Categorical and Criteria Basic of National Security: Inter-Disciplinary Approach

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Abstract: The need to improve the theory-methodology basis of national security (NS) and to maintain world strategic stability due to this is caused by the struggle nations toughening for the depleted natural resources. This fact, as well as the aggravation of the international terrorism problems and the collapse of the bipolar interstate relations system, along with the appearance of the Internet, artificial Earth satellites and intercontinental ballistic missiles having removed the national borders impenetrability, demand of reviewing the content of the NS and the maintenance activities to its ensure.

This report founded on the objective laws of nature and society allowing to formulate the energy-entropic concept of the objectively existing dangers and to divide it into the three base classes. According to this concept author succeeded specify the NS categories: NS is nation’s ability to meet the needs necessary for self-preservation, self-reproduction, self-improvement with minimal risk for its territory and way of life and NS object is ethnosystem (ethnos - population, geo - territory, ethnos - folk customs, traditions and beliefs), and also the list of the cross-disciplinary methods of the NS system research and ensure and NS integral indicators (the nation’s vitality, nation’s life quality and expenses to maintain the vitality of the nation).

Keywords: categorical thinking and modeling, energy-entropic concept, NS system research and program-goal management.

I. The Importance and Structure of Paper

The concept NS still has no generally accepted definition, despite the 70 years after appearance [1]. This circumstance has a negative impact on development of the appropriate theoretical and practical tools. As for the reasons for the lack of clear content of NS there are both objective and subjective factors among them. The first group ones should include the inter-disciplinary nature of this concept and its complexity which requires specifying the victim and the source of the threats to it, and also the large coincidence between the activities volumes in field of NS and of the state’s policy. And their second group is referred to by definite politicians’ intent: the uncertainty of this important category content allows covering up someone’s purely personal interest by alleged state interests.

The relatively new factors that have arisen in recent decades caused an unprecedented surge of attention to the essence of the NS concept and to the need for its clear understanding. These factors include a number of achievements in scientific and technological progress, such as the appearance of the Internet, artificial Earth satellites and intercontinental ballistic missiles having removed the national borders impenetrability. And also collapse of the bipolar international relations system took place due to the breakup of the USSR and the world socialist system. There should be also mentioned aggravation of the international terrorism problem caused by the growth of interethnic and inter-confessional conflicts.

These circumstances as well as the intensification of the "all against all" struggle for vanishing non-renewable natural resources of the Earth have prompted the article author to share his thoughts on the above-mentioned aspects. They concern not only the meaning of NS and organically related categories, but also the composition of the most appropriate tools for scientific and practical activities. These were just the original ideas of the author that determined the structure of this publication.

More specifically, the article begins with the fundamental substantiation of composition and content of the preconditions from which strictly logically (deductively) are follows the energy-entropy interpretation of the origin and of division of all the objectively existing dangers, as well as the definition of such categories, as NS, object and subject of the relevant professional activities. Then author discloses the structure of the NS methods, principles, indicators and assessment criteria.

II. Preconditions and Terms of the NS Concept

As regards the most general laws of being, they are as follows [2]. The world is material; the conservation laws make its objects unchanged by quality but changed by quantity, and the laws of variation lead them to a new quality by transforming the quantity. Due to these facts, in the nature everything is continuously changings and “conservation” in her is possible only through “change”. The source of any changes is energy, and its flows divide all objects on the equilibrium and non-equilibrium. In addition the world around us is consists of individual and group objects. The behavior of the first is random, but second ones - determined. Human activities are also subjected to objective laws reflecting trends of increasing labor productivity, free social time, intelligence and spiritual freedom [3]. Besides, the person activity is specified by the needs, and their satisfaction requires of the social time costs.

When elucidating the essence of such NS category as an object, we have in mind that the relevant professional activities must be connected with a system comprising at least two parts. One of them is a nation and the other is the source of some threats that could impede it life activity in any way. More specifically, the long-term conservation of the nation vitality is achieved due to survivability, stability and resistance to the effects of dangers, threats and challenges which adversely affect the interests, values and needs required for nation’s normal life.
The above terms placed in the rhomb faces shown in the middle part of Figure 1, and all their essential features – in the according rectangles. So, all the information available there allows definition contents of any NS categories.

Let us define more precisely the content of the terms enclosed in the rhomb with main attention to those of their properties which are essential for nation's vitality. Therefore a person and the all communities he forms can be considered in the subsequent reasoning as not so much political and social beings as biological ones and their activity can be conditional on satisfaction of needs required for self-conservation, self-reproduction and self-improvement. Under need we mean here everything required for the continued existence of people as open systems, i.e. the energy, material and information flows with the evolutionarily proven parameters, and under the values – appropriate sources or batteries formed of such flows.

In this case it is advisable to divide the intangibles values into a) the generally valid: the universal values – the rights, liberties, and fundamental ones – the truth, justice...; b) the ethos or civil values – the customs, traditions, beliefs, sacred objects and places [4]. The latter values facilitate self-identification and self-determination of every nation and forming a unique way of its spiritual and social life. Vulgarization and substitution of the values by others may bring the nation to a gradual degradation. In contrary the person interests are purely individual and extremely volatile. It is cause of this category can't be legally well-defined. Therefore field for the interest using – is the politics (Greek: πολιτική – many, τικοσ – interests), but not the NS.

III. ENERGY-ENTROPY CONCEPT AND NS CATEGORIES

Nature of objectively existing dangers should be agreed with the energy-entropy concept [5] which explains their appearance not only by dissatisfaction of needs essential for people, but also the presence of the informational, statistical or thermodynamic disequilibrium in according systems and by any attempts to maintain or aggravate her. This explanation of the dangers nature is confirmed by practice and does not contradict the tendency to spontaneous growth of entropy in its informational, statistical and thermodynamic interpretations. Indeed, all attempts to reduce this extent of structural disorder and degradation of relations between the parts of the system would result in increasing the difference of corresponding potentials, which is fraught with the possibility of their uneven equalization in the form of unwanted emissions of energy, harmful substances or confidential information accumulated somewhere.

The energy-entropy concept allows classifying all the objectively existing dangers on the basis of the moving matter being inadequate for someone. Thus it is logical to point on their three base classes: 1) antropogenous-social dangers caused by distortion or intentional concealment of information by people; 2) natural-ecological ones are provoked by violating the natural cycles of substance migration at various natural disasters; 3) technogenic-industrial related to the possibility of unwanted exhaust of the energy stored in the man-made objects.

Speaking about sustainability, stability and vitality, we should note that these people’s abilities are realized thanks to their innate instincts of self-preservation and reproduction. At the same time the people’s security can be achieved only in the following three cases: a) if the potential victim has guaranteed resistance to all adverse effects; b) when the dangers, threats and challenges are absent at all; c) or when their sources are non-aggressive.

Based on the above, it is logical to introduce next definition: the national security is a nation's ability to meet those needs which are necessary for self-preservation, self-reproduction and self-improvement with a minimal risk to the basic values of its future generations; basic values – territory and the way of life of country; risk – measure of danger which simultaneously characterizes the possibility of a damage appearance and its expected size; the NS object – a large and complicated system "country's population - its territory - their way of life", named by the paper’s author “etnogeoetosystem” (ethnos – population, geo – territory, ethos – the folk customs, traditions and beliefs); subject (the main content) of the NS professional activity – objective patterns of the appearing and reducing of the damage to etnogeoetosystem.

The model of the NS object shown in Fig. 2 included not only the nation proper (the country population), but also all what is necessary for her long-term existence.
IV. THE NS TOOLS AND METHODS OF STUDYING

A more precise definition to the NS content and object allows proceeding to the foundation for composition of the NS methods. In this selection we shall proceed from the list of the current tasks and features of considering etnogeoetosystem. Since an important feature of this object is the presence of the components and elements related to the competence of many theory and practice branches, so this points out the interdisciplinary character of scientific tools. This approach to NS research implies the focus on the universal methods used in natural and social sciences; it ensures them a new generalization scale and translation into seemingly incoherent areas.

Therefore, we will apply below a system-goal approach to researching and improving the NS object pointed out above. The use of these tools is usually based on the totality of logically correct conclusions and rational actions that are related only to the most fundamental factors of specific etnogeoetosystem and objective laws of its functioning. Therefore the number of the NS research methods may include deduction and induction, system analysis and system synthesis of the NS on the basis of the categorical thinking [6] and corresponding modeling. And methods of ensure and improve of NS may embrace strategic planning and operative administration, the Mathematical theory of organization [7] and Decision-making, Operation research and the High Hume Technologies.

The structure of the scientific methods to research, ensure and improve the NS listed above is shown in Fig. 3, and their constructiveness is confirmed by a widespread use in the all newest areas of theory and practice. Let us briefly characterize those methods which are quite creative or/and relatively little-known.

The system analysis and synthesis based on modeling are the most suitable for research methods of the etnogeoetosystem as the NS object chosen above. Really, studying this big and complex object, we should find and examine its separate parts in the beginning, and then determine connections between them by synthesizing the etnogeoetosystem integral properties. It means that system analysis makes known the properties of different parts of the NS complex object, while the synthesis already transforms this information into a new quality.

That is why the system analysis can be useful for study of the etnogeoetosystem properties which are most important for the NS. Naturally, the main attention should be paid to the identification of its factors called by the “the order parameters” and “the flow directions” in synergy.

Based on the above, it is logical to believe that system approach of the NS study is the best way to implement in practice such claims as objectiveness, comprehensiveness and concreteness of objects examination, taking into account their development and relationships with the others. The structure of applying it to the NS research is shown in Figure 4 included three interrelated and major phases: a) an empirical system analysis, b) a problem-oriented description, c) theoretical system analysis and synthesis. Taking into account non-obviousness of information only in the last phase, we shall explain the application of the modeling.

As it has been proved by the author [8], the cause-and-effect diagrams in form of “bow tie” [9] are the most constructive for modeling of danger events X in the complex systems. The described diagrams usually contain the danger event X placed at the center and two graph’s models called a) “the accident tree (AT)” located the left, b) “events tree (ET)” – in the right. The AT is constructing by deduction method and includes different preconditions of the X occurrence combined by Boolean logical conditions, and the ET – the possible destructive outcomes of X obtained in the course of inductive reasoning.

The process of the appearance and the negative manifestation of the simulated accident is simulated by the signal moving from the left side of the diagram to its center, and from there to the right side.

These diagrams are suitable both for the quality and quantity system analysis of any danger process. The first allows to identify the conditions are being the minimally necessity and sufficiently for both the occurrence and prevention of a specific accident, while the second – to forecast the respective risk R parameters. Indeed, their equivalent mathematical models allows quantitatively evaluate a) the probability P(X) of the appearance and an average damage M[Y] caused of the danger source; b) the quantity impact of all the factors taken into account by the R indicators; c) the extent of decreasing P(X) and M[Y] expected from the implementation of the activities for
their decrease. For quantitative analysis of the specific diagram it is required to know the possibilities \[10\] of appearance both the initial preconditions \(P_i\) of AT as and ET final outcomes \(-Q_{cj}\) well as the sizes \(Y_{cj}\) of damage expected from each of last.

These parameters can be obtained with the expert survey and then presented by the modal amount of membership functions of relevant indistinct numbers \[11\]. The monograph \[12\] has some information confirming the constructiveness of such complex models and their automated system analysis.

V. THE NS SYSTEM ENSURING AND ITS CRITERIA

The variety of the nation’s needs and values on the one hand, and the threats and challenges having negative impact, on the other, points out the necessity for long-term, systematic and purposeful work for the NS maintenance and improvement. It can be successfully realized only by continuously operating the NS ensuring system – the complex of inter-related regulations, organizational, technical and other activities as well as the forces and means related to these acts and actions.

![Fig. 4. Structure of NS system study](image)

The NS goals, the programs and working mechanisms of the proposed system are shown in Fig. 5 as the set of corresponding elements and connections. Pay attention to the logical harmony and constructiveness of the structure depicted there, and also to fact that among its listed tasks “protection” takes the last place as it is usually delayed response to the threats and challenges having already been emerged. We should also note the fundamental impossibility of creating such system if to define the NS as “interest protection” since this concept can be neither clearly defined nor quantitatively evaluated by any objective methods.

It is logically to consider the NS systematic ensuring should be carried out according to next main principles: the compliance of all state and public activity with the goals of the nation self-preservation, self-reproduction and self-improvement; balanced combination of the required efforts, forces and resources; proportionality of the performed tasks and allocated resources; concentration of the involved forces and resources at the decisive place and at the right time; preference to the political, diplomatic and legal methods in comparison with the military force ones; priority of preventive and precautionary activities to counter threats rather than response to arising emergencies; constant readiness of the available forces and resources to prompt measures appropriated to the scale and nature of the possible challenges; the timeliness and effectiveness of crisis prevention and its danger factors countering; the accordance between the ways of the NS ensuring and the socio-political, scientific, technical and other capabilities of the country.
It is also naturally to believe that to determine effectiveness of this system the quantitative indicators and assessment criteria of the NS level are required. But at substantiation of their composition we should take into account the following requirements: a) the reflection of the specificity both of the own study category and its object and subject; b) the convenience for application in the NS control tasks decided with their help; c) using the experience of quantitative indicators application to evaluate the quality of other complex systems.

Consequently, the integral NS indicators should be visual, universal and sensitive to changes of the ethnogeoethosystem parameters; to reflect her vitality and its dynamics; take into account deterministic and stochastic processes in this system; indicate the NS level and the effectiveness of measures for maintaining it; be suitable for curtailment and aggregation; have limited number of the measure scales.

All set of similar integral NS indicators should be divided into three groups. The first one should characterize the nation’s vitality (health) including 1) the national time volume V[NT] being calculated by the multiplying of the average values of country’s citizens number N on span their life T in a particular period; 2) the national property volume V[NP] (the sum of the results of national production PR and the country’s preserved natural resources) CR; 3) a potential of the nation development DP determined by multiplying the two previous indicators.

The second group of these indicators will reflect the nation’s life quality: 1) the satisfaction degree in citizens’ material needs U[MN], which being determined by the part of the national property owned by each taking into account the coefficient k of it useful application and of the scientifically based standards of consumption; 2) the degree of satisfaction in spiritual needs U[SNI] = kDP/N and of the social justice observance promoting creative self-expression of the citizens; 3) the direction and rate dU[MN+SN]/dt of changes in the degree of satisfaction in material and spiritual needs of the nation as a whole.

The third group may include the expenses to maintain the vitality of the nation and preserve its basic values in the same period of astronomical time: 1) the average costs M[C] on preventing and softening consequences of the possible emergencies (are depended of their probabilities Q; and of the costs Ci on prevention); 2) the average value of the socio-economic damage M[D] from origin of such dangerous situation; 3) the part of these expenses amount (SE) in the country’s national product PR. As for units of measuring the proposed integral indicators, they are only two: a) the dimensionless numbers used to evaluate degree of satisfaction of the nation’s needs and the probability Qi of emergencies appearance in the ethnogeoethosystem, b) the person-days of the national time – to measure all other indicators.

The overall volume of national time V[NT] is the main resource of the nation, and the character of its use has the greatest impact on the nation’s vitality. This resource is advisable to divide into the time necessary for the simple self-reproduction of the nation (for struggle against entropy in the ethnogeoethosystem) and the free one (it is part of all this resource remaining after the end of such a struggle). The structure of the national time and its costs are showed in Fig. 6.

The costs of national time also can be divided into three components [13]: 1) the positive – the share of national time that remains after satisfying the needs of simple reproduction of the nation; 2) the alternative – including the costs of this resource to maintain the country law order; 3) the negative – those that reduce the development potential of a nation and do not contribute to its progressive development. The costs of national time can be divided into three components [13]: 1) the positive – the share of national time that remains after satisfying the needs of simple reproduction of the nation; 2) the alternative – including the costs of this resource to maintain the country law order; 3) the negative – those that reduce the development potential of a nation and do not contribute to its progressive development.

Naturally, the parameters included in the NS integral indicators must to reflect the specifics of all parts ethnogeoethosystem: a) the nation itself – the sex-age's composition, her well-being and quality of social sphere; b) the country territory – the land, sea and air borders impermeability, the infrastructure quality and the volume of natural resources, biological diversity and ecology; c) the way of life – citizens and properties security from criminal assault, preservation of the national culture objects, the social justice level.

The analysis of proposed indicators showed that they meet all the above mentioned requirements. In addition, they are suitable not only for a priori and a posteriori assessment by objective methods, but also for substantiation of the socially

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**Fig. 5. The goal-setting and tools of NS system ensure**

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**Fig. 6. Structure of the national time and its costs**

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acceptable NS level, without which is impossible any purposeful control by its ensuring. In particular, the methods are most preferred to solve this problem: a) to determine acceptable values for the possibility \( Q \) of specific emergencies by comparing it with the frequency of the natural disasters occurrence; b) to set the citizens’ life quality indicators \( U[\text{MN}] \) and \( U[\text{SN}] \) according to the values that have been achieved in the most prosperous countries; c) to substantiate the optimal (by the selected criterion) NS level, for example, on the basis of minimum sum of costs and damage from manifestation of all really existing dangers.

The study of these approaches indicates a purely empirical nature of the first two, which limits their application field due to the unacceptability of foreign experience: nations live under different environmental, climatic and landscape conditions, so the claims to quality and safety of life, for example, on the part of a European and a Muslim are different.

As for units of measuring the proposed integral indicators, they their only two: a) the dimensionless numbers used to evaluate the possibility measure \( Q \) of emergencies appearance in the etnogeoetosystem, b) person-days of national time suitable to measure all other indicators and also value of any costs and damage. We will note also that all the national time costs discussed above can be measured not only in person-days, but also in equivalent amounts of money. For example, according to the International Labor Organization recommendations, the damage caused by the death of one average person is estimated as the loss of 6,000 man-days. The price of every such a unit is determined by the country’s GDP value divided by the amount.

VI. THE NS POLITICAL AND LEGAL ENSURING

As it follows from the above material, regulatory framework considered there represents the first component of the NS ensuring system that establishes the basic principles of the entire state and public activity in this area. Naturally, the one part of these documents should publish by a Head of the state to clarify and familiarize the citizens with implementation of the corresponding policy; the other one to have the status of laws adopted by the country’s parliament and subjected to obligatory fulfillment by all officials and citizens. It is also logical to assume that such ensuring should a) to take into account all factors that have the most significant impact on vitality of the particular etnogeoetosystem, b) to forecast the strategic decisions effect and to counteract concealing the information actual for the NS, c) to bring to justice those officials who are involved in violations of such their duties.

The analysis of the advanced experience in the sphere of the NS political and legal ensuring showed that the document names of the state Head most frequently have the words “concept, doctrine and/or strategy”, and of the Parliament – “the law” or “fundamentals of legislation” with the signs of source of the specify danger or of its potential victim. Taking into account the above stated, it is reasonable to divide the NS political and legal ensuring on the two subsystems representing the subset of a) the regulatory concepts, doctrines and/or strategies of the state Head, b) the legislative acts of its Parliament. The purpose of the first structure is to consolidate the work of the different government branches and contribute to support of this work by the population, and the second one – to set the frameworks in the NS ensure activities the transition beyond which must be stopped and punished.

Realization of the totality of regulations above proposed is to be considered as the creation of whole system which structure is shown in Fig. 7. The NS Concept play there the role of the long-term document of the country Head contained the answers on the following key issues: how he understand the NS, what her place is in his activities, how to achieve the formulated goal in this field and to overcome the possible obstacles. The NS Doctrine – of the medium-term normative act, which includes more specific and detailed answers to the questions related to understanding by the country’s leadership of the basic tendencies and contradictions of the decade, of the NS problems caused by them, of the possible ways of preventing or of parrying of their. The NS Strategy is short-term documentcontented the assessments of the current international and domestic situation, the lists of nation problems to be decided off, and also the NS system resources being adequate to the activities undertaken by them in these conditions.

One can see from Fig. 7, the NS legislative acts of second subsystem also have a hierarchical structure comprising one frame law, six backbone ones and a lot of the target laws. The first document should to regulate relations for ensuring the nation’s vitality, been establish the fundamental principles and mechanisms, the integral indicators and assessment criteria of all relevant activities. In other words, the role of this regulation act can be likened to head law for a given law subsystem. The Fundamentals of legislation acts should to regulate the homogeneous social relations in specific areas of the NS ensuring. Finally, the direct laws intended to implement the most particular function represent the lowest level of considered subsystem of the NS legislative regulations: each of them must systematically regulate the technology of relationships for preventing and/or solving specific problems in own area.

In conclusion of this paper part, we note that the integration of the normative legal and political documents into a single perspective system significantly increase its positive contribution to the NS political and legal ensuring. The main reason for that is the well-known “the emergentness effect”. And the others are specialization and harmonization of relations between the parts of etnogeoetosystem and specific political and legal acts. Indeed, a) etnogeoetosystem vitality as a whole is the object of jurisdiction of the NS Concept and Framework Act and also the NS Doctrine or Strategy; b) procedure of the ensuring vitality of three etnogeoetosystem components and of the struggle with three classes of objectively existing dangers are regulated by private doctrines, codes and fundamentals of legislation; c) the maintaining vitality of all critically important elements of the etnogeoetosystem and countering the most
serious threats to it are achieved with help the goal programs and by the direct action laws.

VII. DISCUSSION AND CONCLUSIONS OF THE PAPER

It is advisable to evaluate the main provisions of the article with the point view of the relevance, originality and truthfulness. To do it is we apply the existing positive experience, and a number of classics statements.

Let us begin by justifying the legitimacy of the proposed NS categories. The need of any clear definition confirms Confucius: "If the words are not corrected, then they will not obey the speeches. If they do not obey the speeches, then the any work will not be executed". As for the all author definitions, we note their consistency to the next criteria of the standard [14]: 1) the suit-ability for the maximum number of situations and for empirical research; 2) presence of connection with the definition of other terms and the closeness to the ordinary language; 3) the desirability of the link with the theoretical propositions which exclude the omission of any important aspects.

It is easy to realize that definition of the NS corresponds to above requirements: it includes the following distinctive features:

- The NS concept – a set of attitudes and common intention the country’s leadership to ensure the vitality of its peoples to preserve and increase the nation’s basic values.
- The NS doctrine – theoretical and propagandistic principles of the NS concept implementation in the medium-term prospect in the following fields:
  - External Political
  - Military
  - Demographic
  - Health care
  - Information
  - Youth
  - Education
  - Resource
  - Financial
  - Business
  - Transport
- The NS strategy – rational action plan to self-preservation, self-reproduction and self-improvement of the nation in the short term.
- The NS law, which regulates the framework provisions of the state policy in maintaining vitality of the nation and the preservation of its basic values.
- Fundamentals of legislation and targeted laws to:
  1) preservation and increase
  2) effectively parrying threats and challenges
  1.1) country’s peoples
  1.2) their way of life
  1.3) country’s territory
  2.1) anthropogen-social
  2.2) natural-ecological
  2.3) technogeneous-industrial

The use of these results totality allows to take into account all the potential victims and sources of their threats in identifying the most important aspects of the NS systemic research and to guarantee NS maintaining her at an acceptable level.

That is why there are grounds to assert that the author’s interpretations of the NS content and object, of the subject and the inter-disciplinary toolkit of professional activity are suitable for fruitful application in practice.

The inverse judgment is possible, according to K. Popper’s "falsifiability principle" [17], only after the opponents presented their strong contra-arguments. Indeed, the author cannot in principle prove the truthful of his results, which follows from the second "incompleteness theorem" of K. Gödel [18].

Hence it follows that in case of absence the disproving arguments all the NS conceptual-criteria propositions given in

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the article are valuable for improving both to ensure and education in the NS field.

VIII. REFERENCES

[15] Available at: https://ru.wikipedia.org/wiki/Национальная_безопасность
[17] Available at: https://ru.wikipedia.org/wiki/Фальсифицируемость
[18] Available at: https://ru.wikipedia.org/wiki/Теорема_Гёделя_o_неполноте