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Von Environmental Governance zu Landscape Governance: Multi-Level-Governance und Politics of Scale

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Landscape Governance

The "politics of scale" and the "natural" conditions of places

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Abstract:

Governance has definitely become a very iridescent concept in recent years. The term is widely used, meanwhile, in almost all social-science disciplines as well as in the political process. The intention of this paper is not so much to clarify these sometimes vague meanings but to highlight some special characteristics of environmental governance connected with the restructuring of the spatial dimensions of politics. It starts from the assumption that the quest for multi-level decision making is particularly pressing for environmental governance. However, multi-level governance raises concern about the constitution of various spatial levels and their relationships with each other, as discussed under the term of "politics of scale". Moreover, it is argued that for environmental governance the spatial reference is strongly connected with another challenge, which concerns the question of how to deal with the biophysical conditions of particular places? The term landscape governance is introduced to tackle this question without referring to an ontologically given space. Thus, landscape governance deals with the interconnections between socially constructed spaces (the politics of scale) and "natural" conditions of places. For this task, the concept of societal relationships with nature is introduced and applied to the term "landscape" as a bridging concept between social and natural sciences. The paper illustrates the approach of landscape governance with examples of problem-oriented interdisciplinary research at the UFZ-Centre for Environmental research in Leipzig, eastern Germany.

10 630 Words (including references and foodnotes)

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Introduction: pathways to environmental governance

To a certain extent, the field of environmental policy has been paradigmatic of the search towards new modes of political steering, dealt with under the term governance. Looking back as far as the early 1980's, state failures regarding environmental problems were an early indication that it was insufficient to develop policy responses "from the top down". In the late 1980's and 1990's, the quest for new policy options was animated by a plethora of new instruments and an expansion of the spectrum of players. In particular, for transboundary issues at the international level, environmental governance became paradigmatic in the search for new forms of regulation concerning collective problems. Nonetheless, it took until the second half of the 1990's before respective developments were discussed as a general tendency within the restructuring of politics, and their strengths and weaknesses were analyzed more deeply. The term "environmental governance" became sufficiently mainstreamed for this realignment of political regulatory measures in the broadest sense (Young 1997, 2002; Kanie and Haas 2004; Durant et al. 2004).

This extension does however, have a dark side as well. Governance, as the term used in reference to environmental problems and beyond, has undoubtedly become one of the most iridescent scientific concepts in recent years. Despite its analytical 'uncertainty', the term has been used again and again in almost all social-science disciplines, from economics and political science to sociology, jurisprudence and administrative science. It has even transcended the traditional social-science arena and moved into the realm of both politics and the general public. Unfortunately, certainty regarding the term's meaning has evolved into an inverse relationship to its frequent usage. Not only does the word have many different meanings within the various disciplines in which it is used and defined, more than this, differences within the various disciplines, between different sub-disciplines and various theoretical approaches are by no means less meaningful. However, the aim of the following contribution is neither to clarify this complex meaning nor to present a complete overview of the multifarious styles of

inter-disciplinary application. Instead, it deals only with one very important aspect of governance in general and environmental governance in particular: its spatial dimension and the relevance of spatial scales for governance processes. In particular, recently, for environmental problems it has become ever more obvious that the question of scale is crucial with regards to the articulation of those natural issues involved, as well as in the search for policy responses (e.g. MA 2003, 2005; Cash et al. 2006; Young 2006). Therefore, the quest for multi-level decision making is particularly pressing for environmental governance. This contribution argues that multi-level governance raises concern not only about the interconnections between existing levels of decision-making but also about the constitution of the various levels themselves and the relationship they have with each other. Such questions are discussed under the term of a "politics of scale" (Swyngedouw 1997; Keil 1998; Brenner 2001, 2004; Jessop 2002a; Brenner et al. 2003).

In these discussions the up-scaling and down-scaling of statehood is analysed and therein scale is examined concerning the social processes of the social construction of scale. The focus on the social construction of scale, as was recently argued (Brown and Purcell 2005; Bulkeley 2005; Meadowcroft 2002), is also very important for environmental problems, and consequently, environmental governance could highlight some particular characteristics of scale theory (McCarthy 2005; Desfor and Keil 2004). For environmental governance, however, the question of scale represents a particular challenge, which can be posed by asking the question: How can environmental issues be dealt with in the face of socially constructed political scales? Behind this challenge two different but connected questions arise: First, in what way can the general relationships between social and natural processes be adequately operationalized? This question becomes an important challenge in various fields of environmental policy and research on global change (i.e. GLP 2005; Potschin and Haines-Young 2006) and is particularly pressing in regard to the relationships between ecological and social scales (Rothman and Rothman 2003; Young, et al. 2005). The second question concerns the very nature of social construction processes and the way in which social construction deals with natural conditions (Braun and Castree 1998; Castree 2003), i.e., with respect to the material-biophysical conditions of particular environmental problems. An important aspect of this question concerning the nature of construction is represented by the spatial aspects of environmental problems: In what way can the particular biophysical conditions of concrete places be dealt with while analyzing the social construction of space? Concerning this question, it is argued that the term "landscape" could be useful (see: Meadowcroft 2002; Potschin and

Haines-Young 2006; Antrop 2006), although some clarifications of terminology are necessary. Thus, the aim of the paper is to examine multi-level-governance and the politics of scale against the background of "natural" conditions of existence. For this purpose, the term landscape governance will be introduced.

This shall take place in five steps, beginning with a core definition of the term governance in which a short overview concerning the historical changes connected with the emergence of this concept shall be given. Emphasis shall be placed on the question: How have changes within specific subject areas influenced the expansion of the term governance? It is contended that these changes are connected with deeply-rooted changes in the relationship between the (national) state, the economy and society. However, this does not mean, as is often suggested, the decline of the national state as such. Rather, it refers to a transformation of statehood and a restructuring of its spatial organization. In the *second* step, these changes shall be investigated with regard to the social construction of these spatial regulatory levels and their relationship to each other. Multi-level governance is more than just the existence of various levels of negotiations and decision-making. It also encompasses the formation and reshaping of these levels and the relationships the various levels have with one another, including the power relations involved. Therefore, we must consider what is called a "politics of scale".

It is argued that the spatial reference of governance is of fundamental relevance to this term's meaning. However, in reference to environmental governance two further questions arise: Firstly, how can we refer to environmental issues without neglecting scales as socially constructed entities? And, how can the insights of (natural) science be incorporated into governance processes? Regarding the first issue, in a *third* step, the concept of societal relationships with nature is introduced and applied to the spatial dimension of social processes. In a *fourth* step, the term "landscape" is used as a bridging concept between the discussions of social scales and the biophysical conditions and ecological processes in spaces. In a *fifth* step, the usefulness of this term will be displayed by referring to examples of interdisciplinary problem-oriented research at the Centre for Environmental Research (UFZ). These examples accentuate, in a particular way, the role of (natural) scientific knowledge within governance processes as well as in relation to other forms of knowledge and therefore, they provide illustrations of the concept of "landscape governance".

1. Core meaning and the historical development of the governance concept

Despite the prevailing heterogeneity in theoretical explanatory-approaches, a certain concordance exists in the general description of governance processes, because their core meaning revolves around the altered role of the state and government: "These new perspectives on government – its changing role in society and its changing capacity to pursue collective interests under severe external and internal constraints – are at the heart of governance" (Pierre and Peters 2000, 7). Benz (2004, 25) refers to the following elements as being at the core of this concept: administration and/or co-ordination between various actors, based on institutionalized systems of regulations, which usually represent combinations of market, hierarchy and other systems of regulations, and which generally overlap the borders of organizations or the borders between politics and society (and even the borders between other sub-systems such as the economy and law). The description of governance processes refers to altered constellations of various actors as well as an altered role of political institutions, especially that of the state.

"What previously were indisputably roles of government are now increasingly seen as more common, generic societal problems which can be resolved by political institutions but also by other actors" (Pierre 2000, 3-4).

Typical of these debates is the change between altered *expectations* regarding the state and its "indisputable roles", on the one hand, and the reference to *real transformations* in the relationship between the state and society, on the other hand. Certainly, the two aspects do not exist separately, one from the other, but neither do they overlap. In particular, it is not always easy to differentiate whether unrealistic expectations regarding the leadership-function of the national-state are just being "demystified" (Willke 1983), or whether the changed role of the state within society is really being analyzed. The rectification of unrealistic expectations does not concern all theoretical directions in the same manner, and from the point of view of other theories, many "demystifications" are hardly representative of any kind of genuine increase in awareness. However, when one analyzes the historical changes that have accompanied the gradual rise of the term governance, then transformations in the relationship between state, politics and other societal sub-sectors become obvious, discussed (but sometimes only vaguely comprehended) under the term "Globalization" (compare for an overview: Pierre and Peters 2000, 163ff; Held and McGrew 2002; Hirsch 2002; Jessop 2002a). At the heart of this

process we can observe a re-articulation of politics at different spatial levels (see Brenner et al. 2003).

Despite the controversy surrounding the explanation of this process, there still exists a broad consensus regarding the symptoms that pre-empted such a transformation. What we are observing is the dismantling of established areas of authority regarding territories, functions and sectors which concern more than just the area of politics (Rosenau 2004). The interplay between multifarious procedures for public decision-making and administrative processes (on a national, international and communal level), between private and public regulatory areas, between the relationships of market processes and their political and social pre-requisites as well as related political regulations (commercial, environmental, educational and social politics), have all begun to shift and generally come into motion in a complex, context-specific manner. The assumption of a "disappearance of the national state", which for a long time now has been the guiding thesis, is gradually being pushed aside for a more differentiated analysis of a complex amalgam of public and private processes at numerous levels, in which a multitude of various actors are involved, including the national state (Jessop 2002a).

In stating that the term governance is connected with transformations of the national state and shifts in the relationships between the state, economy and society, two aspects are central for further discussion: the new constellation of actors, and the spatial reference (regarding political decision-making processes and shaping processes). Societal regulatory and shaping processes take place in an environment which has dismissed the national state as both the central (and even the only) actor as well as dismissing the national level as the unquestioned arena of political shaping - but without having dismissed the national level of statehood itself. In contrast, governance is itself a central aspect for the introduction of "new state spaces" (Brenner 2004). However, what has disappeared over the past 25 years is the special articulation of the national state and its relationship to the economy and society, which took shape in most industrialized countries after World War II. Referring to the regulation approach in political economy this phase of social development is analyzed under the name Fordism (see Hirsch 1998; Jessop 2002a). The transition to a Post-Fordist constellation of state, economy and society has developed differently within the various industrialized states as well as being an extremely heterogeneous transition in newly industrialized countries. Nonetheless, analyzes of new spatial constellations can approve this shift as their starting point (see Jessop 2002a Brenner 2004; Brand et al. 2007; and the contributions in Brenner et al. 2003).

2. New state Spaces and the Politics of Scale

The most important advantage of the regulation approach is that it provides a way of explaining the overwhelmingly deeply-smothered societal developments that lay behind the transformation of statehood, and in particular, regarding the globalisation processes and the emergence of global governance (Brand 2005). Regarding global governance, the debate began in the early 1990's with the strong thesis of "governance without government" (Rosenau and Czempiel 1992), which is referred to more recently as only one and more marginal type of governance. Moreover, in most contributions about globalization, the relationship between the national and the global level was grasped as a zero-sum game: the increase in meaning at the global level was explained at the expense of the national level. Correspondingly, globalization was defined as denationalization (Zürn 1998). This shift was primarily explained by the way in which processes of economic and, in part, cultural globalization, undermined politically-defined territories.

Indeed, it can hardly be denied that political and economic spaces are no longer equal in coverage (if indeed, it can even be contended that this is really a new diagnosis: see Marx and Engels 1980 [1848], 466). However, this does not necessary imply a disappearance of states or governments nor an undermining of the national level. Most global governance processes, in environmental policy and beyond, are based upon treaties between governments, even when these treaties focus on the regulation of transboundary issues. Therefore, intergovernmental agreements are at least part of global governance. Thus, "governance with government" is the normal case and the relationship between the international, the national and sub-national levels remains crucial (see for an empirical investigation of Biodiversity Governance: Brand and Görg 2003; Görg and Brand 2006; Brand et al. 2007). Nevertheless, multilateral environmental agreements represent an emerging level for policy-formulation. This level is not reducible to the national level and it embraces, in a selective manner, the interests of the different actors involved, dependent upon the respective power relations. Among them, the most powerful are the dominant states, albeit other actors like global non-governmental organizations (NGOs), transnational corporations (TNCs) or business organizations are involved. Over the last years it has become more and more obvious that the national dimension has not disappeared, even while other levels have becomes more important. Hence the tensions between and within different political and societal levels has increasingly begun to re-

ceive more attention. Governance is, therefore, primarily involved with the diversity, dynamics and complexity of present-day societies (Kooiman 2000; Jessop 2002a and b).

In line with the heterogeneity of governance, we are not only confronted with processes of "up-scaling", but also with those of "down-scaling". This means that statehood has increasingly transformed itself as much to levels *above* as to regional levels *below* the national state (particularly in regard to urban regions; cp. Brenner 2004). The most striking feature of the current situation is not so much the existence of decision-making processes at the various spatial levels *as such;* rather, it is the increased significance which is being attributed to the levels below and above the national level, and hence, the shifts occurring in the *relationships* of the levels to one another. According to Brenner (2004), cities (municipalities) and urban-regions are no longer simply sub-units of the national state. More appropriately, a special role is attributed to them in the "rescaling of national state power". This is displayed through the process of globalization in which the national state is hollowed-out "from above"; at the same time as the regional level and the role of the "local state" are strengthened (Keil 1998). However, this is not to be confounded with the increasing autonomy of the local level as urban decision-making processes are acquiring a growing significance within regional competition processes, having to ensure (each according to their own particular style) their integration into the world economy. In order to be able to appropriately comprehend these shifts, the different levels should not to be perceived as ontologically given entities; rather, they must always be analyzed in their changing relationship to one another. Two more dimensions can be added to this: in the analysis of these relations, the power relations and the hierarchical interconnectedness between the levels must be taken into consideration and they should not be perceived as being clearly differentiated units.

"For, insofar as terms such as local, urban, regional and so forth are used to demarcate purportedly separate territorial 'islands' of social relations, they mask the profound mutual imbrication of all scales." (Brenner 2004, 7)

The rise of the notion of multi-level governance (Bache and Flinders 2004) must be seen against these transformations. It does not necessarily involve clearly defined levels of decision-making. Instead, it is more likely the case that the levels overlap with one another and are often times not at all clearly separated. At the regional level, local actors and processes, national laws and international/global conditions (global economic competition, international

political programs and research projects) are involved. And the international level becomes important for the protection of local knowledge and regional peculiarities (for example, in some international conventions at the UNESCO or in Article 8j of the Convention on Biological Diversity). These are, moreover, linked with national governments and power constellations. Indeed, even local conflicts often reveal a feedback, in manifold ways, to national and global actor constellations. Magnusson and Shaw (2003) show, using the example of the conflicts involved with the felling of trees at Clayoquot Sound on Vancouver Island, how the manifold dimensions of a conflict of a local/regional, national and global nature overlap with one another.

The success of governance processes at one of the levels, for example the local level, is therefore dependent upon its relationship to other levels (referring to national laws, international agreements, regional and local actor constellation, etc.). Thus, the relationships between the levels and the possible hierarchies that exist between them are of major significance. During the period of the Fordist Welfare and Social State, this question was relatively and clearly articulated and understood, insofar as primacy in political shaping was accorded to the national level. Herein, international and regional shaping processes were clearly subordinate to the national decision-making level, which was recognized under national sovereignty, defined by the government (i.e. the current party carrying the government in the national interest) and implemented into national laws. However, in a post-Fordist constellation, the question is much more difficult to answer, in that the facts and circumstances are by no means decided a priori. The national state is no longer the central, pre-determined level of political processes; nor does it command the greatest power of shaping in relationship to other levels. Conversely, it is the international level (or the supranational level in the case of the EU), which, in many respects has attained primacy in the agenda setting process and in political formulation, insofar as, for example, environmental measures are today often initiated and decided at the international (or EU) level (see McCarthy 2005 for some examples). Nevertheless, the national level retains an essential function with regard to implementation, as evidenced by the way in which most international (environmental) agreements has generally only weak sanction mechanisms in order to enforce national compliance (Görg and Brand 2006).

The conditions regarding the regional/local level are certainly the most complicated, because it is here that completely antithetical processes can be observed. The increase in significance of global cities in the context of globalization processes (Sassen 1994) is at odds with the loss

of significance of marginalised regions which are hardly able to profit from these processes, even if they are officially meant to be fortified according to the international agreement (for the case of the south of Mexico, see Brand and Görg 2003). It is becoming increasingly clear that the relationship of political levels to one another involves aspects of power: "Scale is, consequently, not socially or politically neutral, but embodies and expresses power relationships" (Swyngedouw 1997, 140).

3. Societal relationship with nature and the production of places

Behind the expansion of the governance concept, we can observe complex shifts in the relationship of state and society, which primarily revolve around a spatial reference. The themes of multi-level-governance refer, moreover, to a "politics of scale" which is concerned with how the political decision-making levels themselves are produced and which power relations are involved. There is, however, a further problem hidden within this question which is essential to environmental governance: the reference to natural scales. Until now, spatial aspects were mentioned primarily in reference to political decision-making levels or, more generally, to the scale of social action. Nonetheless, the question will have to be asked - at the very latest when environmental problems are processed - What role are natural factors to play and how are these involved in governance processes? Although there is growing concern on how to connect political and ecological dimensions of environmental governance, in the following we will address only one important aspect: In what way can we attend to the particular "natural" conditions of concrete places while also analyzing the social construction of spatial scales?

Swyngedouw (1997, 144) has condensed the problem down to the following formula: "place matters, but scale decides". On the one hand, all social living is connected to space and/or place ("placed or situated", ibid 142), and this refers to both the immediate sense of a spatial-temporal placement of social processes as well as the mediated sense of appropriation and control of "natural" resources. Indeed, such circumstances of social metabolism with nature are not "natural" in the sense of being unaffected; rather, they themselves typically represent socially transformed natural/spatial circumstances. Nevertheless, it must be emphasized that social processes are strongly interconnected or mediated (in German: "vermittelt") with those material-energetic circumstances of their existence. The concept "societal relationships with nature", coming from the Critical Theory in social research, emphasizes this dialectical relationship (Görg 2003).

In this sense, "place matters" because the social construction of scale is always connected with nature in its spatial existence. However, the shaping of societal relationships with nature depends on the socio-political level, or in other words, "scale decides". In this explanation, two different dimensions are incorporated, in which space in social processes plays a role, both as a *physical-material pre-requisite* for social processes (location or place) and as their *geographical scale* (Schmid 2003, 218). Central to the themes of environmental governance is the relationship between the social production of the space and the natural-spatial conditions of a concrete place. Nonetheless, the meaning and relevance of this relationship is underestimated too often. Sometimes, space *per se* is understood as physical dimension, measurable in meters (MA 2003, 108). In this case, the question in reference to its social construction is not raised at all, or at least not in its total scope. Conversely, the notion of a social construction of scale is sometimes exaggerated, making scale a somewhat vague concept (see Brenner 2001 and the critique of McCarthy 2005). As a result, the relevance of a concrete location and the natural-spatial circumstances of social processes are sometimes ignored. Moreover, the idea of natural limits in the social construction of scale is neglected (Meadowcroft 2002). The analyzis of societal relationships with nature precisely addresses this problem by dealing with the social construction of nature in its spatial dimensions without neglecting possible limits of its production (Görg 2005).

It is important to note, however, that the two aspects related to this issue – one referring to nature as a material condition and one referring to space as a concrete location – are not equal in their meaning. Unavoidably then, the question arises as to whether or not the concrete location ("place") is "more natural" and less produced than the spatial scale or space itself. Every place is, in two interpretations of the word, produced: in a materially-substantial way through human practice and within specific cultures or systems of meaning, including the sciences. All places are, in their material state, touched by human utilizations, whether they are intentional or non-intentional (such as the impact of pollutants upon water or air; with these reaching, as we know, all the way to the Antarctic). At the same time, as a concrete place, it is shaped by cultural patterns of perception (e.g. a concrete landscape like a valley; see Simmel 1993 [1913]). Although there is considerable societal influence, every place always contains specific material characteristics (of an abiotic – soil, water, climate – as well as biotic nature – specifically, fauna and flora). It is essential in this context that these characteristics are not perceived as being merely peripheral remainders, removed of all of the societal influences.

Rather, material conditions, even when modified by human action, persist through the process of social shaping, even in a modified form. No matter how often one drains rivers or swamps, there remain material links which manifest themselves, to some degree, in new kinds of problems: danger of floods, sinking of the water-table, etc. For the purpose of environmental governance we can comprehend a place not only as a spatially produced area, but as a natural-spatial entity as well, in the sense of material conditions of social processes. These two dimensions can, in the end, only be differentiated analytically. But this differentiation is equally important, in order to be able to analyze, more adequately, the concrete correlation between the process of human utilization/production and the limits of its constructability.[1]

4. Landscape and landscape governance

In a more precise manner, it could be argued that the problems of environmental governance begin precisely at that point at which the concrete relationship between the two aspects of "place", i.e. between societal production and natural-spatial conditions, becomes thematic. In order to analyze this relationship, various approaches are possible. For example, the city can be understood as such a place, not only comprising socially-produced space but specific material conditions as well: soil conditions, climate, water-ways, etc. (cp. Desfor and Keil 2004). I would, however, recommend working with a more abstract concept, one that quite emphatically addresses the unification of societal production and natural-spatial conditions: the *concept of landscape*. Ever since the exploratory voyages of Alexander von Humboldt (2004 [1845]), this concept has established itself in Geography and also in various natural sciences. Of most importance is the way in which the double-content of both natural and social factors is usually emphasized (i.e. Wascher 2000; Meadowcroft 2002; Antrop 2006; Potschin and Haines-Young 2006). Nevertheless, landscape in geography is a highly contested term which is not easily defined (for an overview see Mitchell 2001; Kemper 2003). In particular, the relationships between social or cultural and natural factors are not easy to determine. At a

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[1] Therefore a distinction should be made between the social production of scale and the natural conditions affected or transformed by this social production. Whereas McCarthy (2005, 735) suggests that we need no sharp separation between social spatiality and environment/nature, as argued in a critique directed against Brenner's (2001) definition of a politics of scale, for governance purposes it is important to know whether global scales are constituted by social, in particular political-economic processes or whether they are pushed by "natural" processes. Climate change, for example, is global in nature, but we have to carefully analyze its socio-economic and natural representation. Similarly, the global management of genetic resources has strong implications for changing power relations, that is: of a "politics of scale" (Goldman 1998; Brand et al. 2007). The approach of societal relationships with nature should therefore be seen as being dialectical ones which emphasize the interconnection of society and nature while at the same time stressing the need for a clear distinction between both (for a more comprehensive analysis compare Görg 2003).

basic level, landscape refers to the spatial-temporal aspects of the metabolism between nature and society. It therefore includes the biotic as well as abiotic elements of a concrete "earth region", including its societal forms of utilization (Haase 1991). With the emergence of Landscape Ecology, landscape can then be defined as: "a distinct, measurable unit defined by its recognizable and spatially repetitive cluster of interacting ecosystems, geomorphology, and disturbance regimes." (Forman and Godron 1986, 11) Thus, landscape, as a realm of human-environmental interaction, could represent the centre of future research into sustainability (Wascher 2000). However, more recently it has been argued that existing approaches of Landscape Ecology are not well equipped to deal with this challenge and the natural science concepts should be transformed to make them more politically relevant (Potschin and Haines-Young 2006).

From the perspective of the social sciences, however, the cultural constitution of landscape is emphasized. Georg Simmel (1993 [1913]), long ago, ascertained that it is precisely not the character of nature which makes a piece of land into a landscape; rather, it is the "mental act" of humanity. Simmel particularly underscores the aesthetic contents, which register the special "mood" of a landscape. But this aesthetic dimension, in which the origin of the landscape concept in the landscape paintings of the eighteenth and nineteenth centuries appears, also presents considerable challenges. In Germany, for example, the term "Landschaft" is connected with a conservative critique of culture, which stresses the adjustment to a given traditional form of cultural landscape (for a critique: Trepl 1997; Hard 2001). In other cultures and languages, different meanings are associated with the term. Even if most of these are not as problematic as the German one, the degree of cultural shaping becomes obvious.[2] With this cultural tradition as a background, the question arises as to whether the term landscape represents a meaningful concept at all within the natural sciences. Hence, it was argued that the social and/or cultural sciences should lead the way in landscape research (Trepl 1995; see the approach of Social and Cultural Geography: Kemper 2003). But in this development, the threat appears to be that the material dimensions of landscapes are underestimated or neglected. For this reason, more recently there has been renewed emphasis placed on the need for integrated approaches of nature and culture (Whatmore 2002). Since the individual dimensions within the social sciences as well as in the various natural sciences (ecology, study of soils and waters, etc.) are by no means easy to integrate, it appears that a successful transition

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[2] At least the German and the English traditions (see Hoskin 1955) are accused of harbouring racist inferences (see: Mitchell 2001, 277). See Antrop 2005 for a general analysis of cultural perceptions and their role in landscape management.

to a unified, holistic style of perception (as prescribed by Naveh 1995; Tress and Tress 2001) is highly unlikely (Antrop 2006).

Although it is necessary to keep these issues in mind, it can nonetheless be contended that the landscape concept represents at least a starting point for an applied, interdisciplinary environmental research, such as one of a distinctly hybrid character and, particularly, for research in environmental governance. The landscape concept, in all its multiple interpretations, fulfils the requirement of representing an object of both social production and natural-spatial conditions. In comparison with competing concepts such as space or nature/environment, the landscape concept offers the advantage of addressing various societal (aesthetic-cultural, economic, infra-structural) and ecological dimensions (biotic-abiotic, biodiversity, soil, water content, etc.). Furthermore, an awareness of problems regarding the utilization and alteration of landscapes has emerged in recent years, stimulating new kinds of natural and sociological research (Kaufmann 2005). Responsible therefore are processes of urban-sprawl or traffic infrastructure, leading to an erosion of biological diversity, as well as a growing awareness of the manner in which landscapes are utilized and/or altered.

Landscape-governance as a component of environmental governance comprises, at a minimum, the following aspects:

- Landscapes are *socially and/or culturally* shaped and constituted entities. This entails at least two dimensions: a practical shaping through socio-economic – technical processes (agriculture, traffic, settlements, etc.) as well as the cultural dimension in symbolic perception, such as "beautiful" or "typical". The heritage of the concept shines through in both dimensions, whether it be in the etymological dimension of "creation" (in particular in the German word "-schafft", which refers to making or creation) or the cultural heritage of landscape painting, which was prior to the scientific notions of landscapes.
- Social shaping of landscapes must, consequently, be the starting point for analysis. However, by the same token, this should not engender the unilateral shifting of the cultural or aesthetic dimension into the foreground (as crucial as it might appear to be for the perception of problems). As important as these social- and/or cultural-science aspects are: one cannot leave out the scientifically precise description of functional inter-connections in the circulation of substances. As the starting point for an inter-disciplinary collaboration, a *problem-perspective* is offered, which incorporates a balanced measure of cultural-

aesthetic dimensions (such as the perception of over-settlement processes) together with other social dimensions: What type of conditions does a given landscape offer—i.e. in reference to agricultural production and the reproduction of land? . How are ecosystem services like flood-protection affected by different measures? What are the impacts on biodiversity? What is the discernible impact of pollution? How is soil quality developing? etc…

- Landscape is then, neither a "pure" given entity, comprehended as an object of natural sciences, nor does it seem possible to treat it from a comprehensive, holistic perspective. Commencing from the social science viewpoint, one must always take into account the *plurality of landscape-comprehensions* as well as the multiplicity and dichotomy of *interests* related to a landscape. Dealing with landscapes as social constructions implies, that social installations cannot be described solely as given facts or isolated elements, such as a street or a farmyard. Rather, they must be grasped in their complex dynamic, whether referring to national or regional traffic policies, to national property rights systems or economic dependencies within the global economy, etc. In particular, a socioeconomic aspect connected with a particular landscape is by no means obviously a local entity referring to local scales of action. Avoiding the "local trap" (Brown and Purcell 2005) – the belief that the landscape is always or naturally connected with the local or regional scale – is essential for landscape governance.

- Landscapes no longer exist, *per se*, in juxtaposition to social institutions – as in the difference between city and landscape – and they can no longer be assessed according to their "naturalness". Instead, landscapes more likely involve a confrontation with different forms of nature's socialization: from quasi "nature-like" spaces such as protected nature-reserves (which do not exist, as such, without human intervention), to various forms of agricultural utilizations (whether small farms or industrial-agricultural operations), to urban areas or secondary landscapes consisting of industrial or open-pit mining utilizations (see below). Nature is, in this sense, not antithetical to culture/society or city/technology, as was contended for many years in landscape-ecological circles (even if it was suggested to overcome these dichotomies, see Haber 1990, 139). We can now speak, more readily, of various "natures" within the subject of urban-ecology (cp. Kowarik 2005).

- Landscape governance is neither exclusively nor primarily involved in the maintenance of "untouched", "natural" landscapes, nor is it necessarily in concordance with the maintenance of a specific uniqueness of cultural landscapes. Even though such normative implications are frequently connected to the concept of landscape, its basic definition includes

changes and transformations caused by natural disturbance or by human action. Thus, the idea of sustainability has to be clarified with regard to landscapes (see Antrop 2006; Potschin and Haines-Young 2006). This is not to say that actors cannot attribute a normative character to a certain landscape and categorize a typical cultural landscape as being something worth keeping. However, for governance processes this represents only one evaluation among many others and is, thus, an object of governance research, but not its normative foundation.

- In particular, the aesthetic dimension is not itself a normative starting point for landscape governance even though aesthetics play an important role in illustrating or indicating what is going wrong with ongoing transformations of landscapes. Indeed, Theodor W. Adorno (1970, 102), more than 35 years ago spoke of the "moment of a corrective right" regarding the aesthetic value of cultural landscapes. In understanding the "corrective right", Adorno was not concerned with either a landscape's naturalness or its traditional cultural character, which is emphasized in conservative critique of culture. Instead, he emphasized that the conservative critique was wrong to assume that a landscape is something immediate, and naturally connected with some traditional way of living. According to Adorno, aesthetic value is not based on the uniqueness of a given typical cultural landscape, but rather on the polemic tension in regard to the on-going "domination of nature" and the process of "social destruction of landscapes" – that is: their transformation into unsustainable patterns of use.

- Therefore, the basic notions of the cultural dimensions must be supported by the insights of natural-science in terms of the concrete repercussions of existing or past utilizations. This task should not, by any means, be underestimated. As mentioned before, in recent discussions the quest for better integration of natural science concepts and social science insights emerged (Potschin and Haines-Young 2006). To a certain extent, the respective research is still in its beginning stages (cp. the extensive discussions regarding landscape scale biodiversity assessment in Young et al. 2005). Still, the integration of economic and ecological models presents difficulties, since economic models frequently give no evidence of an explicit spatial reference (Drechsler et al. 2005). The landscape dimension in ecology represents an important link in the chain between a perspective directed at individual species or ecosystems and the overlapping national or global problems. Thereby, representing a meso-level between the local and the global, the term is used in a similar manner as it is in the social sciences. Even if it becomes increasingly clear, however, that significant problems have been articulated at the meso-level, it is by no means easy to in-

tegrate the different perspectives or the different levels, neither on the natural science side, nor in the social sciences. Moreover, the regional level is not an isolated dimension but does comprise - as shown above in the discussions of the politics of scale - national, supra-national, global and local dimensions. Nevertheless, it is an increasingly vital level for problem processing, in light of practical attributes.

- What seems to make the landscape concept useful as a link between governance processes in multi-level-politics and natural-spatial conditions is precisely its *hybrid* character, that is, that societal and "natural" factors are intrinsically linked to one another. Cultural, aesthetic, economic and social dimensions are as much involved as ecological functioning or abiotic conditions. Therefore, using the concept of landscape instead of the concept of region (cp. to Regional Governance: Pütz 2004) is a more appropriate way of incorporating these dimensions. Herein, landscape provides the rescaling of politics with a material foundation, without returning to presumptions regarding ontologically prescribed spaces.

5. "Interdisciplinarity" in landscape governance research - examples and experiences

The appropriateness of using the concept landscape governance as a means of grasping both social and natural dimensions of places can be demonstrated by a number of examples. The ones chosen here are all part of past or ongoing research at the UFZ-Centre for Environmental Research Leipzig-Halle (for more information see: http://www.ufz.de). The UFZ is situated in a very particular region in eastern Germany: the region Leipzig-Halle-Bitterfeld. Established in 1992, the UFZ was, from the beginning, designed to deal with the huge environmental problems of this region. In particular, the name Bitterfeld became prominent due to its association with the negative impacts caused by uncontrolled industrial, and specifically, chemical production and related environmental degradation. This whole region of Germany is referred to as the Central German coal district ("Mitteldeutsches Braunkohlerevier") and throughout it there are enormous lignite fields, one of which is situated south of Leipzig, which is referred to as the "Südraum Leipzig".

In the twentieth century a double transformation of the landscape in the "Südraum" took place resulting in two complete makeovers; the first occuring in the first half of the century, and the second, in the last decade, after German reunification. Both transformations are connected with huge environmental problems like soil and groundwater contamination, as well as with

deep rooted societal challenges, marked today by processes of deindustrialization, high unemployment rates and demographic decline. However, of most importance to the issue at hand is the fact that the regional dimensions of the problems involved are strongly connected with national and even global socio-economic and politico-economic processes which raises concern about a politics of scale while regional governance processes, in turn, have to come to terms with the environmental conditions of these particular places.

Beginning in the 1920's, the lignite in this locality was primarily exploited for power generation and the carbo-chemical industry. After WWII this transformation was further intensified and the whole region became one of the biggest industrial zones of the former German Democratic Republic (GDR). In the "Südraum", many power plants and chemical factories were built, making this region one of the most environmentally affected areas of the GDR. Huge parts of the district Borna were transformed into open-cast mines, leading to profound devastation of landscapes. Indeed, up until the present time, 228 km^2, that means 62,6 % of the district Borna, has been converted into mining areas. Less then 50 % were re-cultivated before 1989, and as of 2002 the number came to only 68,1 % (Bischoff et al. 1995, 11; Berkner 2004, 218). Moreover, in the whole region, 137 villages were abandoned and destroyed and more than 50 000 people were resettled into towns and villages close to the region (Berkner 2004, 218).

After the collapse of the GDR the region changed once more, and yet again it was a dramatic transformation. Civic protest against the environmental degradation grew and attained voice in the huge mass movements of November 1989 in Leipzig (particularly concerning clean air, but also: "Stasi in den Tagebau"; that means: "Stasi (the secret service of the GDR) to the opencast mines"). But future developments were not shaped by these civic movements but by actors with more political and economic power, some of them having national influence and others spreading out to gain a global reach. In a few years the industry of the GDR collapsed. What happened was a tremendous transformation which at first sight led to really wonderful consequences: In the space of only 15 years, once devastated, crater-crusted landscapes were transformed into pleasant recreation areas and in some cases, they even became nature reserves. Whereas the pre- 1989 "Südraum Leipzig" was a synonym for environmental degradation and perceived to be a health risk, by the end of the century the idea arose to create one of the largest lake districts in Germany with up to 40 new lakes, some of them among the biggest in Germany (Linke 2002).

But up until now we have only scrubbed the surface. The remediation and revitalisation process is not yet complete and it represents more a partial vision than a concrete reality. Moreover, a lot of complex, interwoven natural and socio-economic processes raise concerns as to whether the environmental problems of this region could be (or have been) tackled. At the beginning of 1990 there was profound uncertainty with regard to what would happen. The Leipzig-Halle region represents the biggest environmental challenge of reunified Germany or even one of the biggest of all of Europe. Even today, after a lot of work some real challenges still remain. The following points offer a summary of the most important processes, beginning with the most positive ones:

- the environmental conditions improved rapidly: in particular air and water quality, among others;

- nearly all open-cast mining sites were abandoned (in the „Südraum" only one site remains in operation, with the entire region hosting only three presently functional mines), and areas that had been scheduled to be transformed into mining sites have not undergone such a process and remain intact, more or less unchanged;

- this was possible because nearly all technically-outdated power plants and factories were closed (only one new power plant was built, equipped with new technologies and supplied by only two open-cast mines);

- consequently, a huge amount of jobs were lost (decreasing from 60 000 jobs in lignite mining in 1989 to only 3000 in late 2000; see Linke 2002), unemployment rates and closely-related social problems increased (in the GDR jobs in the mining and chemical industry were both well regarded and well remunerated);

- whereas in the past the region had received immigrants, in the 1990's emigration increased;

- as a result of this demographic change, most cities in eastern Germany, as was the case in more and more cities in other regions, became "shrinking cities", representing new challenges for urban governance (Kabisch et al. 2004);

- the structural change from an industrial to a "post-industrial" area – whatever this may mean – brought about a fresh inclination and need for new economic enterprises and income opportunities;

- with respect to the natural conditions, a lot of questions remain unresolved, especially regarding some of the more technical aspects (groundwater remediation, river basin and landscape re-cultivation);
- and in particular, regarding the compatibility between scientific-technical solutions, economic efficiency, social desirability and political accountability.

Looking back on this transformation we can identify a lot of important challenges, some of which have been addressed in the interdisciplinary research of the UFZ and other institutes:

- technical problems regarding the flow of water into open-cast sites and how to treat the embankments;
- scientific problems: e.g. regarding quality and level of ground water and the remediation of river basin contamination;
- ecological problems: preservation of rare or endemic successor plants;
- social problems: demographic change (emigration) and the need for a revitalisation of communities in post-mining landscapes;
- economic problems: creating employment opportunities.

Together they come to form a complex challenge for governance processes, particularly concerning the need to integrate different and sometimes opposing needs and interests. Considering this challenge it is important to keep in mind that we cannot go back to the "Gestalt" of the landscapes before becoming industrially transformed: a huge amount of coal was exploited and a huge amount of earth was moved, making it impossible to completely restore the landscape to its original state. Therefore, it is necessary to *shape a new landscape*. Nevertheless, there exits some real challenges for governance processes:

- Regarding the compatibility of nature protection and social desires, particularly those of the local residents, there are good scientific reasons to abandon parts of the landscape to natural succession as protected areas (Altmoos and Durka 1997); but for the revitalisation of the communities of the Leipzig-Halle region, employment opportunities and recreation areas are also important. Both aspects - employment and recreation - are connected with the search for regional tourism. However, attaining a harmonious balance between nature protection, tourism development and community opportunities

is by no means an easy task, due to the fact that supposed employment benefits deriving from tourism have often been overestimated (Linke 2002).

- Regarding science in political decision making there remains some uncertainty concerning the flow of water through open-cast sites and how to treat embankments or re-flooded mines, which makes further research necessary. In particular, the return of previously removed groundwater remains a real challenge and more than 50 years are needed until the re-flooding process is completed. Decision makers and the public, however, often demand quicker solutions. One significant challenge is that nobody knows exactly what kind of toxic material is contained in the soils – and what will we happen if these contaminated sites are flooded. Sometimes, such problems have been exacerbated by natural disasters as occurred in a huge flood in 2002, where one major strip mine was flooded, literally overnight.

- The process is far from being completed. Indeed, due to natural (e.g. groundwater availability) as well as financial limitations, the process will be delayed for decades to come. On the one hand, every single side raised special concerns with regard to specific natural conditions (Linke 2002, 16). On the other hand, landscape re-cultivation is embedded in a broader process of regional structural change that has a dynamic of its own which is strongly connected to broader national and global processes. At the centre of this dynamic are economic processes, which are at least global in scale, and socially connected problems like emigration.

- Therefore, the governance process of reshaping the Leipzig-Halle regional landscape, in all it complex entirety, has not really been controlled by the local and regional authorities and only to some degree by national or supranational governments. The re-cultivation of the "Südraum" and the whole region has been very expensive and there still exists considerable pressure for further funds from the federal government and the EU (estimated at between 14 to 16 Billion Euro, Linke 2002) in order to finish the project. Moreover, socioeconomic development strategies have tried to attract foreign capital, representing another aspect of what Mitchell (2001) call the "lure of the local". The only power plant and the last remaining open-cast site in the „Südraum" today are owned by a US-based company. Consequently, regional change has come to be immersed within a wider process of global economic change which encompasses an increase in a specific form of spatial integration which also leads to new dependencies.

To sum up, the „Südraum" region displays many challenges some of which correspond to the experiences of other regions: the need to deal with tensions between ecology and economy; to resolve conflicts between scientific perceptions and the needs of decision makers, the local residents and the wider public, including social movements and the media, to mention only a few. However, more than in other cases, the pure size, the complexity and the strong inter-linkages between different dimensions and different ecological and social scales raises new challenges and a need for the enhancement and development of further conceptual efforts. In particular, more than in other regions a conservative approach becomes discredited: to preserve the "Gestalt" of the landscapes before becoming industrially transformed is simply impossible. Therefore, a multi-level governance approach has to pay attention to the wider societal dynamics connected with the interplay of different levels of decision making while at the same time being sensitive to the natural conditions of the concrete landscapes. Big societal transformations like the end of the Cold War and the collapse of the GDR, European integration and neoliberal globalisation are as important as groundwater problems and air quality with regard to their impact on the „Südraum". What more, the end of GDR is an important aspect of the re-scaling of statehood. For a long time most of the issues involved seemed to lie, indisputably, under the responsibility of the national government of the former GDR. But, in the 1990's the task shifted to supranational institutions such as the EU, falling within its environmental measures and coming to depend on its financial support at the same time as the regional and local levels became more important in terms of attracting capital and dealing with concrete environmental problems. Thus, Landscape governance has to go beyond a narrow-steering perspective where its focus is directed primarily on technical aspects. Instead, there needs to be an integration of the broader (regional) societal dynamics with those dynamics coming to comprise a global scale of world society while also ensuring that the environmental conditions of the concrete place are not overlooked.

5. Conclusion

The example of the „Südraum Leipzig" could offer an illustration of the many issues with which landscape governance must deal with. This example elicits a very complex societal dynamic – including the rescaling of socio-economic and political processes – and a large diversity of public and private actors. Furthermore, questions are being raised regarding inter-disciplinary research and the role of science in decision-making. Of central significance here

is the fact that the required interdisciplinary co-operation comprises the engagement of various social as well as natural sciences. Economic, socio-cultural and political-juridical issues are as pertinent as the integration of natural-science knowledge within a broad spectrum of different partial-disciplines, from Biology to Hydrology to Pedology. Moreover, landscape governance goes beyond political steering only from *above*. Rather, it moves towards a shaping of social and ecological relationships from a perspective which is situated neither "above" nor "outside" the realm of problems. The social and institutional context and the variety of social interests cannot be ignored, nor can one assume that the natural sciences, technological knowledge, and socio-economic instruments can offer easy solutions for the problems at hand. The problems of scientific uncertainty and action under insecurity are most readily presented in the context of governance processes. Complex learning processes and attempts to promote broader public discussions are just as necessary as deep communication between social and natural scientists. It is also important to mention that landscape governance must generate and make reference to the concrete conditions of the respective place in a manner in which local knowledge is given space and accorded at least some importance.

In other words, Landscape governance demands intensive inter- and transdisciplinary co-operation. It is also closely related to a problem-oriented kind of research which requires awareness in relation to the problem at hand as well as to the process of political shaping. Governance, in this respect, does not only mean that we cannot expect a solution from an omnipotent state. When we come to perceive science as itself belonging to the circle of actors involved in governance processes, then both social and natural scientists are made to reflect on their own roles in political decision-making. This does not mean that the separation between state/politics, science and other sub-areas or actors would completely disappear. But, scientists must escape their fear of losing credibility when engaging in political decision-making processes (Lach et al. 2003). Moreover, landscape governance represents an approach for the handling of complex, locally-anchored problems. Therefore, local experiences with concrete locations can also play an important role. As Fischer (2000) has shown, non-experts and local knowledge can by all means be permitted to offer a special contribution to problem processing. This is especially true if we assume that problems contain, in equal measure, dimensions of cultural evaluation and socio-economic conflicts of interest as well as giving evidence of a reference to special socio-cultural contexts and to local ecological conditions, and this is, without a doubt, the case with regards to landscape governance. Problem-orientated and application-referenced research in the context of landscape governance cannot be reduced

to conventional policy-advice (even though, of course, this can always represent an option). Rather, it must contribute itself to societal shaping in the interplay between social and physical factors.

Landscape governance, therefore, represents not only a special application case for general governance approaches. Because it is concerned with a complex reconfiguration of politics, with multi-level decision-making and the transformation of statehood as well as with environmental problems at concrete regions and at particular places, it can also establish new accents within governance approaches in general and stimulate new kinds of research.

References:

Adorno, T.W., 1970. Ästhetische Theorie. Frankfurt/Main, Suhrkamp.

Altmoos, M. and M. Durka 1997. Naturschutz in der Bergbaufolgelandschaft als Teil einer nachhaltigen Landschaftsentwicklung. In: Ring, I., (Ed.). Nachhaltige Entwicklung in Industrie- und Bergbauregionen- Eine Chance für den Südraum Leipzig? Leipzig-Stuttgart, B.G. Teubner Verlagsgesellschaft, 52- 73.

Antrop, M. 2005. Why landscape of the past are important for the future. Landscape and urban planning 70, 21-34

Antrop, M. 2006. Sustainable landscapes: contradiction, fiction or utopia? Landscape and Urban Planning 75(3-4), 187-197.

Bache, I. and M. Flinders, (Eds.) 2004. Multi-Level Governance. Oxford & New York, Oxford University Press.

Benz, A. 2004. Einleitung: Governance: Modebegriff oder nützliches sozialwissenschaftliches Konzept? In: Benz, A. (Ed.). Governance: Regieren in komplexen Regelsystemen. Wiesbaden, VS - Verlag für Sozialwissenschaften., 11-28.

Berkner, A. 2004. Wiedernutzbarmachung im Braunkohlebergbau und forschungsseitige Grundlagen- eine Standortbestimmung aus der Sicht der Planungspraxis. In: Gläßer, C., (Ed.). Nachhaltige Entwicklung von Folgelandschaften des Braunkohlebergbaus. Zeitschrift für angewandte Umweltforschung. Berlin, Analytica Verlag. Sonderheft 14, 217-227.

Bischoff, U., Kabisch, S., Linke, S., Ring, I. and D. Rink 1995. Soziale Brüche und ökologische Konflikte in einer ländlichen Industrieregion: Südraum Leipzig. UFZ- Bericht Nr.2/1995. Leipzig, Umweltforschungszentrum Leipzig- Halle.

Brand, U. 2005. Die politische Form der Globalisierung. Politische Institutionen und soziale Kräfte im internationalisierten Staat. Unpublished second thesis („Habilitationsschrift"), Department of Social Sciences at Kassel University, November 2005.

Brand, U. and C. Görg 2003. The State and the Regulation of Biodiversity. International Biopolitics and the Case of Mexico. Geoforum 34, 221-233.

Brand, U., Görg, C., Hirsch, J. and M. Wissen 2007. Contested Terrains, Routledges Series in International Political Economy (in preparation).

Braun, B. and N. Castree (Eds.) 1998. Remaking reality: nature at the millenium. New York, Routledge.

Brenner, N. 2001. The limits to scale? Methodological reflections on scalar structuration. Progress in Human Geography 25, 591-614.

Brenner, N., 2004. New state spaces. Oxford, New York, Oxford University Press.

Brenner, N., Jessop, B. and M. Jones 2003. Introduction: State space in question. In: N. Brenner, N et al. (Eds.), State / Space: A Reader. Malden, Oxford, Berlin, Blackwell Publishers, 1-26.

Brown, C. and M. Purcell 2005. There's nothing about scale: political ecology, the local trap, and the politics of development in the Brazilian Amazon. Geoforum 36, 607-624.

Bulkeley, H. 2005. Reconfiguring environmental governance: Towards a politics of scales and networks. Political Geography 24, 875-902.

Cash, D.W., Adger, W.N., Berkes, F., Garden, P., Lebel, L., Olsson, P., Pritchard, L. and O. Young 2006. Scale and cross-scale dynamics: governance and information in s multilevel world. Ecology and Society 11(2), 8 (online available).

Castree, N. 2003. Environmental issues: relational ontologies and hybrid politics. Progress in Human Geography 27(2), 203-211.

Desfor, G.L. and R. Keil 2004. Nature and the city. Tucson, The University of Arizona Press.

Drechsler, M., Grimm, V. and J. Myšiak 2005. Differences and similarities between ecological and economic models for biodiversity conservation. UFZ-Discussion Papers. Leipzig, Halle, UFZ Centre for Environmental Research GmbH.

Durant, R.F., Fiorino, D.J. and R. O'Leary (Eds.) 2004. Environmental governance reconsidered. Cambridge, London, MIT Press.

Fischer, F. 2000. Citizens, experts, and the environment: The politics of local knowledge. 3. Aufl. Durham, London, Duke University Press.

Forman, R.T.T. and M. Godron 1986. Landscape ecology. New York, John Wiley & Sons.

GLP 2005. Global Land Project. Science Plan and Implementation Strategy. IGBP Report No. 53/IHDP Report No. 19, IGBP secretariat, Stockholm.

Goldman, M. (Ed.) 1998. Privatizing Nature. Political struggles for the global commons. London, Pluto Press.

Görg, C. 2003. Regulation der Naturverhältnisse. Zu einer kritischen Theorie der ökologischen Krise. Münster, Westfälisches Dampfboot.

Görg, C. 2005. Raum und Gesellschaft: Zur Bedeutung von Ort und Raum in Zeiten der "Globalisierung". In: Weingarten, M. (Ed.). Strukturierung von Raum und Landschaft. Münster, Westfälisches Dampfboot, 222-239.

Görg, C. and U. Brand 2006. Global Regulation of Genetic Resources and the Internationalization of the State. Global Environmental Politics 6(2), 2006 (in press).

Haase, G. 1991. Theoretisch-methodologische Schlussfolgerungen zur Landschaftsforschung. Nova acta Leopoldina 64 (276), 173-186.

Haber, W. 1990. Basic concepts of landscape ecology and their application in land management. Physiological Ecology Japan 27, 131-146.

Hard, G. 2001. Der Begriff Landschaft: Mythos, Geschichte, Bedeutung. In: Konold, W., Böcker, R., Hampicke, U. (Eds.). Handbuch Naturschutz und Landschaftspflege. Vol. 6, Landsberg, ecomed, 1-15.

Held, D. and A. McGrew 2002. Governing Globalization. Power, Authority and Global Governance. Cambridge, Malden, Polity.

Hirsch, J. 1998. Vom Sicherheitsstaat zum nationalen Wettbewerbsstaat. Berlin, ID-Verlag.

Hirsch, J. 2002. Herrschaft, Hegemonie und politische Alternativen. Hamburg, VSA.

Hoskin, W.G. 1955. The Making of the English Landscape. London, Penguin.

Humboldt, A.v. 2004 [1845]. Kosmos: Entwurf einer physischen Weltanschauung. Frankfurt/Main, Eichborn-Verlag.

Jessop, B. 2002a. The future of the capitalist state. Cambridge, Polity Press.

Jessop, B., 2002b. Governance and metagovernance: On reflexivity, requisite variety, and requisite irony. In: Heinelt, H., Getimis, P., Kafkalas, G. et al.(Eds.). Participatory governance in multi-level context. Opladen, Leske+Budrich., 33-58.

Kabisch, S., Bernt, M. and A. Peter 2004. Stadtumbau unter Schrumpfungsbedingungen: Eine sozialwissenschaftliche Fallstudie. Wiesbaden, VS - Verlag für Sozialwissenschaften.

Kanie, N. and P. M. Haas (Eds.) 2004. Emerging forces in environmental governance. New York, United Nations University Press.

Kaufmann, S. 2005. Soziologie der Landschaft. Zürich, VS Verlag.

Keil, R. 1998. Globalization makes states: Perspectives on local governance in the age of the world city. Review of International Political Economy 5(4), 616-646.

Kemper, F.-J. 2003. Landschaften, Texte, soziale Proaktiken - Wege der angelsächsichen Kulturgeographie. Petermanns Geographische Mitteilungen 147(2), 6-15.

Kooiman, J. 2000. Societal governance: Levels, modes, and orders of social-political interactions. In: Pierre, J. (Ed.), 138-164.

Kowarik, I. 2005. Wild urban woodlands: Towards a conceptual framework. In: Kowarik, I., Körner, S. (Eds.). Wild urban woodlands. Berlin, Heidelberg, Springer Verlag, 1-32.

Lach, D., List, P., Steel, B. and B. Shindler 2003. Advocacy and Credibility of Ecological Scientist in Resource Decisionmaking: a regional study. BioScience 53(2), 170-178.

Linke, S. 2002. Lebensqualität in der Bergbaufolgelandschaft - Nutzungspräferenzen an Bergbaurestseen. UFZ- Bericht Nr. 15/2002. Leipzig, Umweltforschungszentrum Leipzig- Halle.

MA 2003. Ecosystems and Human Well-Being: A Framework for Assessment. Washington D.C., Island Press.

MA 2005. Millennium Ecosystem Assessment synthesis report. Washington DC, Island Press.

Magnusson, W. and K. Shaw 2003. A political space. Minneapolis, University of Minnesota Press.

Marx, K. and F. Engels 1980 [1948]. Manifest der kommunistischen Partei. In: dies., Werke Bd. 4, Berlin, Dietz.

McCarthy, J. 2005. Scale, Svereignty, and Strategy in Environmental Governance. Antipode 37(4), 731-753.

Meadowcroft, J. 2002. Politics and scale: some implications for environmental governance. Landscape and urban planning 61, 169- 179.

Mitchell, D. 2001. The lure of the local: landscape studies at the end of a troubled centrury. Progress in Human Geography 25(2), 269-281.

Naveh, Z., 1995. Interactions of landscapes and cultures. Landscape and Urban Planning 32, 43-54.

Pierre, J., 2000. Introduction: Understanding governance. In: Pierre J. (Ed.). Debating governance. Oxford, New York, Oxford University Press, 1-10.

Pierre, J. and B.G. Peters 2000. Governance, politics and the state. Houndsmill, London, Macmillan Press.

Potschin, M. and R. Haines-Young 2006. "Rio+10", sustainability science and Landscape Ecology. Landscape and Urban Planning 75(3-4), 167-174.

Pütz, M. 2004. Regional Governance. München, Oekom.

Rosenau, J. 2004. Strong demand, huge supply: governance in an emerging epoch. In: Bache and Flinders (Eds.). 31-48.

Rosenau, J., Czempiel, E.O. (Eds.) 1992. Governance without government: Order and change in world politics. Cambridge, Cambridge University Press.

Rothman, D. S. and J. Rothman (Eds.) 2003. Scaling in integrated assessment. Lisse, Abingdon, Exton, Tokyo, Swets & Zeitlinger.

Sassen, S. 1994. Cities in world economy. Thousand Oaks, Pine Forge Press.

Schmid, C. 2003. Raum und Regulation. In: Brand, U., Raza, W. (Eds.). Fit für den Postfordismus? Münster, Westfälisches Dampfboot, 217-242.

Simmel, G. 1993 [1913]. Philosophie der Landschaft. In: ders., Das Individuum und die Freiheit, Frankfurt/Main, Fischer, 130–139.

Swyngedouw, E. 1997. Neither global nor local: "Globalization" and the politics of scale. In: Cox, K.R. (Ed.). Spaces of globalization. New York, London, Guilford Press, 137-166.

Trepl, L. 1995. Die Landschaft und die Wissenschaft. In: Erdmann, K.-H., Kastenholz, H.G. (Eds.). Umwelt- und Naturschutz am Ende des 20. Jahrhunderts. Berlin, Heidelberg, Springer Verlag, 11-26.

Trepl, L. 1997. Ökologie als konservative Naturwissenschaft: Von der schönen Landschaft zum funktionierenden Ökosystem. Geographisches Denken. Urbs et regio 65, 467-492.

Tress, B. and G. Tress 2001. Begriff, Theorie und System der Landschaft: Ein transdisziplinärer Ansatz zur Landschaftsforschung. Naturschutz und Landschaftsforschung 33 (2/3), 52-58.

Wascher, D.M. (Ed.) 2000. Proceedings of European Workshop on Landscape Assessment as a Policy Tool. Eiropean Centre for Nature Coservation and The Countryside Agency, Tilburg, Cheltenham.

Whatmore, S. 2002. Hybrid Geographies. London, Sage.

Willke, H., 1983. Entzauberung des Staates. Frankfurt/Main, Athenäum.

Young, J., Baldi, A., Benedetti-Cecchi, L., Bergamimi, A. et al. 2005. Landscape scale biodiversity assessment: The problem of scaling. Report of an electronic conference. Vacratot, Hungary, Institute of Ecology and Botany of the Hungarian Academy of Sciences.

Young, O. R. (Ed.) 1997. Global Governance. Drawing Insights from Environmental Experience. Cambridge/Mass., MIT Press.

Young, O.R. 2002. The institutional dimensions of environmental change: Fit, interplay, scale. Cambridge, MIT Press.

Young, O. 2006. Vertical inerplay among scale dependent environmental and resource regimes. Ecology and Society 11(1), 27 (online available).

Zürn, M., 1998. Regieren jenseits des Nationalstaates: Globalisierung und Denationalisierung als Chance. Frankfurt/Main, Suhrkamp.