

The Cadastre – A Cybernetic Approach for 21st Century – Sustainable Development and Environmental Protection

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Key words: cadastre, cybernetics, feed – back, sustainable development, environmental protection.

SUMMARY

The interest of the contemporary world in the field of natural and artificial resource optimization, in the extended process of sustainable development and environmental protection, manifests itself through the large number of meetings organized by the UNO, where the major role is played by specialized international institutions.

In this line of thought, the cadastre, as a complex resource recording system, represents an attractive domain for researchers who want to accommodate its role to the development of human society.

Starting with the “Declaration Concerning the Cadastre” in 1994 and the Bogor, Indonesia Declaration in 1996 up to the “First EU Cadastre Congress” in Spain (2002), the unanimous trend and the conclusions of all these meetings, all emphasize the importance and the necessity of a modern cadastre within every country's sustainable development and environmental protection activities.

In this context, a cybernetic approach to cadastre is not only necessary, but also possible if we think about the very complexity of the MAN - NATURE system.

The cadastre turns out to be in our days “the mirror of human activity in relation to the environment”.

The Cadastre represents “the interface between human activity and the environment”.

From a cybernetic point of view, the cadastre represents the feed back that regulates the decisional process of all human activity by means of which sustainable development is being achieved with an eye on written and unwritten laws of environmental protection.

Cadastrul – o Abordare Cibernetică pentru Sec. XXI - a Dezvoltării Durabile și Protecției Mediului.

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Cuvinte cheie: cadastru, cibernetică, dezvoltare durabilă, protecția mediului.

REZUMAT

Preocupările lumii contemporane în domeniul optimizării folosirii resurselor naturale și artificiale, în procesul amplu al dezvoltării durabile și protecției mediului înconjurator, se manifestă tot mai intens prin multitudinea întâlnirilor organizate sub egida ONU, în care rolul de bază revine diverselor organisme internaționale specializate.

În acest cadru de preocupări cadastrul, ca sistem complex de evidență a resurselor, constituie un domeniu deosebit de atractiv pentru cercetători, în vederea adaptării rolului sau la dezvoltarea societății umane.

Începând cu “Declarația cu privire la Cadastru” din 1994 și “Declarația de la Bogor – Indonezia, din 1996, până la “Primul Congres de Cadastru al Uniunii Europene” din Spania, 2002, tendința manifestată unanim și concluziile tuturor întâlnirilor și manifestărilor internaționale de specialitate, evidențiază importanța și necesitatea cadastrului modern în procesul dezvoltării durabile și protecției mediului în fiecare țară.

În acest context, o abordare cibernetică a cadastrului este necesară și posibilă având în vedere complexitatea sistemului OM – NATURA.

Cadastrul a devenit în zilele noastre “Oglinda activității umane în mediul înconjurator”.

Cadastrul constituie “Interfața dintre activitatea umană și mediul înconjurator”.

Din punct de vedere cibernetic, cadastrul reprezintă feed-backul care reglează procesul decizional de activitate umană, prin care se asigură dezvoltarea durabilă, cu respectarea tuturor legilor scrise și nescrise ale protecției mediului înconjurator.

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1. THE CADASTRE AND LASTING DEVELOPMENT

The land - as the main resource of food and its rational utilization has become today the basic problem of human life itself.

Everywhere on the globe are administrative measures taken in the context of increasing of the difference between the demand supply of agricultural and food products determined by the demographic element on the one hand, the arable land resource relatively limited, on the other. The globalization phenomenon of human activity, interdependence of political, demographic, ecological etc., factors have imposed a new tackling in the careful management of the land, in accordance with the concept of durable development and respecting of environment norms.

The achievement of these wishes is possible as part of a complex system of technical, economical and juridical accounts of all resources but above all, of landed fund, for on this base the soil could be rationally used and managed in order to provide production of agricultural goods and the territory on the whole could be systematized, appropriated and managed corresponding to the necessity of the human society.

According to these demands, the role of the cadastre has become decisive in human activity of using environment resources.

The cadastre – as a complex and dynamical system of technical, economical and juridical accounts of all resources, represents the basis of administration of all real goods (earth, waters, forests, buildings etc) without which we cannot talk about durable development and environment protection.

In the present age the cadastre has transformed itself in an interdisciplinary field of vital importance for durable economical and social development, for sensible, rational utilization of all resources and for protection of environment.

The cadastre has become the mirror of human activity in its surroundings as reflected in. The cadastre is the interface between the human society that plans and works out its action over the resources (soil, subsoil, water, air, vegetation etc) and availability of the environment.

The informational shaped cadastre represents the basic element for durable development of human collectivities.

The cadastre is the feedback of human actions in the environment.

2. THE CADASTRE AND THE ENVIRONMENT PROTECTION.

There is a connection of mutual causality between the cadastre and environment protection, through which we can analyze at any moment the available funds or resources, their condition in time, the way they are used, respecting the demands imposed by the process of durable development, as well as the way the written and unwritten laws of environment protection are observed.

The cadastre – this mirror of human activity in its environment – has become these days a colossal screen on which humanity works according to the statement principles and recommendations of the first “World Conference of the United Nations” in Stockholm 1972, concerning resources utilization, protection of the environment that has to be protected: “Man – the statement says – is at the same time, the creation and the creator of his environment, that provides his physical existence and offers him the possibility of intellectual moral, social and spiritual development. In the long and laborious evolution of mankind on the Earth the moment has come when, because of the ever more rapid progress of science and technique, man has got the possibility to transform the environment in various ways and in a unprecedented proportion. The two elements of the environment, the natural element and the one created by man himself, are essential to him and to his complete utilization of his fundamental rights, inclusively the right of life”.

The principles adopted by the Conference say, among other things: “The natural resources of the globe, inclusively air, water, earth, flora and fauna and especially representative samples of the natural ecosystems must be protected in the interest of present and future generations through a careful planning or management, depending on the necessities”, “the capacity of essential resources production of the globe, that can be refreshed must be protected and re-established or improved everywhere it is possible.”, and “the resources of the globe that cannot be refreshed must be exploited so that there couldn’t exist the risk of their exhaustion and advantages obtained from their utilization to be shared to the whole world.”

We have mentioned all these things to show their present interest and especially to emphasize the role and the importance of the cadastre on a planetary level, to know at any moment the state and evolution of the environment resources.

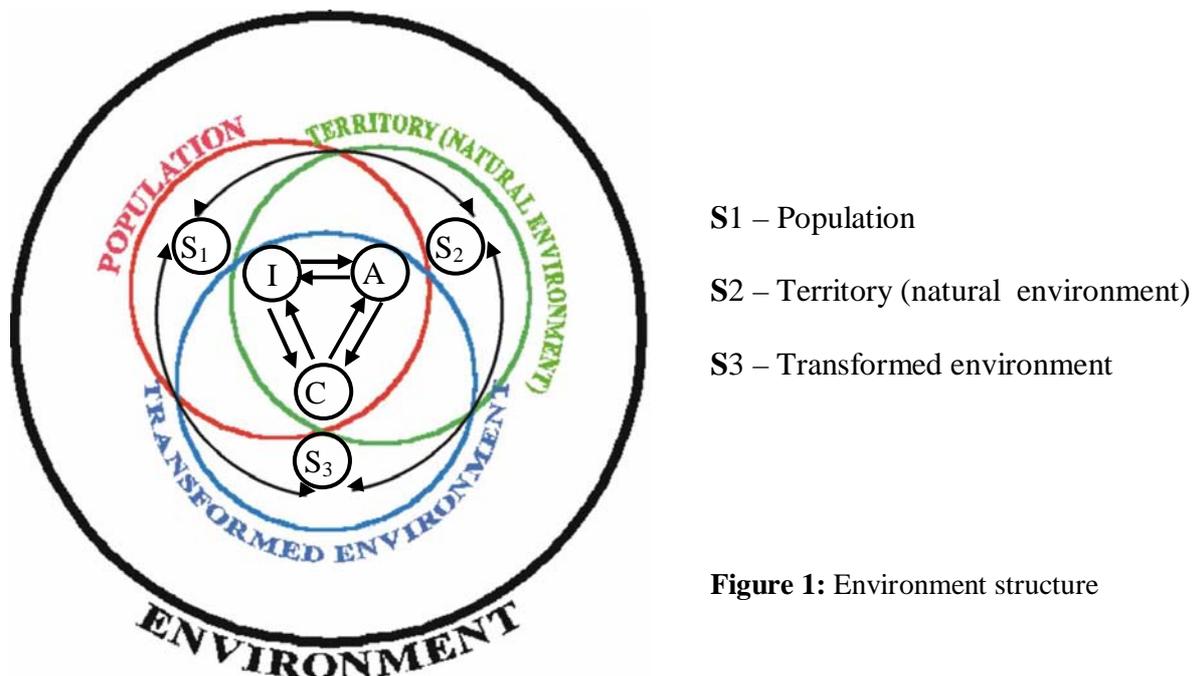
There is a necessity not only for extension of the cadastre on the level of every thing but a new approach, too, a new way of considering this activity department that has become very dynamic and complex.

3. ENVIRONMENT IN SYSTEM CONCEPTION

MAN- rational human being, he lives and provides his living using natural resources of this planet – of its environment- as part of human society which he had created.

The evolution of human society on Terra, different in time and space, the demands imposed by providing of food and housing conditions etc. determined the appearance of a complex building ensemble, which represents the so – called artificial resources.

We can represent the environment of human society using a simplified hypothesis. It includes three elements (Figure 1).



S1 – Population

S2 – Territory (natural environment)

S3 – Transformed environment

Figure 1: Environment structure

The ensemble of the three elements (S_1, S_2, S_3), that is the ambient surroundings of the society is in natural interdependence in the space determined by their intersection (crossing). At the same time, the elements are in natural relations two by two, in the spaces established by the respective crossings. Through this scheme, we emphasize the cybernetic circuit determined by human action upon the territory, transforming it for the benefit of man.

The human activity performed in society upon the territory and materialized in the transformed environment come true in its multiple and various branches (forms): industry (I), agriculture (A), buildings (C) etc. In succession, each of these forms (branches), acts in the medium determined by a concourse of mutual relations of a cybernetic nature. So the change of a form stimulates the changing of others, in a chain of actions and interactions. These changes are taking place within some limits, which can maintain natural equilibrium, but also can gradually create special lack of poise in the relation between man – nature.

The maintaining of this equilibrium is, in our opinion, the main problem of humanity. It depends on the most favorable joining of the three elements for determination of the most efficient forms of human activity.

For this purpose, we think that the maximization of human activity, concerning the territory, is very complex, being determined by the different nature of three elements.

S₁ - population is the dynamic element with an increasing evolution and decisive role in transforming the environment.

S₂ - the territory (natural environment), which includes all natural resources, is a space-limited element.

S₃ - transformed environment, which includes the man-changed environment is a dynamic element but dependent on the natural environment, so limited in time and space.

It results, therefore, that the well-balanced, harmonious economical-social development, concerning the territory, depends on the way the society finds suitable ways and methods for the most efficient joining of the three elements to materialize the human activity under its different forms.

This involves, as an objective necessity of the society, an organized co-ordination of multiple interests that interface on the same territory for the most rational utilization of the resources. The Society is practicing this function through a concrete way of utilization its environment which at our country level, ministry or place, reflects itself through the manner the producing resources are placed and the territory is disposed and organized on the whole.

The contemporary civilization, once with the increasing of the population, makes possible and necessary an intense territorial mobility, creates new models and manners of social life, and creates dense urban crowds on small spaces. The necessity of supplying big urban crowds with agricultural products has got implications over placement shaping and specialization of zone agricultural output, even influences the utilization and the best arrangement of the territory. Of course, the implications are more numerous. We have enumerated only few to emphasize the “regulator” role of human society of the whole territorial system, in order to maintain the environment equilibrium.

The adjustment function exerts itself through a continuous modification of the territorial structures within some “models” and providing the work of the “system” without “disturbances”.

Being familiar, within this “system”, with the different connections between the phenomena and the processes taking place in the territory, the direction and their action tendencies, the complexity and interdependence of the different sphere and field of economical and social life, the dynamics of changes taking place in the territory, requires “information”.

This information can only be obtained through the cadastre. The great amount of “information” required for assuming the “decisions”, the increasing number of unknown elements etc., calls for utilization of modern means and methods of calculation and of course, of required experts for this activity.

The use of cybernetics as a modern method of research and coordination is imposed as an objective necessity in these days, in all the fields of human activity where there are similarities with this science. With this object, the cadastre – as a science and as a part of economical, social, technical etc. activity presents, as we have shown, through the mentioned concepts, the main cybernetic categories: “ the system”, “the model”, “the information”, “the order”.

4. CADASTRE AND ENVIRONMENT – CYBERNETIC SYSTEM

Roughly speaking, the cadastre and the environment, whatever the purpose is, can be expressed through the known block cybernetic scheme as in Figure 2.

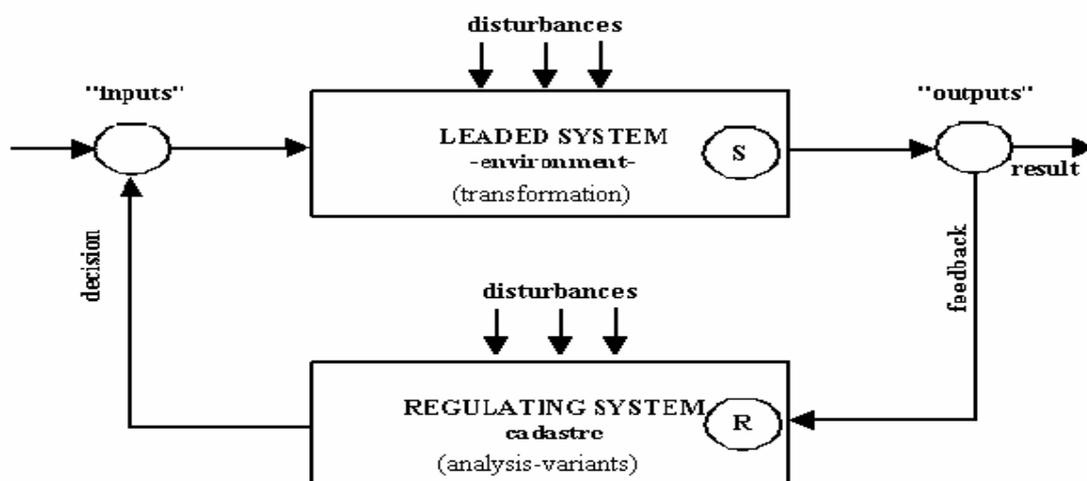


Figure 2. Block cybernetic scheme of the cadastre and environment

From a cybernetic point of view, this scheme represents a leading and organizing system (S+R), which as we know, consists of lead system (S) and regulating system(R).

Human action, directed as “inputs” and determined by a certain “social order (command)” is materializing within a certain transformation as “outputs”. The result is compared with the “rate” given by the social order (command) within the control action through the “feedback”, by the leading system (regulator) and after a process of analysis upon a few variants, a new command is elaborated as a “decision” for a new action.

The new action is dependent on lots of elements that can interfere upon the two systems as “disturbances”.

Maintaining the permanent equilibrium between entrances and exits, through the structural transformation required in the two systems, as well as through “elimination” or “compensation” of disturbances, determines general “stability” of the leading and organizing system (S+R).

Therefore, the stability of the system depends on mutual interactions between its specific “elements”: entrances, structure transformations and exits. For the cadastre and environment, this means that – considering the final social command (norm) as “outputs” and “inputs” – it is necessary to determinate that territorial structure which can assure the stability of whole system at a specific moment. Or, generally speaking, entrance elements and the final norm have got a dynamic nature, it results that the territorial structure is gradually transforming itself, too, in other words it passes from an inferior state to a superior one.

It is obvious that any transformation in time and space in one of the element requires the transformation of others.

5. THE CADASTRE – PRESENT AND FUTURE

The interdependence between the evidence of resources and their rational utilization in the context of durable development at global level calls for suitable measures and obligations from all the countries of the planet.

The globalization of human activity phenomenon determines a new behavior and a new attitude concerning the way the resources are used and managed.

The phenomenon causes the logical and natural question: is there in every country a technical, economical and juridical (legal) evidence of all fixed goods (land and buildings), and is the cadastre of the country realized?

The answer to this question is determined in the correlation between the evidence, utilization and management of the resources on one hand, and durable economical and social development and environment protection on the other.

The uncontrolled use of the environment’s resources in many countries of the world, the lamentable position of the environment’s components like soil, waters, forests, force the actual human society to complete “the cybernetic system of cadastre” in the countries where is not made to break environment’s degradation, to make a new human society, balanced in relation between HUMAN BEEN and NATURE.

In the 21st Century, cadastre can and must become the feedback of human actions in environment, through a new approach and a new way of thinking cybernetic ally.

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