing transformations in the field of consulting, planning and design in the field of regional development in the face of increasing uncertainties and risks, primarily related to climate change and biodiversity loss. It shows that the very basis of such work is significantly changing, as the world-system becomes more complex, during the transition from the concept of an "empty" world to a "full" world. This change includes increasing emphasis on ensuring the resilience of human-dominated ecosystems, a change in decision-making, using behavioral a "responsible" human model that best meets the needs of inclusive sustainable development.

The authors define features of consulting, planning and design of regional development in the face of increasing uncertainties and risks, as a special type of thinking activity, in a situation of approaching radical uncertainty. The article shows the necessity of supplementing natural science approaches with the tools and practices of post-normal science and the narrative theory of beliefs, as well as the ideas of K. Friston, implemented within his dynamic causal model.

Such an approach is based on a systematic approach to decision-making in regional development and pays special attention to the adaptation of individuals and communities to high risks and uncertainties, primarily climatic and natural. It helps to better reflect the diversity of geographical conditions, to clarify the range of effective solutions for sustainable development of regions and increase the long-term resilience of business.

KEYWORDS:

consulting, regional planning and design, risks and uncertainties, ecosystem services, inclusive sustainable development, resilience, human-dominated ecosystems.

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1. INTRODUCTION

In the context of the current high uncertainties and risks, the institutes of professional consulting, planning and design of spatial development are experiencing a crisis. Thinking about what is happening, experts and engineers feel confused and anxious, because their habits and formats of activity are losing their effectiveness and no longer respond to the challenges of our time. They observe an increase in man-made accidents, negative environmental and social consequences of many decisions, an increase in the greenhouse effect, an increase in the consumption of natural resources, and the dominance of "brown" energy and resourceintensive technologies. Excessive consumption has already come at a cost for the natural systems that underlie life on Earth [Nature risk rising.., 2020]. An additional imbalance is brought by the rapid transition to a new technological order, the mass introduction of a number of globally significant critical technologies[1] and the unpredictability of their combined impact on people's lives, the increasing speed and trends of social processes – from global to local. Also, the COVID-19 pandemic, with its severe damage to societies and economies, reminds that environmental health is inextricably concerned with human and animal health[2]. It is no coincidence that the IV Summit on Sustainable Development, held in the context of the UN General Assembly on 21-24 September 2020, stated: "To return the world to the path of sustainable, equitable and inclusive growth, it will take more than a global recovery – a deep reset of social and economic systems"[3].

The period of instability[4] that has begun is characterized by a fundamental change in the existing structures, culture and social systems, society and its institutions. Complex non-equilibrium Human-dominated ecosystems cease to be controlled at the usual indicators formed in line with the classical paradigms of planning and engineering design, even with the help of computer observation systems [Fomenko, Fomenko, 2020]. This process is unbalanced, and the transition to the new economy that has already begun exacerbated the problem of multidirectional socio-cultural institutional changes.

[1] Critical technology is a technology, the development and use of which ensures the interests of the state in the field of national security, economic and social development. See: Resolution of the Government of the Russian Federation No. 54 as of 29.01.2007 (as amended on 06.10.2011) "On the Federal Target Program 'National Technological Base' for 2007-2011"..
[2] Three of the four emerging infectious diseases are zoonotic, meaning they are transmitted from animals to humans, and they have been contributed to by rapid and widespread deforestation and urbanization, as well as the illegal trade in wild animals [How to save.., 2020].
[3] https://www.weforum.org/events/sustainable-development-impact-summit-2020.
[4] Proceedings of the Expert Forum "Green Growth and Sustainable Development Forum 2015 - Enabling the next industrial revolution: Systems innovation for green growth" (OECD, Paris, 2015). Along with experts from OECD countries, China, and a number of other non-OECD countries, the authors of this article participated in the forum's events.

The goal-oriented impact on such complex systems in their constant nonlinear development is not only limited, but also the point of impact itself is vague. At the highest expert level, it is acknowledged that the global picture of the world will undergo significant changes in the nearest future, mainly under the influence of increased climatic, natural and social uncertainties and risks, and it is important that the development scenario becomes favorable for people's lives.

Our hypothesis is that as the uncertainties and risks of development increase and the world system becomes more complex against the background of limitedness of ways and limits of possible transformations, professional consulting, planning and design of spatial development will have to change significantly: (1) become more humane, inclusive and sensitive to the variability of the world, the nonlinearity of development and the behavioral aspects of people's real decisions; (2) in relation to the private and corporate sectors of the economy, focus on improving the resilience of companies and corporations in situations of high uncertainties and risks, primarily climatic and natural; (3) there will be a difficult choice of a system of target priorities, a review of spatial development measures and corporate tools.

Research on the evolution of professional consulting, planning and design in the field of spatial development with increasing uncertainties and risks was carried out by the authors on the basis of the research and production association "Institute of Sustainable Innovations" in 2020.

2. METHODS AND MATERIALS

In the context of increasing uncertainties and risks at the beginning of the XXI century, primarily climatic and natural, as well as the uncertainty of the social development of the future world, cosmetic changes in the approaches, methods and tools of professional consulting and spatial development design are clearly not enough. The futility of reductionism, the lack of understanding of anthropological and natural systems and respect for their complexity, the desire to simplify the problems of strategic development and solve them using unified methods and standard engineering solutions, without taking into account the peculiarities of the territories where objects are located, is becoming more and more obvious.

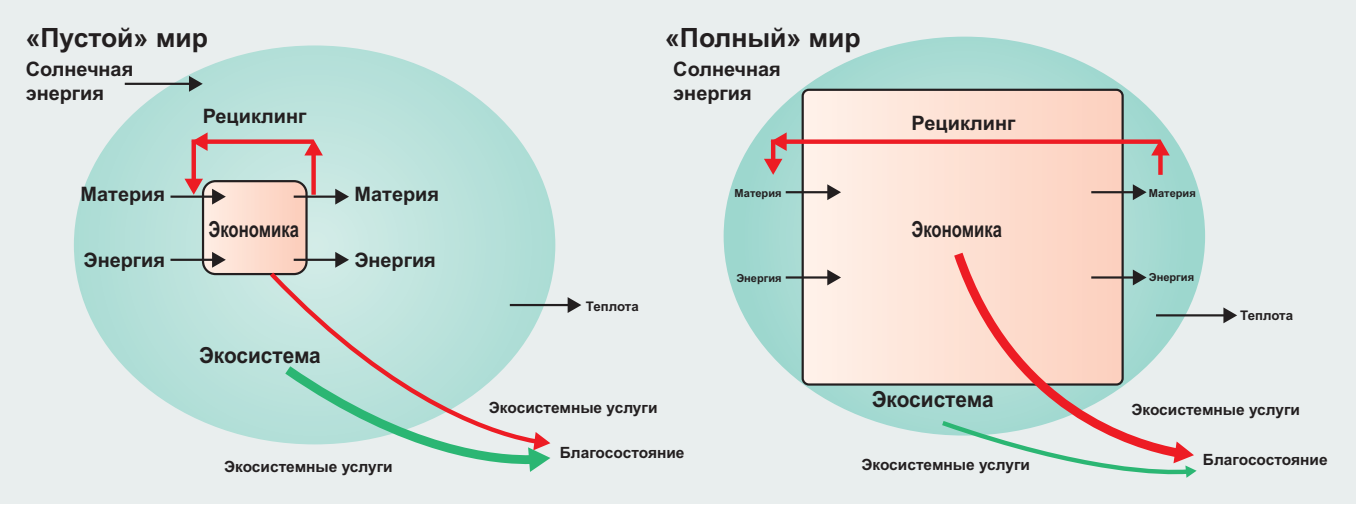
The leading positions are taken by the ability of consultants, planners and designers to system thinking and an interdisciplinary approach, focus on reducing the risks of loss of viability, the ability to find and see the priority "red points" of the efforts application: whether it is a socio-cultural situation, an engineering complex or any other focus of transformative impact. Understanding the new requirements that determine the prerequisites and methodological features of professional consulting, planning and designing of spatial development with increasing uncertainties and risks is based on accepting the actually observed complexity of the world-system, targeting the state, dynamics and evolution of anthropological and natural systems, developing solutions in unusual conditions of approaching extreme uncertainty, with special attention to the category of responsibility.

2.1. INCREASING COMPLEXITY OF THE WORLD-SYSTEM

In just a couple of decades, the world has become enormously more complex and qualitatively different; the explosive growth in the spread of information and communication technologies, drones, biotechnologies, etc. is changing all spheres of society, the structure and nature of resource flows, which leads to an aggravation of socio-cultural contradictions and conflicts of interest. Entire industries are passing on, many specialties are going into oblivion; life and professional experience increasingly ceases to give the right signals for decision-making; the usual statistics begin to lag behind, "not noticing" new trends in development. The concept of a developed, "empty" world (uncharted wild territories and an abundance of natural resources) is replaced by an understanding of its extreme fullness – the concept of a" full " world by G. Daly (2005), where Human-Dominated Ecosystems (HDE) dominate (Figure 1).

Life in the "full" world radically changes the vision of the very process of self-development of humanity: the unlimited possibilities of resource expansion are replaced by an understanding of its limitations and fragility. It is worthwhile to agree with the leading experts about the high probability of the transition of the modern world through a period of chaos or bifurcation with a significant change in the existing structures, culture and social systems, while the dominant ideologies, social institutions, and habits of thinking are still rooted in the "empty" world. If we continue to live by these rules, the collapse will not be long in coming [Von Weizsaecker, Wijkman, 2018]. How and when such a transition will take place is not clear enough, however, it is necessary to take measures, as far as possible, to avoid a scenario that is negative for the survival of humanity. At all levels of territorial organization – from global to local – it is necessary to increase attention to the health of the planet,

Figure 1. Well-being in a "full" and "empty" world



Source: [Daly, 2005].

without separating man from nature, to reduce the risk of HDE hitting a situation of extreme uncertainty[5], when the task of minimizing adaptation risks becomes unsolvable. It should be borne in mind that as we approach the phase transition, when there is less and less determinism in the behavior of the HDE, there are practically no opportunities for simple fragmentary engineering solutions.

As the world-system becomes more complex, the distinction between irrefutable facts and soft values, characteristic of the classical scientific tradition, is replaced by the structure of "soft facts / hard values" [Funtowicz, Ravetz, 1991]. In an unstable external environment, the main role belongs to the mind with its ethical and value ideas and needs, thus the positivist approach is complemented by elements of the normative, value-based and socio-cultural conditioned. This is due to the development in recent decades of approaches to the systematic concept of life, the acceptance of multi-variant scenarios of the future, the multiplicity of concepts of rationality (see more in [Fomenko, 2004]), the gradual awareness of the increasing importance of climatic and natural uncertainties and risks. The terminology is also being significantly adjusted – concepts such as resilience[6]uncertainty,extreme indetermination, and risk are increasingly being used.

For consultants and planners, this means a significant shift in perception, which actualizes the transition to value-oriented systems thinking – from discrete, object-based analysis of development to a systematic, holistic perception, from objects to relationships, from content to patterns. Accordingly, professional consulting, planning and design of spatial development acquire an interdisciplinary character, relying on knowledge in the field of infrastructure development, agronomy, water and forest management, etc.In this context, the principles and approaches of inclusive sustainable development are of fundamental importance[7] [Fomenko et al., 2016], as well as a deep understanding and wide application of natural solutions based on the analysis and evaluation of services provided by ecosystems (ecosystem services).

[5] Extreme uncertainty is a situation in which any quantitative assessment of expenses and consequences can be challenged, but the choice of the solution option still needs to be made [Tuckett et al., 2020]..

[6] The English-language term "resilience" trace its roots to physics and was first used by T. Young in 1807. Young defined it as the elasticity of materials that, even after being exposed to a certain effect, returned to their original state without harm. It is considered as a property or path to sustainable development in a risky environment [Yunes, Szymanski, 2001; Assis et al., 2006; Rutter, 2007; Busnello et al., 2009; Pike et al., 2010]. In Russian, the most appropriate term is "viability" [Makhnach, 2012], although it does not fully convey the depth and dynamism of this concept..

[7] The principles of sustainable development as the main development paradigm were acknowledged at the level of the world community in 1992 at the World Conference on Sustainable Development in Rio de Janeiro. Russia also expressed its commitment to the ideas of sustainable development. URL: http://www.un.org/ru/documents/decl_conv/declarations/riodecl.shtml.

2.2. THE VIABILITY OF ANTHROPOLOGICAL AND NATURAL SYSTEMS AS A BASIC FRAMEWORK FOR CONSULTING, PLANNING AND PROJECT ACTIVITIES

According to the system concept of life any human-dominated ecosystem is a constantly evolving living organism, the laws of survival and development of which were formed over billions of years of evolution and which periodically passes through a state of phase transition (bifurcation point) before a new stage of dynamic stability. Therefore, the maintenance of its healthy state should be approached very carefully, with deep respect for the unknown. In HDE, the human being is not a creature that "accidentally fell out" of nature and confronts it;moreover, they play a dominant role, unfortunately simplifying and sometimes destroying ecosystems and creating new ones that were previously impossible, including dangerous contacts with wildlife[8]. Guided by their own goals, a person consumes, preserves, and creates ecosystem services.

The success of maintaining the viability of human-dominated ecosystems depends fundamentally on the behavior of individuals and their communities in a particular place and time. The human activity function is most clearly manifested in the territories of climatic disasters (the Aral Sea region, etc.), where the situation is either close to a systemic phase transition, or the human-dominated ecosystem which having made such a transition is in search of a new level of stability [Fomenko, Fomenko, 2020].

The establishment of viability depends not so much on the technical capabilities of humanity, but on the ability of the mind to master new strategic meanings of conservation, restoration, and even the creation of new human-dominated ecosystems. Moreover, according to experts, the core of global development issues is fundamentally related to meaning formation [Von Weizsaecker, Wijkman, 2018; Nazarethyan, 2018], where the leading role is played by the worldview, the nature of thinking, the dominant system of values and norms, etc. This increases attention to behavioral aspects at the level of individuals and local communities. In the expert environment, viability usually focuses on two main groups of factors to ensure it: risk factors and protection factors. According to M. Poletto and S. Koller, risk factors reflect potentially negative situations and cause a decrease in adaptive capabilities in a changing environment [Poletto, Koller, 2008]. Among the protection factors are: individual factors related to the ability to solve problems independently in keeping with their resources; family factors; support of people on whose help one can rely in difficult times; social environment – factors that increase the sense of security and stability in relation to friends, mentors or other decision-makers [Assis et al., 2006]. In the activity aspect of ensuring viability, there are three main subject areas: (1) readiness and safety, (2) response and adaptation, (3) recovery and adjustment [Bhamra et al., 2011]. This means preserving undisturbed ecosystems and restoring ecosystems that have been largely disrupted by human activity. A separate direction is the creation of new viable anthropologically modernized systems, where an artificially created environment dominates.

2.3.FEATURES OF DECISION-MAKING IN CONDITIONS OF APPROACHING EXTREME UNCERTAINTY

In conditions of approaching radical uncertainty, targeting support for the most preferred scenario for the development of human-dominated ecosystems becomes dramatically more difficult, since the facts are uncertain, the stakes are high, and decisions are urgent. Unfortunately, classical science is not able to provide experimentally based theories in response to this. In practice, managers have to choose whether to follow the so-called precautionary principle[9] or act quickly and decisively, without trying to accurately justify marginal costs and expenses [Weitzman, 2009]. Thus, with the growing fears of climate uncertainties and natural vulnerabilities (repeatedly reinforced by the reality of multiple failures of risk management in the COVID-19 pandemic), the search for approaches that help narrow the range of solutions has become more urgent. In relation to professional consulting, planning and design of spatial development, the following ones deserve the most attention.

The concept of Post-Normal science (PNS)[10], where the value component (the sphere of post-normal science) is brought to the fore with an increase in the importance of the sustainable development goals. In PNS, the principle of quality, understood as a contextual property of scientific information, is seen as central to the management of uncertainties, for which new norms of evidence and discourse are applied, where knowledge is distributed to equal communities, involving all who have the desire to participate in solving relevant issues. There is no clear distinction between "expert" and "non-professional" knowledge – they are all required to enrich the understanding of the whole. The organization of work can take a variety of forms – focus groups, consensus-seeking conferences, etc., without trying to define unifying conceptual frameworks or create closed boundaries in the field of research. Unity in the search

[8] Consumption of wild animal meat, new plants and insects, keeping wild species in captivity, "feeding" wild animals in unorganized junkyards of household garbage, etc.
[9] This principle is intended to eliminate uncertainty and risk in cases where the lack of evidence and incompleteness of scientific knowledge have global consequences.
[10] Proposed by S Funtowicz and J. Ravetz, [Funtowicz, Ravetz, 1993; 1997].

for a solution is formed from an ethical commitment to solve a problem, and not from a common knowledge base [Funtowicz, Ravetz, 1993], thus ethical values and responsibility form the basis for solving problems through dialogues and the development of appropriate measures. PNS is largely keeping with the concept of post-non-classical science [Stepin, 1992a], which explicates the relationship of intrascientific goals with extrascientific, social values and goals [Stepin, 1992b]. Accordingly, the post-non-classical "complexity" concept of a sustainable spatial development is necessarily included in the context of such concepts as the information society, the network society (M. Castels), the risk society (U. Beck), reflexive society, responsible society (A. Etzioni), knowledge society, communication society (N. Luhmann), etc.

Conviction Narrative Theory, CNT is based on the human ability to organize their experiences through narratives and uses inherent in the people emotions: it is important to feel the conviction of motivation for actions due to the emphatic and memorable means of expression, which provoke the moral imagination but are not true in a very real sense and are always open to numerous interpretations [Greenhalgh, 2016]. Thanks to CNT, a deep value-based, sociocultural awareness and understanding of the possibilities and meanings that people find in their life practices are revealed. With the help of the narrative, the broadest, most differentiated and complex contexts of life experience, the historical evolution of decisions made in the context of the responsibility category are comprehended. Narratives enable individuals to draw on their beliefs, causal models, and rules of practice in order to identify areas of uncertainty in which to act, model the future results of their actions, and feel confident enough to act (Scherer, 1984).

The Dynamic Causal Model (DCM) is based on the productive idea of K. Friston which says that the most important function of the brain is to constantly solve problems of uncertainty [Friston, 2009]. The life of the individual, the local community, and humanity as a whole depends on how well the brain of each of us succeeds in solving such problems. Million years of evolution have organized the work of the brain of Homo sapiens so that it is still coping with this, because it has learned to effectively summarize information by identifying causal relationships. To do this, it constantly searches for solutions to ensure viability, usually in conditions of insufficient and inaccurate information [Friston, 2009; 2016]. DCM does not look for statistical relationships between the measured time series; instead, it seeks to simulate a biophysical model of the brain that transfers latent states into predicted dimensions[11],representing an open generative model of how the observed data was obtained [Friston, 2009].

2.4. THE BEHAVIORAL MODEL OF THE "RESPONSIBLE PERSON" IN THE BASIS OF MODERN PROFESSIONAL CONSULTING, PLANNING AND DESIGN OF SPATIAL DEVELOPMENT

The main actor in the human-dominated ecosystems is a person. Spatial development is always associated with its activities, and professional consulting, planning and design inevitably affect the issues of its goal-oriented behavior. Modern professional consulting, planning and design in the field of spatial development require an understanding of human behavior in the environment, with its motivation to care for future generations and nature, and a willingness to act in conditions of high risks and uncertainties. The corresponding model of the "responsible person" in relation to environmental management in the framework of conceptual approaches to sustainable development [Fomenko, 2004] is based on the proposed by H. Jonas imperative of responsibility, which states: "Act in such a way that the consequences of your actions are compatible with the solidity of human existence" [Jonas, 1984].

The new professional consulting, planning and design of spatial development using the behavioral model of the "responsible person"[12] (BMRP proceeds from the fact that the individual, through compliance with moral rules within the established cultural norms and traditions, compensates for his/her partial irrationality and incompleteness of information; the responsible person is ready for voluntary joint activities in the interests of present and future generations. Their motivation is determined by two groups of factors – preferences and restrictions. Preferences characterize the value and goal settings of an individual, their subjective needs and desires, and restrictions – objective opportunities and moral prohibitions. All of them reflect a holistic worldview of the preservation of living systems – humane, but free from anthropocentrism and open to development, valuing sustainability and responsibility for the lives of future generations. It is this change in thinking that is called epochal and defined as a key task for the survival of humanity[13] in the report of the Club of Rome, 2018 [Von Weizsaecker, Wijkman, 2018].

[11] Friston based DCM on two important concepts. The free energy principle states that the brain will attract the resources needed to reduce uncertainty in any given time period. The second concept is called the Markov blanket, a concept used in various fields of knowledge (Bayesian statistics, control theory, etc.): all living things require boundaries in order to survive, and the Markov blanket is the mathematical definition of this boundary.

[12] Proposed by G. A. Fomenko. The behavioral model of the "responsible person" develops the methodology of behavioral geography, synthesizes the models of neo-institutionalism and socio-economics.

[13] It is absolutely true that the report puts forward the idea of a "new Enlightenment", since it is about the need for a significant change in the trends of economic activity affecting the entire planet..

Within the framework of the BMRP, value-based motives and moral constraints are not considered secondary to the priorities of economic rationality, thereby expanding the understanding of moral incentives to ensure viability. A responsible person takes care of future generations, since they are able (within certain limits) to integrate individual goals of economic activity with the moral values inherent in society; they consider environmental norms, traditions and customs (which are formed in specific territories with their natural and socio-cultural characteristics) as flexible and commonly followed rules. BMRP is promising for justification and decision-making in conditions of approaching extreme uncertainty, since it includes the motivation for decision-making based on the socio-cultural representations of people and their communities, their inherent narratives that have the potential to anticipate trends in human-dominated ecosystems.

3. RESULTS AND DISCUSSION

In the situation of high-risk and uncertainties, the process of professional consulting, planning and design of spatial development is a sequential solution of geographically specific problems of the viability of a complex human-dominated ecosystems in the conditions of insufficient information, fast or non-linear changes in all spheres of life, especially those caused by the threshold condition of ecosystems or biodiversity [Chapin et al., 2000] using limited resources. At the same time, the socio-ecological priority as the need to fit our ever-increasing needs into the natural capabilities of human-dominated ecosystems, which was originally laid down as the basis for the concept of sustainable development, remains relevant and its significance is only growing.

In an "empty" world, there are many opportunities for developing the environment – new territories, natural resources, natural complexes, etc. The development of each subject (industrial enterprise, business structure, local community, humanity as a whole) has a certain margin of safety – the regulatory ability to increase its ecological footprint without a catastrophic threat to climate and environmental safety, since the permissible ecological capacity of the territories is not exceeded. A global phase transition in such a world is extremely unlikely and belongs to the category of uncertainties (collision with a comet, etc.). The methods of analysis and techniques of decision-making are based mainly on the mechanistic concept of T. Hobbes of the natural and social worlds, where nature and society are mechanisms whose functioning is largely amenable to scientific prediction and control. Natural and scientific knowledge provides an information base for increasing productivity and innovation in technologies and goods, as well as rational decision-making using the behavioral models of administrative person and economic person. Forecasting of most processes is carried out within the framework of classical scientific rationality on relatively stable parameters based mainly on linear dependencies; future scenarios are the organic development of past trends. Efficiency and effectiveness are evaluated according to socio-economic criteria, and climate and natural vulnerabilities are considered as external constraints. Methods of simulation modeling, in particular Monte-Carlo Simulation, are widely used as a synthesis of methods of sensitivity analysis and scenario analysis based on probability theory.

In a "full" world, the challenge is to help businesses, governments, and communities to adapt to the new challenge – the inevitability of increasing risks and uncertainties (even critical ones) and the acceptance of the fact that the future can be never fully measured and managed. The possibilities of increasing the ecological footprint are almost exhausted; the vast majority of ecosystems have been transformed into human-dominated ecosystems and in many of them the margin of safety has been exhausted; further increase in anthropogenic loads (in land use transformation, greenhouse gas emissions, industrial pollution, loss of biodiversity and landscapes, etc.) is associated with irreversible consequences with unpredictable systemic changes. In accordance with the conceptual differences described above, we can identify the main characteristics and features of professional consulting, planning and designing of spatial development in the transition from an "empty "world to a "full" one (Table 1).

Professional consulting, planning and design of spatial development, being focused on multi-scenario, are implemented as a systematic type of mental activity, which is based on the ethics of responsibility, foresight and increasing the humanity of decision-making. They acquire new features:

- focusing on the uncertainty of future events. Application of indicators that can track the main future development trends;
- the special role of intuition and imagination, which in the conditions of extreme uncertainty during the phase transition can become important tools for the perception of reality; reliance on the traditions of the viability of the local population, consideration of the geographical conditions and socio-cultural characteristics;
- increase of interdisciplinarity, involving a wide range of actors in the process of analysis and decision-making, primarily the carriers of unique knowledge;

Table 1
Features of professional consulting, planning and design of spatial development in the conditions of "empty" and "full" world

	"Empty" world	"Full" world
Why?	Ensuring the industrial revolution and industrialization in the conditions of the "empty" world, mastered by human The need to reduce the negative impact of economic activities on natural ecosystems Prediction Capability	Awareness of the increasing complexity of the world, its limitations and completeness ("full" world), the interdependence of all systems on Earth The need to address the challenges of inclusive sustainable development (improving viability) in the context of accelerated post-industrial transition with increased instability and risks, extreme uncertainty The inability to quantify the consequences of crises (economic, etc.) and the real costs using known methods
How?	Considers an object or process Addressing technical issues that push back or leave unanswered critical phenomena associated with increasing uncertainties and risks. Others are expected to deal with political, ethical, and social issues.	Takes into account the entire system in which the object or process will be used Acceptance of the multi-scenario future, the multiplicity of rationalities. Recognition of the importance of value paradigms and consideration of socio-cultural characteristics as compensatory mechanisms for decision-making to improve resilience. Interaction of experts in various disciplines, the use of non-expert knowledge and narrative judgments
When?	The degree of uncertainty is insignificant, and the stakes of solving problems (the level of possible losses) are relatively small	The degree of uncertainty is high, and the problem-solving stakes (the level of possible losses) are significant (or not even approximate due to their extremely high level).
Who?	Plato, F. Bacon, A. Saint-Simon (as the forerunner of technocracy), T. Veblen, J. Burnham, W. Rostow, D. Galbraith, W. Beck et al.	Aristotle, I. Kant, F. Schelling, A. Bogdanov, L. von Bertalanffy, I. Prigozhin, U. Maturana and F. Varela, F. Kapra, S. N. Bulgakov, V. S. Solovyov, N.N. Moiseev, V.S. Stepin, etc.
What is it based on?	Classical science, positivism, often reductionism, and mechanical philosophy Behavioral models of "economic" human or "administrative" human	Theory of living systems, quantum physics, neoinstitutionalism and socio-economics, synergetics, post-science. Behavioral model of the "responsible person"
What is the focus?	The state and interaction of natural systems (ecosystems) and social systems. Change of the state of the affected objects. Methods of changing the state of objects of impact – reduction, elimination of damage to natural objects, etc. Priority of technical solutions	Complex human-dominated ecosystems formed as a result of long evolution and constantly changing over time. Interrelated sources of threats, uncertainties and risks, including global ones Both technical and non-technical issues are considered synergistically
Which data?	Emphasis on the application of information about: (1) the state of natural and anthropogenic objects at a particular time, (2) the interaction and mutual influence of natural and anthropogenic objects, (3) past and future changes in their state	Emphasis on information about: (1) connections and interactions within a complex non-equilibrium dynamic human-dominated ecosystem, (2) possible changes in the state of the system in a changing external environment and increasing uncertainties and risks

- giving additional flexibility, the ability to develop alternative plans and rapid response systems;
- identification and study of possible destructive events;
- focus on identifying and supporting scenarios focused on achieving the sustainable development goals.

In this interpretation, professional consulting, planning and design of spatial development are integrated into the more accurate name - "Sustainable Ecosystem Design", SED, which provides for the implementation of the sustainable development goals, focusing on the regenerative development of ecosystems as a comprehensive response to the loss of biodiversity and climate change, recycling of energy and waste, etc. As an interdisciplinary approach, it provides for the territorial synthesis of knowledge and information and the creation of multidisciplinary teams, provides for the geographical specification of the choice of basic spatial planning methodologies and the systematic application of institutions (tools) for regulating ecosystem services, applies mapping and visualization of spatial sustainable development processes, organizes integrated, consistent (Step to Step) decision-making and its implementation [Fomenko, 2020].

SED provides a targeted orientation to the implementation of systemic approaches to inclusive sustainable development (as a sphere of formation of target attractors) with a special emphasis on improving viability, identifying socio-cultural features and traditions that contribute to sustainable innovative development, and relying on them when choosing scenarios for improving viability. Special emphasis is on the consideration of natural resource problems through the prism of sustainable development and the viability of human-dominated ecosystems in an unstable external environment, on the preservation, restoration and creation of new flows of ecosystem services. Thus, the competitiveness of economic activity increases, and new opportunities for timely response to the conditions of a rapidly changing market environment appear. In the field of management, the range of solutions choice that are acceptable in specific socio-cultural and institutional conditions is expanding, and tools for early detection and prevention of social conflicts caused by changes in access to development resources for present and future generations are emerging.

The "full" world is not universal, its conditions vary greatly from region to region. Therefore, in the work of consultants, planners and designers, the identification and understanding of the unique, special and creative come to the fore. Each human-dominated ecosystem is unique, consulting and design methods are selected and adapted in practice and are largely determined by the context. For example, in some cases, decision-makers will want to know how sustainable the management of ecosystems is and whether they are being degraded. In other situations, they will be interested in information about what ecosystem services are important for the local population and how to provide for this in spatial development documents.

The unifying principle of sustainable ecosystem design should be the restoration of the structure and functions of ecosystems, as well as the associated provision of ecosystem services. Ecosystem services restoration activities[14] rely on knowledge in engineering, application of natural solutions [Guidance.., 2020], spatial development, agronomy, water and forestry, etc. As uncertainties and risks increase, the importance of dialogue [Funtowicz and Ravetz, 1991], involving all stakeholders who have unique knowledge – from different perspectives and in relation to different aspects of the problems also increases. At the same time, the differences in the competencies of external experts and residents (carriers of unique local knowledge and practices of viable economic activity) are being reduced; the importance of organizing the process of discussion and developing collective solutions, and attention to the socio-cultural traditions of place-development is increasing..

4. CONCLUSION

With the increase of riskogenics in the life of mankind, the increase of uncertainties (climatic, natural, etc.), the need for a deep rethinking of the theory and practice of professional consulting, planning and design of spatial development increases. At its core, such changes are associated with the end of the era of the world open for further economic development and expansion, and the difficult adaptation to the conditions of "full" world, when environmental and social problems come to the fore and cannot be relatively painlessly solved by resettling peoples on unoccupied lands.

It is necessary to recognize the inconsistency of previously applied methods with the needs of achieving the sustainable development goals and, as a result, the need for significant changes in professional consulting, planning and design of spatial development, considering them as a special type of intellectual activity. At the same time, the focus of activity shifts to the preservation and improvement of the resilience of human-dominated

[14] The actual flow of ecosystem services depends on the interaction between the ecosystem's ability to provide services and the demand from society. The interpretation of these components varies depending on the type of service (e.g. provision or regulation). The provision of ecosystem services is sustainable when the flow does not increase pressure or degrade throughput capability. Regulating the flow of services is an activity that aims to reduce pressure on ecosystems.

ecosystems, which implies responsibility, humanity, inclusiveness and sensitivity to the variability of the world, recognition of the non-linearity of development and special attention to the behavioral aspects of decision-making. With regard to the private and corporate sectors of the economy, it is necessary to focus on improving the resilience of companies and corporations in situations of high uncertainties and risks, primarily climatic and natural. It will be difficult to choose a system of target priorities, review measures of spatial development and corporate tools.

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