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EVOLUTION OF NATURE MANAGEMENT SCIENTIFIC CONCEPT IN RUSSIAN GEOGRAPHY

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Abstract: Nature management is regarded as a process reflecting multiple interrelations in Nature-Human society system. As practical activities it appeared with the beginning of human nature exploitation. But its scientific concept is being developed only nowadays when synthesis of natural and human sciences knowledge became possible. This synthesis reflects the postnonclassical stage of science development in general marked by philosophers. Evolution history of nature management scientific concepts in Russia is presented. It started at the second half of the 20th c. Contributions of economic and physical geography to this process are described. Differences of nature management and geoecology which tasks are often regarded as similar are demonstrated. Geographical nature management absorbs several concepts of geoecology, economic geography, economy, culture studies but must be regarded as an individual branch of science. Examples of geographical nature management outside Russia are given. It develops within the frames of regional analysis— traditional for European and American modern geography. This analysis presents synthesis of geographical, social-economic, geoecological, ethnic-cultural and other knowledge about the studied area and is directed at revealing of nature management administration mechanism.

Key words: nature management, system, concept, evolution.

Introduction

An English philosopher Francis Bacon once gave the following characteristic to different stages of science evolution: at first a scientist reminds an ant which carries everything to his ant-hill. Then comes “The Bee stage” when a scientist receives an opportunity to produce scientific “honey” due to the collected data processing. And at the final — “The Spider stage” theoretical constructions become possible. All these stages may be clearly seen regarding nature management science development in Moscow State University which started in 1987 when a special department was established at the Geographical faculty. The same is true for the development of this new branch of science in Russia in general.

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Nature management regarded as a process reflecting multiple interrelations in Nature-Human society system appeared with the beginning of human economic activities. But its scientific concept is being developed only nowadays when synthesis of natural and human sciences knowledge became possible in investigations of complicated interlinks in Nature- Society-Economy (named also Social-Natural) system. Being a multidisciplinary scientific field in its gist, nature management science has a strong geographical component reflecting temporal-lateral patterns of this process. Nowadays nature management patterns to a great extent form modern geographical world outlook, determine prospects of human civilization development and that of the Biosphere in general. Rational nature management appears to be a necessary precondition of regional sustainable development and movement towards “green economy”.

Nature management: scientific knowledge contribution spectrum

In spite of the increasing interest to nature management problems in economy, sociology, geography, ethnology and other sciences there is yet no joint view on its gist. Russian academician P.Ya.Baklanov marks several approaches to nature management studies: historical, economic, social, technical, geographical, ecological etc.(Baklanov, 2004). He also stresses a special integrative function of geographical approach which enables to attach heterogeneous processes characteristics to a certain territory. At the end of the 20th c. an active work on elaboration of scientific fundamentals of geographical nature management began and continues till now. In the course of this work representatives of social-economic branch of geography based their constructions on already existing concepts of land use studies, territorial-economic complexes, resource cycles theory etc. which were considerably ecologically renewed at the edge of the millennium. In physical-geography which experienced ecological renewal much earlier the basement of the new scientific branch was prepared by geocology. Different basic scientific contribution to the development of geographical nature management ideas caused its extremely broad interpretation in geography in spite the existing understanding of geographical synthesis necessity.

It must be acknowledged that investigation priorities in geographical studies of nature management problems till now belong to geocological studies—environment pollution and monitoring, nature conservation, natural resources potential etc. More than that rational nature management science in fact is often regarded as similar to geocology. For example university curriculum for training of nature management and geocology specialists has almost no differences and sometimes coincide as well as nature management manuals

published recently (Rodzevich, 2003, Rudsky & Sturman, 2007, Emel'yanov, 2011 etc.). The same case is with publications in journals and research programs referred to "nature management". This "mixture" excludes management aspects from nature management science thus establishing its natural science character.

Practically alongside with the development of "geoecological" nature management its economic concept is being formed. First studies of economic mechanisms of environment pollution protection, payments for resources exploitation etc. developed within its frames due to works of T. Hachaturov, M.Lemeshev, K.Gofman, N.Fedorenko & N.Reimers and other. Appearance of ecological economic concept of natural capital in the early 90s and natural rent theory should be marked specially. They integrate economic and geoecological knowledge, thus approaching to geographical concept of nature management. Obvious achievements in the discussed field nevertheless are often accompanied by poor geoecological knowledge of ecological economists. This explains the appearance of "new" terms, for example - natural assimilation potential which is in fact the same as environment ecological capacity, or permissible pollution level which is similar the highest permissible pollutants concentrations and total pollution load which exist in geoecology for a long time. Nevertheless ecological economy made an important contribution to the development of geographical nature management concept. It demonstrated quantitative links between Nature and Human Society subsystems which may be controlled.

A constructive conception of modern stage of science development (named postnonclassical in philosophy) important for elaboration of nature management theory is integration of Man into the whole of the Universe. This stipulates development of certain humanitarian investigations in nature management science. Nature management type depends on economic culture reflecting values, motivation and cultural aspects of economic activities. Human history proves that cycles of social-cultural changes (according to P.Sorokin,1992, O.Spengler,1993, A.Toyenbee 1996 etc.) during which nature management patterns change radically are caused not only by depletion of natural resources but also by collapse of spiritual culture, including spiritual fundamentals of nature management. Modern geographical nature management touches upon humanitarian aspects very seldom (ethnic-cultural aspects of traditional nature management and nature management in cultural geography). But practical needs are very urgent. Market economy approach puts no limits to nature exploitation and ignores traditional ecological knowledge which always have ethic fundamentals.

Finally it is possible to say that geographical nature management absorbs several concepts of geoecology, economic geography, economy, culture studies etc. but must be regarded as a an individual branch of science! Its main task is development of reliable management system mechanisms for nature exploitation harmless to Biosphere.

Evolution history of nature management conceptions

There is no possibility to describe all the details of evolution history of modern scientific conceptions of geographical nature management. We tried to demonstrate main milestones of this process in table 1 (Krasovskaya, 2008).

Table 1. Evolution history of nature management conceptions

Nature management	
Practical activities Exploitation of natural resources and geosystems ecological services	Corresponding leading scientific conception Resources management studies – “Economic-geographical” conception
The same + nature conservation	Resources management and nature conservation studies – “Economic- and physical- geographical” conception
The same + environment monitoring and economic assessment of natural resources and geosystems ecological services and their exploitation	The same + geoecology and ecological economy – “Geoecological and economic “ conception
The same + social-cultural analysis of economic activities	The same + humanitarian studies (social ecology, ethnic-culture landscape studies, landscape aesthetics etc.) – “System analysis” conception
The same + use of moral regulation (restrictions)	Rational nature management – “Noosphere” ² conception.

Nature management system functions

We consider that difficulties of nature management theory elaboration (let us mention that such educational discipline has been already included into specialists training curriculum) are connected with fuzzy notion of its functions in Social-Natural system. Nature management in geography is necessary to regard as a certain social-cultural process of spatially differentiated natural capital exploitation (we named such approach “functional”). This approach is opposite to that which regards nature management as an object - a separately acting economic system (“object” approach) (Krasovskaya, 2008). Nature management regarded as a geographical branch of science studies possible

² After V.I.Vernadsky

heterogeneous regulation mechanisms to optimize interlinks of energy-matter and information fluxes in Social-Natural system in the course of natural capital economic exploitation. Dynamic modeling is actual for such studies. Vector graph of territorial (spatial) functions in Social-Natural system (fig.1) in spite of inevitable simplification enables to differentiate objects and functional links in this system which belong to geoecology, social-economic geography and nature management. “Functional” approach to determining of nature management clearly demonstrates its regulatory role in Social-Natural system. Geographical support of nature management process may help to avoid numerous mistakes in its modern pattern in Russia.

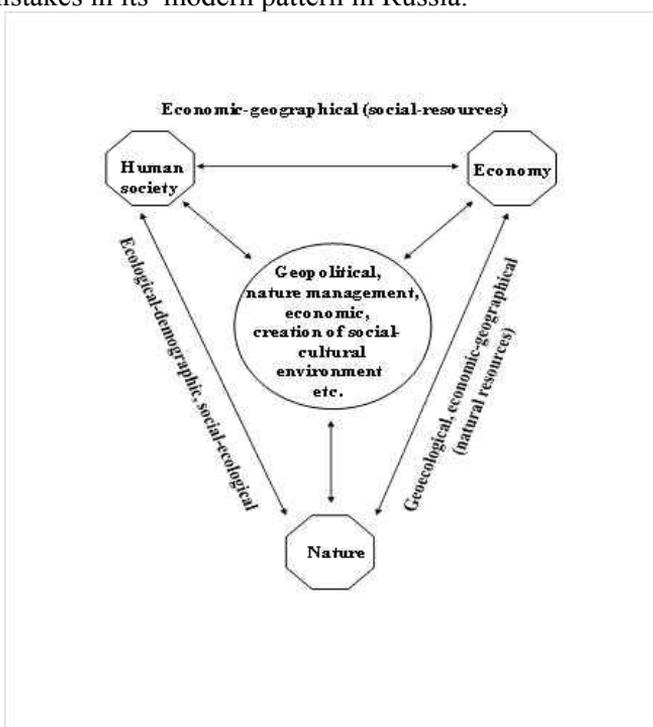


Fig.1. Vector graph of territorial (spatial) functions in Social-Natural system

Nature management science: international experience

Finally let us briefly discuss analogies of geographical nature management outside Russia. They develop within the frames of regional analysis— traditional for European and American geography. This analysis presents synthesis of geographical, social-economic, geoecological, ethnic-cultural and other knowledge about the studied area and is directed at revealing of nature management mechanism. Very often mathematical modeling is used based on

heterogeneous information data base. This enables to test different management scenarios and develop new patterns corresponding to sustainable development criteria. For example, this was done to improve nature management pattern at the territory of a large lake watershed in Murmansk region, Russia (Voinov A., Bromley L., Kirk E., Korchak A., Farley J., Moiseenko T., Krasovskaya T., Makarova Z., Megorsky V., Selin V., Charitonova G., Edson R., 2004, Voinov A., Kirk E., Moiseenko T. Selin V., Makarova Z., Sandimirov S., 2002). Parameters used for modeling are presented at Fig. 2 .

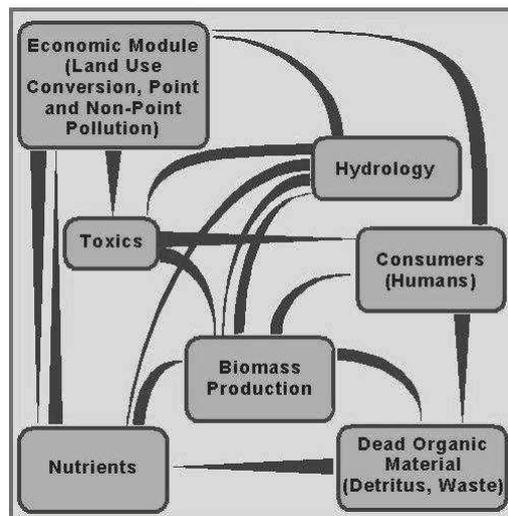


Fig. 2. Major modules involved in the Landscape Modeling Approach

Source :Voinov A. et al., 2004

Adequate data base, including humanitarian data (historical, cultural etc.) characterizing nature management, gives an opportunity to perform landscape planning directed at creation of optimal nature management structure. For example, traditional structure of nature management is being restored now in Altmühltal nature park in Bavaria. It includes combinations of agricultural, forest and recreation territories which create traditional for this region of Germany scenery protected by law [fig.3].



Fig.3. Photo: traditional scenery in Altmühltal nature park (Bavaria)

These activities are possible due to well-developed legislative support. Elaboration of optimal nature management structure in this area includes development of recreation and tourism activities, nature conservation, historical sites preservation alongside with limited agricultural land use. Advanced heterogeneous nature management structure corresponding to sustainable development was elaborated due to combining humanitarian and natural science knowledge.

Conclusion

Difficulties of geographical nature management scientific concept development reflect the inevitable initial stage of any science evolution. Traditionally strong schools of physical and social-economic geography in Russia form its stable fundamentals which need further development for a new scientific field. . Postnonclassical science to which geographical nature management belongs by all means demonstrates efficiency of humanitarian and natural sciences knowledge synthesis. The same is known for a long time from practical activities in nature management. For nature management this knowledge is not strictly geographical in traditional sense accepted in Russia. New trends in Russian geography in this respect are clearly demonstrated by human geography studies in Russia (Mitin, 2012). Promotion of geographical nature management self identification, its theory and methods development will benefit to practical use of the accumulated knowledge for transfer to sustainable

development. It will also help geography to occupy key positions in solving these problems.

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