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SPATIAL ORGANIZATION OF NATURE CONSERVATION AND SOCIOECONOMIC DEVELOPMENT IN LANDSCAPE ADJUSTMENT OF SPATIAL ORGANIZATION DEVELOPMENT (SONCOSD IN LASOD)

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SUMMARY

Environmental problems are a challenge for geography work out a synthesis of physical and socioeconomic geography in wider context with ecology, economy, sociology, etc. Spatial attributes of man/land interaction are relevant for environmental management, socioeconomic development and nature conservation. The concept of 'integrated landscape research' as landscape synthesis means functional integration of knowledge on natural processes and forms: landforms, rocks and regolith, climate, hydrocycle, soil cover and biocenoses, socioeconomic ones: settlement, population, production, movement, distribution in spatial organization: location (allocation, spatial diffusion of innovations, decisioning, perception and planning, management) information systems, adjustment and organizational development. Linked maintainance of natural invariants and progressive socioeconomic development are in the focus of our synthesis on theoretical and applied levels. Empirical geographic inquiry of processes space-temporal attributes is bringing data on real world of landscape sphere. The explanation of empirical investigation on theoretical level is connected with interpretation on applied level offering practical application of SONCOSD and LASOD.

INTRODUCTION

Beyond the physiography, landscapelogy, integrated landscape research, landscape management, geoceology more realistic trend of landscape adjustment is applied in environmental and socioeconomic management. It is respecting such disciplines as geography, ecology, economy, sociology, etc., the activities of planners, state and local authorities, landscape users. Landscape as a heritage with accumulated labour of former generations is studied in cross-time sections stressing the future of landscape. Therefore three rows of users, decison-makers and researchers in several columns of past, present and future are recognized in proposed landscape adjustment concept.

Landscape adjustment is a field of cooperation and competition, too, and it is a reason for not only analytical studies, but for a synthesis. The principles of bioecology, human ecology and landscape ecology supported by social and environmnetal studies in a certain socio-economic formation with the leading role of social relations create the framework of landscape adjustment objectives.

1. Users perception of landscape

The topic of perception is not appraised duly in Czechoslovak geography, the paper of Paulov and Ira is an exception, in despite of many works abroad showing its importance in the environmental management. The geographical aspect of perception and mental maps of environment are dealt with in the study of the author from 1979, in this volume is a paper on this topic.

We understand perception through the process of man's use, practical activity in the environment that transforms it. It is not only image and other psychic phenomena, but more complex man's activity including practice, human needs, objectives, beliefs, evaluation, image (response and data gathering) information processing, goals seeking in the interaction man/environment. It enables image of the space, spatial activity simulation serving to decision-making processes in adjustment or management in the framework of certain spatial organization.

It is not possible to forget that any interferences with environment are projected preceptionally into people's lives, work, habitation, leisure and they can motivate, accelerate but also retard social development.

Landscape is a part of human environment and biocenoses environment, too. Therefore landscape environment is a field for complex study — environmental studies, or sciences — intergrating various disciplines including inter- or multi-disciplinary approaches of landscape ecology, human eclogy, geoecology as intersection or unity of geography, ecology, sociology, etc. Landscape environment is a place where we live, work and relax. We perceive it, evaluate, use, transform. But how?

2. Landscape functions shared with decision-makers

Decision-makers look upon landscape as a source for reaching particular social aims, satisfying the needs in the framework of socioeconomic management that is a method for guidance of social development. Decisive processes that will be spoken of later on must be based on relevant information. Decision -makers, in contradiction to users, question wider context of landscape functions, operate with long-term prognoses horizon, anticipate societal development, solve land use in wider societal, economic, technical, political, international, scientific, ethical and aesthetical as well as psycho-social connections, relationshops. They also have means to influence a scale of people's needs, to adjust economic, social and other mechanisms available to manage landscape functions, the way of landscape use, transformation.

3. Physical landscape research

We use the tem "physical" in the sense of ancient Greek word "physis" — nature, including abiotic and biotic components, not strictly limited with "physics".

It is a field of many specialists, including physical geographers. Methodology of integrated physical geographical research of landscape was in Czechoslovakia inquired to the most complex extent by J. Drdoš (1972) who defines it as integrated landscape research. In our research (A. Hynek, 1981) it is understood as the study of synergetic links among natural landscape components on site/topic

level identifying its elementary spatial units, and the study of synchoric connections between site/topic units on higher hierarchy level: scalar, vector, gradient, mosaic elementary spatial choric units connotated as topochores (A. Hynek, 1978). The synoptic approach has a character of data gathering in cross time section portraying natural processes, structures, systems, dynamics and forms, in marginal case it means monitoring, stationary research.

We try to recognize and identify not only spatial units borders but also matter/energy flows, transfer mechanisms, natural invariants, their evolution and dynamic phases, impact of man's activity in the form of anthropogenetic modifications of physical processes and structures.

The analysis is based on synthetic view on natural objects described as systems and structures expressed in models with variables functionally integrated on data vectors. The sources of information can be found in former research, synoptic observation and measuring, models construction, computer data processing, explanation and interpretation.

4. Landscape socio-economic organization research

It consists in the inquiry of anthropo-functional landscape use: processes, forms as responses, productivity, transport, settlement as human activities influencing natural processes and/or creating artificial environment. We study location/allocation in landscape at points, lines and surfaces which are the forms, attributes of socioeconomic activity, its spatial organization, the way of natural and man-power use. These processes and forms reflect an interaction of physical and human ones, man made landscapes are thus formed.

The product of landscape socioeconomic organization is often denoted as cultural landscape. Our concept of landscape is including natural and human components, processes, forms in their functional integration with man's leading role: social development laws are higher than natural and therefore they have decisive position.

In this phase of research the conflicts, risks and hazards in relation to socioeconomic organization are being inquired, searching for alternatives or adjustment of society/nature interaction harmonization.

5. Anthropofunctional landscape structure

It is including functional use of areas, their natural resources, more or less corresponding with natural landscape spatial units. But it is not sufficient enough to follow only contemporary state of landscape. A weak side of formerly formulated integrated landscape research is in underestimation of time scale, firstly: a specific time of natural components is quite different and relaxation after intervention is not the same one, synchronized. secondly: landscape structure is not formed only by contemporary processes but it includes the responses of former processes; a positivist aggregation of data organized only spatially without time scale is false in explanation and interpretation. Mainly ecotones, subsettlement and highly diverse ecotones and land use segments have the most outstanding changes in functional landscape structure.

Czechoslovak landscapes went through and still are going through many changes in the framework of socioeconomic development having the nature of

spatial waves of diffusion innovations. In old cultural regions, e.g. South Moravia we can specificate at least 8 waves of spatial diffusion innovations, in mountain landscapes they fall to 3 ones. Anthropofunctional landscape structure has been quite different during the innovations waves with various types of land use. We can follow not only progressive development but regressive waves of natural landscape processes rejuvenation, multiple changes of some landscape segments functions and a number of responses linked with the past processes. The moving force of mentioned changes is a socioeconomic development based on certain ownership, social relationships, mode of production, division of labour and distribution.

Having reached this phase, users, scientists, and decision-makers should come to a certain landscape plan how to organize landscape also in spatial context, to a certain form of land use, anthropofunctional landscape structure with respect to nature conservation as well socioeconomic development.

6. Nature conservation

Landscape use is not possible without implemented functional and not only pro claimed conservation of nature. Within choric spatial landscape units above topochores it is necessary to consider anthropofunctional use of single landscape segment in scope of natural spatial landscape units, total landscape spatial organization. We have to propose which landscape segments are to be conserved in certain degree of protection, what will be their contribution to other functional segments of landscape. Contemporarily the share of conserved landscape segments with varied adjustment amounting to 20—30 % is recommended in anthropofunctional landscapes, concerning the area of more than 100,000 sq. km.

It is sophisticated careful use of natural resources, maintaining natural resources invariants, the genetic diversity, spatial landscape diversity, stability and resiliency, ensuring non-degrading evolution, that may be called the nature conservation. It means that renewable natural resources are really being renewed, restored, non-renewable ones are recycled or rationally exploited, the waste is used as new resource, raw material, and it is the way for anthropofunctional landscape adjustment, management, harmonization. This kind of natural resources use acknowledges even their usable value. It maintains, not devaluates the labour accumulated in landscape by a number of generations, looks on landscape also as our ancestors "heritage", bearing in mind scientific and technological knowledge concerning natural resources use.

Absolutely not the bucolic-arcadian sentimental and on the other hand ultra-radical-artificial or defeatistic approaches to landscape organization development are the matter but acceptance of sophisticated strategy of decision-making anticipating future development based on historical optimism.

7. Social objectives

Laying them out is the projection of certain societal needs that are moving power of social development. Science and technology in last years' dynamic progress provided many people with the feeling of euphoria having its source at the possibility to satisfy very immodest demands by the very immense abusing the nature.

As having mentioned above, however, modern technology serving for private profit or used without being harmonized with nature produces a tremendous amount of waste, reduces diversity of organisms in landscape, affects natural processes untill lately with conserved non-degrading development.

In fact it is not always a fault of technology, but the result of certain social relations which are decisive in landscape as well as environmental management, and for rational, optimal spatial landscape organization. Where not societal prosperity but private or group acquisition is at the aim, there not only the society but even the nature are impoverished.

Therefore in the socialist society socioeconomic management is being developed which is engaged among others in social needs regulation, prudent management of societal development including also a certain way of landscape spatial organization. Natural landscape capability: matter, energy and information are inexhaustible, it is true, but their use depends first of all on the stage of social development.

8. Information system

Creating landscape spatial organization in the process of decision-making and implementation is impossible without functional information system on landscape. Formation of this system is now connected with computers which serve after data gathering for their processing into information in the graphic form and their application in decision-making. Functional information system on landscape is closed to our strategy and in no case is identical with gigantic projects "taking all" data. Our information system is built of partial modules by gradual interactive compatible integration subordinated to certain strategy.

The question of quantification linked with modelling at any rate cannot be the right solution in the information system as the only way of neither explanation nor interpretation. Formal models testing has its limits if it is not linked with social relevance, praxis. Scales choice must respect a specific substance of the inquired processes and forms, social goals. Numeric expression of variables in models is fit not only formally, but in the case of landscape must unify natural and societal processes in causal sense, not mechanistic one.

Criteria of an effective information system can be even in its matter-of-fact accuracy, flexibility, innovations development, compatibility and societal value. From the geographic point of view a spatial attribute of data/information is very important due to be also an spatial operational unit in landscape spatial organization. There are some alternatives of territorial units: regular geometrical network, irregular one and/or real spatial units delimited in natural (societal processes) forms investigation.

9. Decisive criteria

They are of the same importance as the process of decision making, landscape organization development itself. In the ideal case users, scientists and decision-makers adhere to the same criteria. But state of this kind is an exception and therefore the decision-makers must first of all give responsible argumentation for their criteria, take into account also both the users' and the scientists' ones. Maybe it is our spatial resortism prevailing in decision-making within landscape

organization management, it seems to be great problem. And it is the very cause of the one-sided decisions non-respecting entirety, context of the problem with society/nature interactions as well as vagueness of further development — landscape organization prognosis. We can recognize two main criteria in spatial organization of landscape: nature conservation and socioeconomic development as they are stressed in World Conservation Strategy. The particular criteria sets are given in detail in other items with commentary, see points 11 to 14.

10. Alternatives of landscape organization

Variety of landscape evaluation by users, scientists and decision-makers appears in various alternative concepts, constructs as well as certain propositions of further landscape organization development. Enumeration of possible alternatives must be done by scientists in cooperation with the users accepting general trend of socioeconomic management. They have to prepare argumentation respecting users who live in certain landscape, scientific progress and the societal objectives within socioeconomic development management. It is not an easy task for experts because in rare case the alternatives are allied.

Therefore in the socialist society socioeconomic management is being developed which is engaged among others in societal needs regulation, prudent management of societal development including landscape planning within territorial planning linking resorts and areal management.

Alternatives must accent first of all solving societal problems, historical evolution, revolutional changes, contemporary state as well as prediction of further societal development, all-society context, international one, too. We are convinced that defects are not in alternatives generation but rather in argumentation on dialogue level. Communication, contacts and management cannot be understimated even in landscape spatial organization development.

11. The benefit/cost ratio

Although this is an economical term, its range is wider. It is known fairly well that energy cost exerted by man on food production exceed many times, in highly developed countries about ten times, value of food energy. At the same time energy acquired from non-renewable natural resources is mostly lost. Lowering the contribution of man-power "live labour" in production the standard of living has increased by intesive use of natural resources.

The benefit/cost ratio is not stable, it varies in dependence on increasing price of energy, labour, materials, worthy value and information in the framework of socioeconomic development. Thus a number of landscape organization plans based on the situation of the 70's projected by linear extrapolation into the 80's became a contemporary anachronism, they simply failed. That is why to stress prognosis, prediction process within landscape organization planning.

The benefit/cost ratio in socialist society is not a question of private profit, or groups one, but more complex problem emphasizing all-society ratio. Simple financial calculation without broader context is false in spite of very difficult recognition pay-off matrix.

12. Socioeconomic management strategy

Great increase of the number of works on prognoses proves the necessity of due appraising socioeconomic management strategy. Not a toll to fashion is at stake but a societally motivated demand made on science, needed for further social development. Problems in the processes of reproduction and regeneration of productive forces, changes in value orientation of social groups or — in more general bearing — an urgent need of solving mutually linked global, regional and local problems of mankind lead to revaluation of absolete approaches landscape organization.

Middle- and long-term planning is a challenge for finding predictions, anticipation of changing situational and future development with hierarchy structure of goals, potentials, space on local, national and international levels. We know antecedents of our strategy, moving in white noise of consequents, nevertheless even a strategy must develop as a feed-back of implemented ones.

13. Natural invariants maintainance

In spite of enthusiasm over so called artificial environment which, by the way, is being maintained by transformed natural processes, we are entirely dependent on the nature of the Earth's landscape sphere occuring as an integrative intersection of component spheres: atmosphere, hydro-, litho- and landforms, pedo- and biocenoses, strongly influenced by man/society. We use natural resources of landscape sphere and contemporary level of exploitation is a reason for nature conservation from now on.

We understand natural invariant by continuously renewing and non-degrading of matter/energy transformation in natural complexes, their structure as an operator transferring inputs into outputs keeping, maintaining its stability, dynamic ballance which can be compared with a candle-flame. An invariant maintains a natural complex, set of natural components linked into the whole on certain hierarchy level, as an open system with free matter/energy output. If natural invariants are destroyed then either degradation of natural processes occurs or their productivity, free matter/energy are ensured at the price of high expenses of production, degradation of other mostly unrenewable natural resources invariants.

14. Landscape organization synthesis

We have come up to the point where all the things at stake are known. The synthesis is understood here by landscape organization construction, creating a functioning mechanism which ensures satisfying social demands, societal needs as well as the objective of nature conservation.

In the foregoing discourse the situation has been analyzed on the level needed for the responsible decisioning in context of nature conservation and socioeconomic development. If at the beginning of the analysis we face the whole picture of landscape being more deeply inquired during the analysis, then the synthesis in understanding the entirety of a higher level with using analytical information, in understanding structures and processes aiming at their management, pursuing an objective of their management, controlling mechanisms with respect to natural

and social laws. In the synthesis the process of management is followed that regulates their function in keeping with societal demands.

A synthesis in holistic sense applied on landscape spatial organization means recognition and identificiation wholes, complexes, component connections — structures, but synthesis may be also understood as a system construction, proposition of man/land interactions or nature conservation/socioeconomic development process of landscape adjustment.

A synthesis level is reached in team-work cooperation of specialists led by specialist with synthetic field of inquiry.

15. The choice of landscape organization alternative

It is the choice of the optimal alternative from the number of submitted ones, a practical position of landscape organization synthesis consists in. We presume decision-makers will include the best suggestions among alternatives and make the choice on the basis of the criterion of social relevance. One of the basic demands of synthesis is applying the best scientific knowledge on up-to-date level of scientific progress. Also the users cannot be omitted who work, live and relax in the landscape.

At all alternatives the consequences of introducing them, their impact on natural invariants and societal processes must be known. Therefore the prediction, future development anticipation are explicitly included. Another relevant objective is the reality of alternatives, their implementation, acceptable cost. Discussion on term 'optimal' should be developed in the context of synthesis nature conservation and socioeconomic development.

16. Decision-making process

There are some formalized procedures of decision-making that can be used on the basis of causal analysis and synthesis even in our case. The proper technique of decisioning must fulfil wider context of societal problems solving and must not lead to their running to a head. This is a very important demand, not very often asserted in solving society/nature interaction in landscape. One cannot look upon landscape as a natural phenomenon when using natural resources. It is namely in process becoming a societal object. Landscape qualities as value bearers evoke a particular way of adoption, they acquire human meaning, become a part of societal life, influencing other human attitudes and behaviour.

Decision-making as a constituent of management follows a certain aim. Partly it looks after the ways of reaching this aim, partly clearly delimitates the final state and its consequences. From these points of view the alternatives are comparable then, in keeping with certain criteria, and that enables to choose that one which is adopted afterwards.

17. Optimisation of society/nature interaction

In spite of many reserves emphasizing the until now lasting vagueness of the term 'optimisation' the demand of harmonization the man/society/nature interactions, their synthesis must not be omitted. On the one hand there is no

way back to mentioned bucolic-arcadian landscape embellished in pastoral scenes, likewise artificiality or nature destruction are not alternatives.

It is possible to achieve improved landscape by reducing the waste carried out to the landscape, by re-cycling unrenewable natural resources, by better use of the renewable ones, applying new technologies, by minimalization of costs. At the same time these are the ways how to optimize the society/nature interaction. One of the first steps to ecological situation improvement must be among others cutting the nature degradation, reversing the regressive trend which may have immense negative consequences for a man and society. The hazard of growing toxicity within the landscape, literally strokes on its nature by numerous scars of man's impact, genetic fund pauperization, etc., are examples of non-respecting the demand of harmonization of the above mentioned interaction. The construct of noosphere, developed by Le Roy and Vernadskij, on the other hand is an ideal, theoretical basis for society/nature interaction on up-to-date level of nature conservation/socioeconomic development.

18. Anthropofunctional landscape spatial pattern

Regardless of the anthropofunctional type of landscape: urban, rural, industrial, recreational, conserved, suburban, forested, polyfunctional it must inevitably have polyfunctional segments provided people live there. As towns residentials should find there good living/housing, work and recreation, the same holds true of rural, agricultural productive landscape. Monofunctional landscapes are rather exceptions in highly developed countries. Similarly as natural landscape is a pattern of various elementary spatial units in which processes complexity becomes evident, functional landscape should have not only a certain socioeconomic diversity but even the natural one.

Functional spatial landscape pattern is the theme solving of which is dealt with also in geography. It emphasizes among others the study of socioeconomically organized landscape space by human activity. The choric context, in addition to site/place one, has been known in geography since antiquity, but has not fully worked out so far. And yet it is the geography that proceeds from spatial differentiation analysis to spatial organization analysis and synthesis. On the empirical level it follows spatial pattern of nodes, lines, surfaces, networks, location/allocation, interactions, contacts in time-scale development as the attributes of natural and socioeconomic processes answering not only the question: how things are? but another: now things should be?

19. Landscape organization adjustment

We understand adjustment by the process of real territorial landscape management when implementing the chosen alternative of landscape spatial organization. Decision-makers role does not end by choosing the solution, in the same way it does not mean stopping the research by specialists, not speaking of the users. Their contacts must continue, though in real life it is an exception. Unfortunately it is still a customary practice, maybe standard procedure that the scientists take up other tasks in another landscape territory, partly having no feed-back

information on their inquiry application, partly some operational interventions take place and seldom the chosen alternative is implemented in the same way as it was proposed.

It does not matter as long as there have been imperfections that are being removed, but it does if a good alternative comes at naught. This is a considerable weak point of landscape organization development although organizational development is relevant thing. Research activity without monitoring the course and consequences of innovations introduction loses best-fit criterion of societal praxis. Using the term 'adjustment' is not regarded as a fashion tax but respecting the limits of practice. Management can be better spoken of in the case of physics, chemistry, etc., while in case of societal processes management is of less strict and deterministic character.

Practically it means to appraise duly the role of resorts and national/district/local authorities in landscape organization.

20. Landscape organization development

In dynamically changing conditions and development when new situations, often different from the preceding ones, arise, interferences in alternative implementation of landscape organization are not quite rare. Organizational development is not only a part of certain strategy, but situational approach is still applied in the framework of alternative or strategy. We permanently compare the proposed objectives and real on-line ones, the wider context of decision-making, socioeconomic development, too. Landscape represents a multiform segment of the objective reality with society/nature interaction with growing demand on natural resources, both extensively and intensively. This power has even its negative consequences in the possibility of nature destruction. Very often a number of man's needs have not any objective basis, their fulfilment is not necessary at all. Therefore we have to pay attention not only to natural resources seeking and exploitation but also to needs control.

21. Information system retrieval

Nor the landscape organization adjustment is possible without functioning information system. Besides the above mentioned features of that kind of system we emphasize here the necessity of following adjustment consequences, natural components behaviour, their interactive/integrative mechanisms, monitoring the state of landscape, key-areas investigation under stationary or pilot study, a sequence of air or remote sensing. The socioeconomic research of the society/nature interaction, following perception or new situations are also needed.

We store older information to find out trends relevant for prognosis statement. Of course we consider requisite variety information, not data of any kind. The two usual types of decisioning either with minimum of information and/or on immense extent of data show very high entropy, not negentropy – information. Changing landscape is a cause of information system retrieval together with organizational development.

22. Landscape organization evaluation

The so-called quantitative revolution in geography, in spite of indisputable useful investment, has dimmed the deeper sense of social relevance of geography. For the sake of recognizing the basic landscape processes, importance of landscape for man/society, a specific form of reality reflection is necessary. It attaches to recognition and practice. It becomes evident by distinguishing the meaning, by preference or indifference, and even by opposition when solving the problems.

Man assesses landscape reality by accepting certain values and tendencies in man/land interactions through perception, activities, processes/responses, practical purpose of landscape. Therefore evaluation is an important part of landscape spatial organization.

23. Conclusion as innovation

Landscape has not only its natural processes development but it is organized by man into functional one. Societal activities cause the landscape changing in spatial diffusion waves of innovations. So the whole information model is not static, but is progressed as a whole, flexible in single points. In landscape those processes become very dynamic being accelerated by man. Especially up-to-date functional landscape structure is going through changes which are quite new, they have not occured before contemporary phase of landscape development.

Natural processes are ever more strongly modified by man/society/nature interaction giving rise to a lot of new mostly problem situations, hazards. Even considering the high degree of scientific progress, the prognosis of the consequences of natural/societal interaction is not on the level good enough for us to know quite exactly in anticipation which changes we shall meet in landscape.

Not only the nature changes, though, but also the people, processes of production, standard of living, value orientation and the relation to nature, besides many other changes. The age of intensive economy is coming in wider context of societal, scientific and technological development. The past natural resources use brought shortage of energy and a number of materials, problems of food production, environmental quality within the man/land interaction development.

Also the socioeconomic spatial landscape organization takes part in these changes, itself being impacted and/or being a factor of changes. The decisive position is occupied by social relations, first of all means of production ownership, the character of the whole socioeconomic formation.

There is a task for geography to offer more real picture of landscape, processes and forms, relevant information for landscape management or adjustment, taking part in societal problems solving, to bring relevant information.

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