

MSC 93A30

SUSTAINABLE DEVELOPMENT OF A SOCIETY: SYNERGETIC APPROACH

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The article examines the paradigm of "sustainable development of a society" from the standpoint of the modern post-non-classical stage of development of society scientific knowledge.

Key words: sustainable development of a society, synergetics, synergy, low synergy, high synergy, well-being society, self-organizing society, network society

Introduction

The essence of the paradigm "sustainable development of a society" is the most adequately represented on the basis of synergetic approach. On the one hand, this paradigm is the expression of reliability and efficiency of functioning of a society, its main institutes, values and norms. On the other hand, it is the reflection of society consciousness in its attempts of survival and self-preservation that is a unity of objective and subjective factors of social and historical processes.

From our point of view, the methodological basis for formation of the paradigm of sustainable development of a society is the "synergy" approach. We shall represent this approach in its social-humanitarian interpretation given, in the first place, by R. Benedict and A. Maslow and in modern theories by G. Haken and I. Prigozhin .

First of all, what is the sustainable development of a society and what are its main parameters? To our mind, and we agree with B.Kh. Bgazhnokov, sustainable development is "relative consistency, harmony and predictability of positive changes in all the spheres of social live: in everyday life, in industries, in social environment, in perception and interactions of people"[1].

Parameters of sustainable development of a society

In terms of the main parameters of sustainable development of a society we imply:
firstly, predictable and regular dynamics of changes for the better;
secondly, high political culture and inflexible political will of the government;
thirdly, social order providing favorable conditions for personal and social live;

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fourthly, constant improvement of basic personal qualities by digestion of the main moral imperatives and judgments of democratic system and so on.

The sustainable development of a society stands against an unsustainable development which is characterized by instability and constant crisis in all the spheres of life, particularly, in economic, social, political and spiritual spheres. It loosens the society causing anxiety and angst, distrust of people to each other, to the activities and promises of government.

Sustainable development of a society cannot exist without a certain ideal which would reflect their hopes and their highest spiritual motivations. From this point of view, an ideal is the realization of the unity of objective and subjective patterns of the desirable well-being society. Such a society should be save and comfortable for a person. It should create the conditions for complete realizations of creative energies and skills.

The main fact in the presented problematic discourse is the understanding that the feelings of well-being, balance of mind and comfort appear in the conflict of the present social living with planned and desirable, in the interaction of formed social expectations with the reality. On this count, the state of social well-being plays the main role. "Social well-being is a subjective feeling of living depending not only on objective characteristics of existential space but on subjective ideas of happiness, success, social well-being formed in the course of socialization"[1]. Social well-being is a synonym of "well-being society"here.

Well-being, in the authors' opinion, corresponds to the notion which may be compared with *highly synergetic society*, that is *the society with high social synergy*, according to Benedict expression. Though Benedict writes about the differences in human cultures, about cultural eposes, this notion plays a significant heuristic role in the understanding of social processes in terms of its meaning in the paradigm of modern post-classical science.

At first, we should understand what "synergy" in Benedict interpretation is and what its low and high forms are. It will allow us to make a comparative analysis with their modern interpretation.

Benedict applied the term "synergy" and described her conception in a cycle of lectures which were presented in Bryn Mawr College in 1941. This term determined the degree of interpersonal relationship and harmonious relations inside a society. From here the term was applied to denote such joint activity of separate individuals when the obtained final result exceeded the sums of the results of separate work of each concrete person.

Benedict's student, A. Maslow, who became a famous American scientist, the founder of Humanitarian Psychology, separated individual synergy. Identification of oneself with other people helps to develop high individual synergy. The success of another person that brings deep satisfaction to an individual is interfaced with the offer of generous support. In fact, it is a combination of egoistic and altruistic motivations. Helping and supporting another person, an individual seeks and finds personal satisfaction.

Ideally, individuals do what they should do because they want to do it. In this case, the best medicine is not only effective but tasty as well. Along with it, "synergy" is treated not only as a definite form of arrangement of activity structures but also of social structures. However, as it was afterwards grounded by Haken, we should realize "that the existig synergetic forms of arrangement cannot be found in the material world, it is not some kind of a personality. They are rather ideal constructs which effect individual behavior of people"[2].

In this context, it turned out to be possible to introduce such ideal constructs as "low synergy" and "high synergy" to investigate social and cultural systems. These constructs allowed us to come out to a post-non-classical methodology for investigation of complicated, in particular, social systems. Benedict wrote that "I shall speak of cultures with low synergy where the social structure provides for acts that are mutually opposed and counteractive, and of cultures of high synergy, where it provides for acts that are mutually reinforcing one in the case if its social structure causes opposition of some it its members to the actions of others. I spoke of societies with high social synergy, where their institutions ensure mutual advantage from their

undertakings, and of societies with low social synergy, where the advantage of one individual becomes a victory over another and the majority who are not victorious must shift as they can"[3].

A well-being society, the society with high synergy, should have such social institutions which promote the overcoming of the opposition between the right and wrong, egoism and altruism where an individual, pursuing his or her own egoistic goals, realizes altruism and deserves a reward in fact. A society which rewards the right is a society with high synergy. It is important to note that in the relation to human societies, the notions of "high synergy" and "low synergy" are less evaluative and more objective and give fewer grounds for subjective interpretations.

Wide penetration of high synergy into social life is expressed, for example, in charity. This society shows great generosity together with kindness and reliability. On the other hand, there are institutions in the modern society which activity in one way or another contributes to turn people against each other making them rivals and competitors. These institutions provide the conditions when people have to fight for goods when their resources are limited.

The conception of "synergy" is very important not only in the investigation of social and cultural systems on objective grounds, not only by the perspectives in new understanding of over-cultural system of values, but for the investigation of the dynamics of development of separate social systems and the human society in whole.

A quarter of a century after the Benedict's lectures where she presented the conception of "synergy" a German physician-theoretician, Haken, introduced the term of *synergetics* as a name for a new interdisciplinary direction of investigation of self-organization phenomena. Self-organization is understood as a process of arrangement (space, time or time-space) in an open system due to the consistent interaction of a set of its elements [4].

Originally, the synergetics was aimed at the investigating of natural processes, in particular, laser radiation by Haken and autocatalysis phenomenon by Prigogin. However, detection of general regularities in self-organization phenomena of different nature, physical, chemical, biological, led to the understanding of the possibility of application of the synergetic paradigm to investigate social processes. Thus, Haken wrote a paper "Self-organizing society" the main parameters of which may be associated with a society with high synergy, the society, partially corresponding to the current one. Haken writes that what we will do in the future will be defined not by a high level of technological development but by sociological constructs, in particular by finding a consensus in social context [2].

To understand Haken's ideas, we refer to his work "Synergetics"[4], where he suggested a model reflecting the principle of obeying of order parameters, illustrating the main role of a definite parameter in some context of self-organization process. The general character of this model, to Haken's opinion, allows us to apply it to social self-organizing systems.

Mathematical model of social self-organizing system

The model is a system of ordinary differential equations relating the parameters q_i , ($i = 1, 2, \dots, n$):

$$\begin{aligned} \dot{q}_1 &= -\gamma_1 q_1 + \varphi_1(q_1, \dots, q_n), \dot{q}_2 = -\gamma_2 q_2 + \varphi_2(q_1, \dots, q_n), \dots, \dot{q}_m = -\gamma_m q_m + \varphi_m(q_1, \dots, q_n), \\ \dot{q}_{m+1} &= -\gamma_{m+1} q_{m+1} + \varphi_{m+1}(q_1, \dots, q_n), \dots, \dot{q}_{n-1} = -\gamma_{n-1} q_{n-1} + \varphi_{n-1}(q_1, \dots, q_n), \\ \dot{q}_n &= -\gamma_n q_n + \varphi_n(q_1, \dots, q_n), \end{aligned}$$

where $\varphi_1, \dots, \varphi_n$ are nonlinear functions of the variables q_1, \dots, q_n , not containing constant or nonlinear terms, $\gamma_1, \dots, \gamma_n$ are damping constants and all $\gamma_1, \dots, \gamma_m$ are many times less than any $\gamma_{m+1}, \dots, \gamma_n$. Thus, the parameters are divided into two groups: weakly damping (with the index from 1 to m) and rapidly damping (with the index from $m+1$ to n).

Haken calls *order parameters* are those which subordinate other parameters (but assumed that some from q_1, \dots, q_m may be unstable, that is possible when $\gamma_i < 0$). In a more general case, the values q_1, \dots, q_n are assumed to be vectors. In this case vector q_i reflects the state of the i -th subsystem. If we take such organizing factors as social institutions as order parameters, the model of interaction of separate factors should reflect a competitive character of their interaction, overcoming of which results in the self-organization as the future of the human society.

What are the advantages of a self-organizing society? What are the factors of its formation and mechanisms of its functioning? All these questions are the answer for the main question. What spheres of public life require government regulation and control and where these forms may be changed by self-organization?

The main motto on the way to the self-organizing society is "Denationalization everywhere". This denationalization concerns government property, institutions of justice, education, power supply, transport and so on. In this process, the direct governmental control is eliminated which, in its turn, should lead to the increase of the feeling of freedom.

Conclusions

Undoubtedly, a self-organizing society gives the possibilities to extend the space for free activities of individuals with minimal governmental control (and even without any control). However, these possibilities, as external conditions, act as control parameters. The effects of these control parameters may result not only in stable society but in instability in the society, so we must know that the results of the decisions how to overcome the instability are not predetermined and not unequivocal from the point of view of synergetics.

While for Haken, a well-being society of stable development is a "self-organizing society for Prigozhin it is a becoming "network society" based on self-organization. Prigozhin sees the basis of the paradigm unity of a network and self-organizing society in the analogy between the evolution in the direction of a network society and self-organization processes in physics and chemistry. Indeed, nobody planned a network society and information burst. It is a notable case of spontaneous appearance of new forms of society [2]. Prigozhin also states: "We should remember the constructive, positive part of the technological revolution that is decrease of the inequality." Unfortunately, Prigozhin does not give more extended explanation of a network society in the line with the synergetic paradigm. He only emphasizes the assumed effect which it will have on the humanity. He writes: "I think, that the future network society will be evaluated by its impact on the inequality between the countries. Of course, a network society has well known advantages. But I think, we should judge by more fundamental criteria"[2].

On the strength of new communication opportunities, the modern society has a tendency of development from domination of hierarchic structures in all the spheres of society life to structural network ones with prevailing importance of realization of personal needs of individuals. However, this network individualism is associated with self-organization processes concerning different spheres of people life when the mobility and the flexibility of individual activity forms increase.

At present, a network becomes a form of social organization of a post-industrial society. Real existence of such a network is revealed not in a local space, where elementary cells of a network are formed, but in the global world. It gives the networks a new communication effect which could not have been achieved within the previous epochs. But this synergetic effect which is not so great will have much significance for the future.

Elements of this investigation, from our point of view, demonstrates that the substantiation of heuristicity of the paradigm "sustainable development of a society" may be fruitful in the context of "synergy" concept.

References

1. Bgazhnokov B. Kh. Kul'turnye osnovaniya ustoychivogo razvitiya obshchestva [Cultural framework of sustainable development of society]. Materialy regional'noy nauchno-prakticheskoy konferentsii «Kul'tura kak faktor stabil'nosti na Serernom Kavkaze» – Proceedings of the regional scientific-practical conference "Culture as a factor of stability in the North Caucasus". Nalchik, September 24, 2013.
2. Haken H. Samoorganizuyushcheesya obshchestvo [Self-organizing society]. <http://spkurdyumov.narod.ru/Haken51.htm>.
3. Maslow A. G. Dal'nie predely chelovecheskoy psikhiki [The farther reaches of human nature]. St. Petersburg. Evrazia. 1999. 432 p.
4. Haken H. Synergetics. Moscow. Mir. 1980. 405 p.

For citation: Shevlov V. A. Sustainable development of a society: synergetic approach. *Bulletin KRASEC. Physical and Mathematical Sciences* 2016, vol. **13**, no **2**, 57-61. DOI: 10.18454/2313-0156-2016-13-2-57-61

Original article submitted: 02.06.2016