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## RELATIONSHIPS BETWEEN HUMAN-ENVIRONMENT-SPACE OF PLACE – THE EVOLUTION OF RESEARCH PARADIGMS IN GEOGRAPHY AND THE CHALLENGE OF MODERNITY

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### Abstract

This paper presents the evolution of research paradigms in geography related to the study of relationships between humans, environment and place, and their tenacious role in functional and spatial analyses of the environmental megasystem. The author describes ontological, epistemological as well as axiological dimensions of interdependencies between humans, environment, and place, understood as space in which the integration of nature and culture takes place, influencing, among other things, human behavior and generation of the quality of human living conditions. Surveys conducted among the inhabitants of the environs of Warsaw revealed how different the perception and valuation of environmental issues is depending on space of place, its structure, and function. The author also emphasized the potential of environment as a value, which presently, in connection with the quality of human life, is perceived in the category of supply and demand.

### Key words

relationship • environment • space • place • paradigm • Warsaw Metropolitan Area

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“Man today, especially in the context of a highly developed technical and industrial civilization, has become an explorer of nature on a grand scale, often treating it in a utilitarian way, thus destroying many of its treasures and attractions and polluting the natural environment of earthly existence. However, nature is also given to us to be admired and contemplated, like a great mirror of the world (...).” (John Paul II 1985).

### Introduction

As interdependencies occurring between humans and their living environment were already being discussed in antiquity, they have constituted an important subject of scientific research for a long time. Presently, the human-environment relationship is also of great importance for many scientific fields, which aim

at undertaking and solving the issues connected with the nature of world and human (Lambin 2005; Maik 2006). Geography is undoubtedly one of multiple scientific disciplines, the research scope of which includes the study of the interactional relationship of natural and anthropogenic systems, and which will continue to treat the study of these relationships as its proper and specific research subject. As science develops, together with geography as one of its disciplines, theoretical and methodological progress will also take place and new theoretical models will be elaborated which, through empirical verification, will be adopted as applicable solutions. They will be used for the assessment and/or prediction of the course of natural, as well as anthropogenic, processes and phenomena, and their interactional interdependencies occurring in the megasystem of the geographical environment. The evolution of the scope of research in its objective aspect will also take place, caused by the emergence of new objects and phenomena of both physical as well as socio-economical origin.

The issues connected with the human-environment relationship have thus been, and are now among, the basic questions related to the knowledge of our earthly existence in the ontological, epistemological as well as axiological sense (Degórski 2006). These issues were also of major importance for the development of geographical thought, being since the end of the 19th century, the cognitive foundation accumulating fundamental empirical potential (Maik 2006; Giuliani & Scopelliti 2009). In the attempt to define their scientific discipline, geographers have also referred and refer now to the relationship between humans and the environment. In Poland, Pulinowa (1996), based on the performed analysis of defining geography as a scientific discipline, pointed out that in the last century of the second millennium, the most frequently repeating object of geographical cognition referred to interdependencies between humans and the environment.

Irrespective of the evolution of research paradigms, the nature of place will still be present in geographical studies aiming at understanding the relationships occurring between human

and environment, as it is a crucial attribute of human existence in the geographical environment, which also constitutes an inherent element of cognition. Deep psychological and emotional bonds occur between humans and their homes (Tuan 1977: 45). According to the same author, geographers did not take enough interest in this human commitment to place and its perception, analyzing mainly the abstract, geometrical and subjective notion of space (Tuan 1974: 132). Such a state of affairs is caused by, among other things, a widespread belief among geographers that space constitutes the basic subject of their research and relationships occurring between subsequent spatial components are an inherent mechanism of cognition.

In the search for new research paradigms, or while performing constructive revision of the existing concepts and theories constituting the foundations of geography, it is necessary to adopt the perspective of a human-environment-place relationship. On one hand, it becomes possible to assess dynamics of interactional interdependencies between socio-economic process and natural factors that determine them, or vice versa (anthropogenic impact on the environment), as well as to identify the actions that optimize the functioning of the geographical environment megasystem on different levels of spatial organization. On the other hand, it enables the shaping of the human-place relationship, in both an ontological as well as a noospheric sphere.

The aim of the paper is to determine the role of geography as a scientific discipline in the study of human-environment interaction in the space of place as well as to define the research paradigm enabling the research on these mutual relationships in contemporary ontological and axiological conditions.

### **Geographical research and intersubjective paradigm in the study of space of place**

The specific character of geographical research results from two research approaches connected with the overall analysis of the geographical environment megasystem. The first approach,

according to the theory of Wilson (1998), is based on the consilience of knowledge about the structure and functioning of the geographical environment megasystem through the synthesis of a consistent set of information about subsequent systems and subsystems. The second approach is holistic and according to it, the phenomena create a comprehensive system and reasoning is based on information concerning the entire system and not on the rules governing its components.

In this research context, the megasystem of geographical environment can be defined as a comprehensive hierarchical system consisting of lower order systems (natural environment and socio-economic environment), subject to evolution resulting in the emergence of a new quality comprehensive system (evolution or degradation of the megasystem of the geographical environment). This dualism is characteristic of geography, and it is expressed in the study of the geographical megasystem, including the natural and socio-economic environment systems too, as well as the interactional relationships between them. This constitutes a research approach, which makes it possible to create its overall image and allow for studies on the human-environment relationship. The comprehensive character of geographical studies had been pointed out already when the methodological foundations of modern geography were being formulated. For instance, in the middle of the 19th century, Galton (1855: 107) had written in his work determining the foundations of modern geography: "Geography as a scientific discipline broadens the perception of reality in a peculiar way. It accumulates the dispersed knowledge of other disciplines, assigning to them the meaning they lacked while taking them into account separately". This statement has not become outdated as it still emphasizes the specificity of geographical research in the context of its consiliential and holistic character. Despite the fact that 150 years have passed, its theoretical as well as pragmatic meaning is very clear and thus verifiable. It makes it possible to emphasize the thesis, which is still up

to date, and states that a comprehensive approach towards the functioning of geographical environment megasystem is an inherent characteristic of geographical studies. However, other disciplines refer to the specificity of their subjects and methodologies and study subsequent components of the environment or gather information in the context of the functioning of one of the systems of the geographical environment megasystem, being the natural environment or socio-economic system.

The next characteristic of geographical research, predisposing it to the studies of human-environment relationships, is the application of different scales in spatial analysis (so called multiscaling), enabling the generalization of results from a local to global scale and vice versa; the creation of local solutions based on phenomena and processes occurring on a global scale. It mainly concerns the functional analysis of each of the systems forming the geographical environment megasystem as well as its entirety, and it refers to the concept of space of place and space of flows developed in recent years and resulting from the theory of matter and energy flow in space (Brunn & Leinbach 1991; Sassen 1991; Castells, 1996).

The geographical environment, due to its specific character, shaped by the indefinite number of processes, phenomena and objects which undergo constant evolution or emerge and disappear spontaneously in space, constitutes an empirically open research subject (Degórski 2006). As a result, geography possesses an empirically open research subject, which undoubtedly constitutes another reason predisposing it to complex spatial studies, including the studies assessing mutual relationships between humans and the environment, which results in new processes, phenomena and objects occurring in space.

The abovementioned space of place, which is above all a sociological and philosophical category, is part of the human-environment system. Empirical notion of place is difficult to be defined mainly due to its complexity (Relph 1976). Although places are usually

characterized by a defined location and permanent identifiable features, the notion of place does not result from its location, function, or the community residing in the place or else from artificial or conscious experiences. The notion of place is much deeper and it can be discovered through examining the intentions underlying human behavior (Relph 1976). Place implies the location and integration of nature and culture (Walmsley & Lewis 1984), being at the same time an important element for every human being. People often identify with the place emotionally and its perception is highly influenced by the relationships occurring between natural and social systems. According to some researchers, geographers have attached too much importance to natural and social environments as a determinant of human existence, which is rather beyond human will. In the analyses of human-environment-place relationships, experience is a more important research subject, as it makes it possible to understand how human feelings and thoughts are linked with events and places (Gibson 1978).

In recent years, geographical research has experienced an important development of the paradigm of an intersubjective study of the environmental megasystem. In physical geography, such an approach is reflected in moving away from the studies of objectively existing landscape towards the study of the environment of a certain subject, and especially the living environment of people and communities (Ostaszewska 2002). This approach is similar to the paradigm of human geography, where environment is perceived from the perspective of people and communities, thus being burdened with the lack of verifiability (intersubjectivism). The 'environmental' option in physical geography adopts similar assumptions, creating new opportunities of methodological rapprochement between physical and socio-economic geography.

In such a perception of reality, man is not only a passive observer of his geographical environment, but also a subject, taking an active part in its shaping (Buttimer 1996;

Degórski 2003), in particular in the creation of natural and cultural identity, and the generation of factors of socio-economic development (Barkers 2003; Degórski 2003, 2008; Lambin 2005; Meyer & Degórski 2007; Sedlacek & Gaube 2010). Researchers are taking into account the potential of the natural environment and its significant role in the shaping of conditions of human health and quality of life. Together with social wellbeing and high psychological standards (Gawor & Głębocka 2008), they determine individual behavioral attitudes in the context of space of place.

### **Cognitive behaviorism in determining the relationship between human and environment**

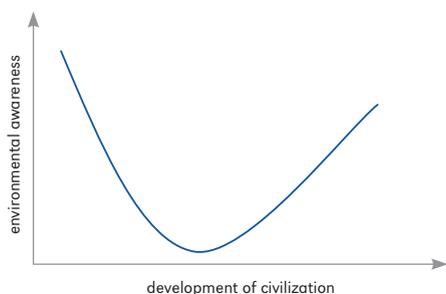
Humans, since their appearance on Earth, had been developing in harmony with nature, which had already been stated by Alexander Humboldt in his treatise *Kosmos*. Nature had been human shelter, a source of alimentation, as well as a working and living environment (Redman 1999; Degórski 2007). Depending on cultural differences, the components of nature had often been perceived as sacrum, treated with due humility and reverence. For a human being, the natural environment had thus been important from the ontological, epistemological as well as sacral point of view. However, together with civilizational development, the functions of the natural environment were re-evaluated in the context of social life. Humans, by creating their own anthropogenic system, concentrated on bringing it to perfection, whereas the system of natural environment was treated as its more and more distant surrounding. The natural hierarchy of values, resulting from inherent, inborn and instinctively perceived existential conditions, was undergoing a gradual evolution, heading towards the depreciation of importance of the natural environment in the life of individuals as well as entire societies. Nihilistic attitudes, more and more frequently adapting to reality, created the image of homo sapiens as the conqueror of nature, able to transform and adapt the environment

to their needs and visions, often without realistic economic calculations. In the 19th century and 20th century, it resulted in rapid devastation of the natural environment, excessive exploitation of its resources, in particular non-renewable ones. The menace of depletion of some resources emerged, concerning in particular energetic resources necessary for our existence on Earth and difficult to be substituted at that level of civilizational development. Humanity of course, is obliged to deal with this problem by undertaking subsequent attempts to produce biofuels (Ma & Hanna 1999) or obtain the energy from renewable resources (Hollwey 1996; Iniyana 2000).

The end of the 20th century was marked by a visible shift in human behavior in different regions of our planet. Landscape quality was becoming increasingly important for settlement as well as for locating enterprises. It is necessary to note that, while the location of service sector companies is unrestricted, it is increasingly conditioned by landscape quality. A growing number of people want to live and work in an environment characterized by a landscape free, as much as possible, from the results of anthropogenic impact, characterized by spatial order and good sanitary conditions. All these features result in the increased environmental awareness of societies. Human inborn sensitivity towards nature and symbiotic coexistence of human and natural environments has been revived. It can thus be argued that the societies of highly developed countries are experiencing the

renaissance of pro-environmental attitudes, which results mainly from their inner need and partially from their self-preservation instinct, which calls for a more rational use of environmental resources (Fig. 1). It concerns numerous aspects of our life, among other things, the optimization of water resources management (Wisserhof 1995), air quality improvement (Holgate et al. 1999), or the protection of soil resources (Doran et al. 1996; Karlena 2003).

The shift in human mentality, and the need to shape the space of place in strong connection with the natural system, results in suburbanization processes, i.e. the escape of people from the area that they had very strongly shaped themselves to the place where natural and semi-natural processes have a greater impact on the environment. Human desire to be closer to nature influences the correct functioning of the geographical environment megasystem. A decision to move to an area closer to nature is perceived as added existential value, whereas for nature, it results in the increase of stress and disturbed functioning. According to the research of Degórska (2008, 2012), in the last 15 years, settlement in Warsaw metropolitan area moved to the zone with a radius of 50 km from the core of the city. The zone of the most intensive settlement processes is also moving further away from the city border. At present, this area is located 30 to 40 km from the city (Degórska 2012), which proves that human influence on open territories of big urban agglomeration has been very dynamic in the last decades.



**Figure 1.** The relationship between civilizational development of societies and their environmental awareness

### Diversity of social attitudes towards environmental issues in Warsaw agglomeration

Spatial development of urbanized areas and increased civil pressure, as well as a rise in the level of education (particularly in the field of ecology) means that in Poland, we can observe an increasing sensitivity of people towards the values of the natural environment. In addition, we also see an increased sensitivity to the natural environment's role in the development of social-behavioral

attitudes that are connected with the assessment of the surrounding world – in particular, the perception of place. This thesis can be proved by looking at the very interesting results of the studies on space of place in the context of human perception of issues connected with environmental resources, performed based on a pilot survey conducted in the Masovian Voivodeship (Central Poland) on a sample of 2000 respondents. The author presented preliminary results concerning one of the communes and the research methodology in his earlier paper (Degórski 2008b). However, new facts described in the work of Degórski (2012) encouraged the author to extend the scope of research and take into account communes located in the zone characterized by the strongest settlement pressure in the Warsaw metropolitan zone. The towns chosen for the purposes of the survey were located 20-40 kilometers from Warsaw, but within its metropolitan area; Otwock located ca. 25 km southeast from the center of Warsaw, Dębe Wielkie located 30 km east from the center of Warsaw, Mińsk Mazowiecki ca. 40 km in the same direction, and Piaseczno, located ca. 20 km south from the center of Warsaw (Fig. 2).

The towns and villages are located in the zone of influence of the capital city and are all characterized by important residential and recreational function. Space of place is perceived by the inhabitants as a hedonistic value, which ensures the highest living standard, i.e. good accommodation conditions, rest and

relaxation. One of the numerous questions connected with the perception of environment concerned the assessment by local community of the influence of natural conditions on the attractiveness of their space of place. The highest number of positive responses (91%) to the question formulated in this way was recorded in Otwock, a town with an important spa potential, benefiting from its location rent in an attractive forest complex. All respondents (irrespective of such criteria as age, education, sex) stated that natural values of the Masovian Landscape Park bordering the town increase its attractiveness as a place of residence; as many as 98% of the respondents saw the natural values of the town as a chance for a positive influence on its economic development. They claim that, apart from their personal positive perception of the influence of the quality of environment on the standard of living in their space of place, natural values may also result in an important improvement. This improvement is in the form of the town's financial condition, through an increase in its attractiveness for the location of enterprises and services connected with the broadly understood medical sector, as well as in the development of the spa and touristic function of the town and region. The inhabitants of Otwock also emphasized the importance of implementing the rules of sustainable development in the town's expansion and functioning.

Environmental issues in the space of place are perceived in a slightly different way by the



**Figure 2.** Location of the studied towns and communes of the Warsaw Metropolitan Area

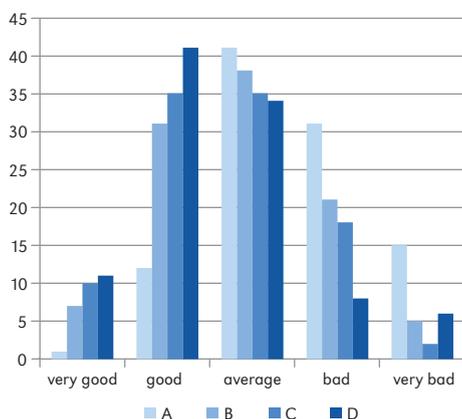
local community of Dębe Wielkie (a rural commune). According to the inhabitants, the most important factor connected with the optimization of the standard of living is the improvement of the condition of technical infrastructure, and in particular the quality of water. Very interesting results were also obtained in the survey in connection with the attitude of local the community towards green areas as an integral part of green infrastructure; 53% of respondents assessed their condition as satisfactory, 27% as good and very good and only 15% as bad and very bad.

Similar results connected with the maintenance of green areas were obtained in the Piaseczno commune. The inhabitants, when asked how they assess the condition of the natural environment – including the condition of forests, parks, roadside wooded areas and green areas in residential districts – expressed a positive opinion in the majority of analytical units reflecting the division of Piaseczno into research zones. The most satisfactory results were obtained in the zone of agricultural lands (D), where the majority of respondents assessed the condition

of the natural environment as good (as many as 41% of respondents) and average (34% of respondents). For 11% of respondents, the condition of green areas was very good, while for 8% bad and for 6% very bad. The inhabitants of Piaseczno express the most critical approach towards the condition of green areas, as for 41% of respondents, the current condition of the natural environment is average, for 31% bad and for 15% very bad (Fig. 3). In the zone located in the near vicinity of Warsaw (zone B), according to the majority of respondents, the condition of the natural environment in their place of residence is average (36% of respondents) and good (31% of respondents).

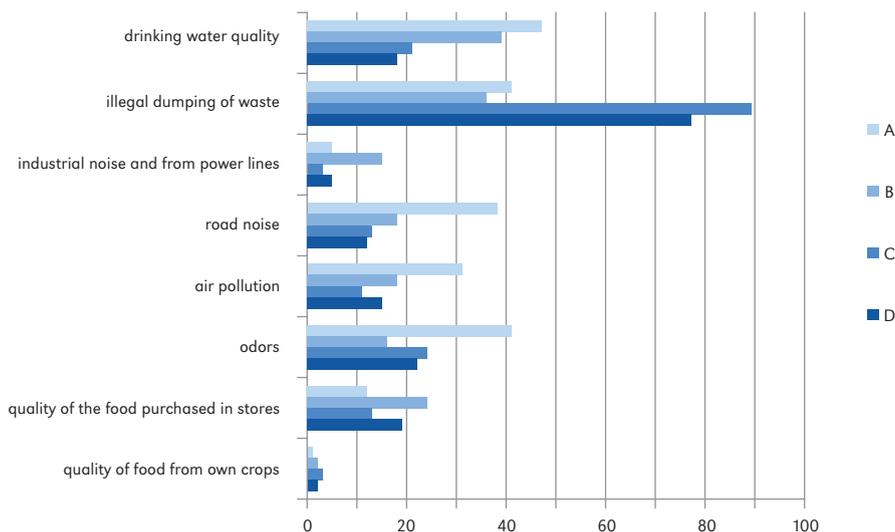
Another problem connected with the perception of space of place in the context of the human-environment relationship is the sanitary condition of the environment and its influence on the health of the population. An important factor in the perception of space of place is thus constituted by human awareness of the occurrence of natural, as well as anthropogenic, risks in the system of the geographical environment that may pose a threat to human health and safety. It is the most serious problem in the context of the functioning of the natural environment for over 80% of respondents. For instance, according to the analysis of results of questionnaires conducted in Piaseczno, divided into research zones according to their location, the dominating function of land use as well as employment structure, different points of view of the local community can be presented in connection with the subject of research, which results also from a different scale of influence of subsequent hazards (Fig. 4).

Questions presented to the respondents were multiple-choice, with a possibility to choose from one to three answers. According to the inhabitants of the urban (Piaseczno), and suburban areas (between Warsaw and Piaseczno), the quality of water constituted a major health hazard. This risk is put in the first place by nearly 46% of respondents in the town of Piaseczno and nearly 40% in its suburban area (zone B), while in the



**Figure 3.** Respondents' assessment of the condition of environment in analytical zones of Piaseczno commune

(A – the town of Piaseczno, B – areas adjacent to Warsaw, C – areas where agricultural function prevails, D – agricultural lands located furthest from Warsaw)



**Figure 4.** Main health hazards in the social perception of subsequent research zones of Piaseczno commune in the context of quality of natural environment

(A – the town of Piaseczno, B – areas adjacent to Warsaw, C – areas where agricultural function prevails, D – agricultural lands located furthest from Warsaw)

remaining two zones, being mainly agricultural lands characterized by their own water intakes, the percentage drops below 20% of respondents (Fig. 4). For local communities, the problem of waste landfills located in their surroundings is perceived in a different way. In agricultural areas (zones C and D), the perception of this hazard as the most significant for inhabitants' health is the most visible. In the area located in close proximity to Chojnowski Landscape Park, ca. 89% of respondents perceived it as the most significant for their health, while in the second zone where agricultural function prevails (zone D), the percentage reached over 77% of respondents. In urban and suburban areas, less than 40% of respondents assessed this factor in their questionnaires as important for their health. Road noise and air pollution (Fig. 4) were other important health hazards pointed out by inhabitants of the urbanized area.

In all locations studied according to the space of place, local communities referred to the positive influence of sustainable development solutions on their quality of life.

Nevertheless, it has to be said that the percentage of respondents describing this influence as very significant and significant did not exceed 50% in each research location, which results partly from the level of education, but is also caused by social policy of local authorities, often excessively concentrated on economic development without taking into account environmental factors.

### Environmental potential paradigm

The evolution of attitudes of societies of various states towards the role of the natural and cultural environment in the functioning of socio-economic system results in the fact that the improvement of the quality of life is no longer perceived as caused exclusively by economic and social development. For them, it is also caused by the optimization of the use of the natural environmental potential and management of its resources (Dupont et al. 1998; Gunderson & Holling 2002; Berbeka 2005; Murphy 2006). The potential of the natural environment is usually

understood as all environmental values and resources creating the natural system's capability to satisfy broadly understood (physical and psychological) human needs, present as well as future, together with self-regulatory and immune mechanisms maintaining this capability in the environment.

In geographical studies, a lot of attention is devoted to the potential of the environment (analyzed in various spatial scales, from local to supraregional), its broadly understood resources, including landscape and cultural values, as well as functional links with other components of the geographical megasystem (Legendijk & Cornford 2000; Degórski 2012). The environment is also perceived as a factor capable of generating development trajectories, which, because of their concentration, create attraction points, i.e. attractors, having their attraction area, called basin of attraction, deciding among others about the so-called stickiness of the place. According to general system theory by von Bertalanffy (1973), an attractor is the area or point in a certain space of states at which the system aims and around which the system remains at an unrestricted time scale, subject to the evolution of chaotic systems. The system is considered chaotic when in its state space map, saddle points, homoclinic intersection points (intersection of the inflow and outflow of the same trajectory) and heterocyclic intersection points (intersection of the inflow and outflow of different trajectories) are observed. Due to the presented features of the course of the development trajectory, the values of the natural environment do not always decide about the attractiveness of a given place with equal force. As it is commonly known, even slight initial differences in environmental potential may result in a radically different outcome and, furthermore, the course of development trajectories is highly influenced by the interacting economic and social background of the natural environment system. This feature of each place in space is also responsible for the drainage of human and economic capital from the external system, and then for its anchoring (holding), enabling to obtain

a temporary state of social and economic equilibrium. This state can stabilize or undergo further development processes under the influence of endogenous and exogenous factors. Attractors, being the equilibrium points attracting each trajectory of a given dynamic system constitute, thanks to the non-linearity of social and natural relationships, a factor, which in specific conditions creates the systems characterized by metastability (Domański 2008; Liu et al. 2009; Degórski 2013). In the search of development attractors created by the environmental potential, artificial neural networks, so called multilayer perceptrons, can be used as a modern tool enabling the performance of multifactorial analysis of data characteristic for environmental resources and quantified landscape values. Artificial neural networks are used with success in different scientific disciplines. They enable an unrestricted creation of models of linear, as well as nonlinear, functions as well as control the complex issue of multidimensionality which, when other methods are applied, considerably hinders the attempts to model nonlinear functions (in particular the functions with an important number of independent variables, so called vector functions).

The potential of the natural environment can thus be treated as one of the most significant subjects of geographical research, the study of which creates the possibilities of identifying development directions for a given space of place. In such a case, the research scope is often wider than the interests of geographers, which results from the synergic influence of different development factors of psychological and mental origin.

Another key element in the research procedure for the environmental potential paradigm is constituted by an attempt to assess its value in the context of supply and demand. Ecosystem services are increasingly used for this purpose. Ecosystem services are understood as nature components, which are directly consumed, perceived or used to increase human wellbeing (Boydem & Banzhafem 2007). The service is thus the 'final product' of the ecosystem and not a natural process in the course

of which it is created. In this way, it is possible to measure a given service and perform its economic valuation. The abovementioned functions cannot thus be treated automatically as ecosystem services, as there is a certain chain of interdependencies between the ecosystem and human wellbeing, where the service constitutes a 'bridge' (de Groot et al. 2010). The notion of ecosystem services is, in general terms, defined as a set of ecosystem products and functions (e.g. water and air purification, production of oxygen, recreation) that a person/community benefits from (Costanza et al. 1997). According to their functions and effects, services offered by nature are divided into the following categories: provisioning services, regulating services, supporting services and cultural services (TEEB 2008). The integration, study and understanding of these four types of benefits in the concept of ecosystem services is now among the greatest challenges for specialists in various scientific disciplines, managerial staff, policymakers as well as the entire society (Sutherland et al. 2006, 2009; Burkhard et al. 2010). Even if the notion of ecosystem services was already formulated in the second half of the 1990s (Costanza et al. 1997), genuine development of this scientific branch has only recently occurred (Lenda et al. 2010). It is also emphasized that some of them are difficult to be observed (Vejre et al. 2010) and are defined as a hidden value.

## Conclusion

The essence of research on the relationship of human-environment-space of place presented in the paper demonstrated the importance

of these studies for a better understanding of the functioning of the geographical environment megasystem, in particular in the context of human perception and actions conditioned by environmental potential for the improvement of the quality of life. This very old geographical research direction remains up to date and generates new research methods, sets of concepts, empirical models and, finally, it may lead to the formulation of theories creating the basis of a new geographical research paradigm. Detailed theories and notions of environmental potential paradigm will thus be embedded with experimental (historical) data, which is now being verified. This research approach is, and will continue to be, in close correlation with the intersubjective research paradigm of the space of place, perceived individually and not subject to scientific verification processes. It is also necessary to emphasize that correct identification of the discussed interdependencies is crucial for determining development directions for subsequent units of geographical space and optimizing living conditions (Connelly & Richardson 2004). The 2011 Human Development Report argues that "(...) bad environment and bad health are two overlapping deficiencies, very strongly correlated with each other". Geographers should thus make every effort possible to increase human living standards. In this way, the space of place of every human will become unique in both a noological as well as an ontological sense.

Editors' note:

Unless otherwise stated, the sources of tables and figures are the author(s), on the basis of their own research.

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