

# Regional Structural Change and Resilience

## From Lignite Mining to Tourism in the Lusatian Lakeland

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**Abstract** The terms “resilience” and “vulnerability” have both acquired prominence in recent academic and political debate. Originating in the natural sciences, they have meanwhile established themselves not only in the social sciences, but also—and more recently—in the areas of economic geography, as well as urban and regional development. Nevertheless, as is the case with many of the issues adopted from the natural sciences, the social sciences have had to struggle to fully capture and conceptualise the theoretical meaning of the terms. The present article will explore the added-value and limits of using the notions of resilience and vulnerability in relation to structural change in old industrial regions. It will also draw on empirical information from a qualitative case study of Lusatian Lakeland, a former lignite mining region in Eastern Germany that is currently being turned into a tourist destination. Research focuses on analysing the sectoral and regional cooperation between various actors in the region. The introduction of the terms resilience and vulnerability in this case study raises some interesting questions about the nature and interpretation of regional development processes that are characterised by a high degree of uncertainty and severe structural change. The research results also highlight the conceptual difficulties these terms present, particularly in the context of structural transformation.

**Keywords** Post-mining landscapes · Transformation · Adaptability · Old industrial regions · Policy coordination

### Regionaler Strukturwandel und Resilienz

Vom Braunkohlebergbau zum Tourismus im Lausitzer Seenland

**Zusammenfassung** Die Begriffe „Resilienz“ und „Vulnerabilität“ haben eine große Bedeutung in der gegenwärtigen wissenschaftlichen und politischen Diskussion erlangt. Ausgehend von den Naturwissenschaften wurde das Begriffspaar in die Sozialwissenschaften übertragen – zuletzt auch in die Wirtschaftsgeographie sowie die Stadt- und Regionalentwicklung. Dabei ist dieser Transfer, wie oft bei naturwissenschaftlichen Begriffen, von konzeptionellen und theoretischen Unklarheiten gekennzeichnet. Der vorliegende Beitrag beschäftigt sich daher mit den Möglichkeiten und Grenzen der Nutzung der Begriffe im Kontext des Strukturwandels in altindustriellen Regionen. Die empirische Grundlage bildet eine qualitative Fallstudie des Lausitzer Seenlandes, ein ehemaliges ostdeutsches Braunkohlerevier, welches nun zu einer Tourismusregion umgestaltet wird. Dabei spielt die Analyse der sektoralen und regionalen Kooperationen von verschiedenen Akteuren der Region eine besondere Rolle. Bei der Anwendung der Begriffe „Resilienz“ und „Vulnerabilität“ auf dieses Fallbeispiel stellen sich einige interessante Fragen bezüglich der Merkmale und Interpretation von Regionalentwicklung unter der Bedingung von Unsicherheit und starkem Strukturwandel. Daneben zeigt die Forschung auch die konzeptionellen Schwierigkeiten der Begriffe, besonders im Kontext tiefgreifender struktureller Transformationen.

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**Schlüsselwörter** Bergbaufolgelandschaften · Transformation · Anpassungsfähigkeit · Altindustrieregionen · Politikkoordination

## 1 Introduction

In recent academic and political debate, great importance has been attached to the terms “resilience” and “vulnerability”. Although the original concepts behind these terms derive from the field of ecology (Holling 1973; Folke/Carpenter/Elmqvist et al. 2002: 4), they have been incorporated into various strands of social science during the past decade. For some authors, this heightened interest indicates a “response to a generalised, contemporary sense of uncertainty and insecurity and a search to find formulas for adaptation and survival” (Christopherson/Michie/Tyler 2010: 3). A more general explanation is offered by Pendall, Foster and Cowell (2010: 72) where these terms are currently regarded as a “trendy” development in academic debate. Other authors view resilience as an essential precondition for sustainable development (Folke/Carpenter/Elmqvist et al. 2002: 23 f.).

The terminology, which originated in the natural sciences, has meanwhile also gained acceptance in the social sciences, e.g. at the level of human-environment-relations with regard to natural hazards and disaster prevention. Other concepts used in this context include risk management, climate change, and risk prevention in general (Schanze 2007; Hutter 2011). More recently, the terminology has also been integrated into other fields of social science such as economic geography (Simmie/Martin 2010), urban and regional planning (Christopherson/Michie/Tyler 2010; Müller 2011), and regional development (Lukesch/Payer/Winkler-Rieder 2010; Pike/Dawley/Tomaney 2010).

The terminology is often applied to urban centres and regions facing severe economic crises. On the whole, these regions are very much at risk, in other words: they are particularly vulnerable to overall economic developments, such as growing international competition. Entire sectors, including mining, ship construction, and the steel and textiles industries are going bankrupt or being cut back in size, even though there is nothing to take their place. Hence, it is very important to ask how and whether these regions can cope with structural change and find a way of becoming economically powerful again—in the sense implied in the term resilience.

Against this background, the present paper seeks to show how the subject of regional economic structural change and endeavours to cope with this process relate to new terms such as “resilience” and “vulnerability”, as well as to “adaptation” and “adaptability”. It proceeds, therefore, from theoretical considerations and a qualitative case study

of *Lusatian Lakeland* (Germany). This region is characterised by extreme structural change, which started with the closure of most of the lignite opencast mines shortly after the political transformation of the East German system in 1990. One way of adapting to economic decline involved, at the time, co-ordinating the large-scale rehabilitation of the mines with other endeavours that were aimed at developing the economy. In this way, a lakeland was created with the goal of establishing a basis for supra-regional tourism.

Chapter 2 introduces the conceptual foundations of the present contribution. It begins by discussing the concepts of resilience, vulnerability and regional structural change. This debate is followed by a deeper theoretical analysis of sectoral and regional co-ordination policies. Chapter 3 is devoted to a presentation of the case study and is followed, in Chap. 4, by a discussion of the study. The paper ends with a conclusion.

## 2 The Conceptual Foundations

### 2.1 Resilience, Vulnerability and Regional Structural Change

The concepts of resilience and vulnerability are complex and defined in very different ways, as Müller (2011), for instance, demonstrates. It will not be possible to comprehensively examine once again the wide range of concepts discussed in the literature. Instead, they will be defined in relation to the aims of this contribution. In the process, various conceptual ideas employed in the literature will also be elucidated. A suitable approach to defining resilience from the standpoint of urban and regional development can be found in Simmie and Martin (2010: 28), who note that: “Most uses of the term in regional and urban applications refer to this idea of the ability of a local socio-economic system to recover from a shock or disruption”.

Carpenter/Walker/Anderies et al. (2001: 767) remind us that it is essential to define precisely what is to be termed resilient—and in relation to which context. If the question “resilience of what?” is posed, a fundamental problem arises (see also Simmie/Martin 2010 and Pike/Dawley/Tomaney 2010). In his much-cited essay, the ecologist Holling defines resilience as a “measure of the persistence of systems and of their ability to absorb change and disturbance and still maintain the same relationships between populations and state variables” (Holling 1973: 14).<sup>1</sup> The structure and func-

<sup>1</sup> Holling’s contribution contains surprises, because it addresses issues that are not taken up in this fashion in the more general, current discussion and are rather difficult to transfer to regional development. Holling defines resilience as contrasting with stability. Whereas stability involves relatively minor fluctuations, e.g. in a population, resilience primarily concerns a system’s ability to survive (persistence). Hence,

tion of the system remains unchanged. If an ecosystem is not resilient to shock, the system will be subject to irreversible change (Holling 1973: 7), causing a transformation to take place. This approach also provides a basis for German ecological-landscape research (as in the case of Bastian/Schreiber 1999: 41 f.).

It is quite obvious, however, that a concept of resilience geared to the constancy of structures and functions is hardly suitable for conducting research into processes of structural change. The processes taking place—or supposed to be taking place—in old industrial areas are better referred to as transformations (cf. Hudson 2010: 13). Ultimately, the regions affected can no longer fall back on the old structures and functions—or on their old character. The use of the term resilience in the context of the momentous and difficult structural changes facing towns and regions is, therefore, only meaningful if we conceptually desist from preserving the old structures and functions once disruption has been caused. The authors of this contribution are, therefore, more in favour of adopting a quantitative and structurally neutral concept of resilience, which has evidently established itself in the pertinent literature. In response to the question “resilience of what”, it is useful here to start by proceeding from the central dependent variables used by politicians and planners, such as employment and population levels (the approach also adopted by Lukesch/Payer/Winkler-Rieder 2010).

In response to the question “resilience to what”, a specific brief or long-term event—a so-called shock—must be concretely named that has (or has had) an influence on the situation. The degree of resilience of the region under observation considered in relation to a specific shock can be defined in terms of the way in which the aforementioned dependent variables have behaved during a certain period vis-à-vis the initial values (cf. Pike/Dawley/Tomaney 2010: 61; Simmie/Martin 2010: 28 f.). If the old values, such as the unemployment rate and the population size, reappear, one can say that there is complete resilience.

So far, discussion has focused on shocks that have already occurred: on their impact and on dealing with them over a certain time period. Once a shock has occurred, however, it is not only important that towns and regions—if they are to develop—return to the old levels of employment and population: From a qualitative point of view, it is also important to pay attention to the risks that such a development entails, as happens when setbacks are suffered in the wake of a potentially new shock.

The concept of vulnerability comes into play, at the latest, with a concept of resilience, which is related to a specific point in time in the future. How sensitive is the region

vis-à-vis more general, problematic developments? From the standpoint of regional economics, vulnerability is sometimes understood merely as the degree to which enterprises and branches are represented in a region whose development is jeopardised by changing overall conditions: such as the intensification of international economic competition and the overall development of energy costs (see Lintz/Müller/Finka 2005). Analogously to the literature of climate adaptation (see Birkmann/Böhm/Buchholz et al. 2011), the concept of vulnerability can be extended to include the capacity of the private sector and politicians to adapt to the changing and changed overall conditions and to thereby reduce the overall damage.

If the region succeeds in returning to the initial employment and population figures, it can—from an economic standpoint and in relation to the past—be referred to as resilient in the sense mentioned above. The path of development taken may, however, heighten or diminish a region’s vulnerability to new shocks. *Greater* vulnerability results from a higher degree of economic specialisation and/or the preservation of old sectoral structures, for instance, which are accompanied by the “ossification” of regional control structures. Incidentally, for a case such as this—considered from the standpoint of vulnerability—Pike/Dawley/Tomaney (2010: 62), citing Grabher/Stark (1997) employ, in a very specific manner, the concept of “adaptation”. In the process, they point out that a region may (in response to a certain shock, and in relation to certain benchmark variables) prove to be resilient, yet, at the same time, lose its resilience to potential shocks in the future. Conversely, an adjustment path—proactive or random—can also *diminish* vulnerability, as in the case of a greater diversification of economic activities and/or more dynamic and open co-operation between the economic and political actors.

In principle, a certain degree of resilience to potential shocks can be identified for any region at any time. This is because, at any point in time, a certain potential shock may arise in response to dangers, whilst there may be a certain degree of “adaptability”, too (cf. Simmie/Martin 2010: 33). The latter has hitherto been discussed in rather general terms in relation to the concept of innovativeness, although terms such as “learning region”, innovative milieus and networks also play a role here.

A distinction must now be made regarding the concept of “adaptability”: does it refer to an ability to return quickly to an old, but fragile level of employment and unstable population size, or to arriving (in the long-term) at a state that is generally far more stable and secure? Pike, Dawley and Tomaney adopt a firm stance here and compare the narrowly defined concept of adaptation with their specific term “adaptability”, which is associated with a decline in vulnerability. They define “adaptability” as “the dynamic capacity to effect and to unfold multiple evolutionary tra-

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systems with a high degree of stability may well display little resilience (Holling 1973: 14 f.).

jectories, through loose and weak couplings between social agents in place, that enhance the overall responsiveness of the system to unforeseen changes” (Pike/Dawley/Tomaney 2010: 62). In the following, then, the term “adaptability” stands, above all, for the capacity to pursue novel courses in a given region. In this case, however, a greater number of determining factors of this magnitude are identified than just network-like “loose and weak couplings” (see Lintz/Müller/Finka 2005: 9 ff.; Lukesch/Payer/Winkler-Rieder 2010: 52 ff.).

In the economic sphere, it is essential to mention not only the quality of regional management and entrepreneurs and the regional framework conditions, but also, for example, the supply of skilled labour and infrastructures, the attractiveness of the natural environment, and a milieu conducive to innovation. As these factors are greatly influenced by public policies, the qualities of governments—which include leadership, readiness for change and experience—and the coordinative interplay of public and economic actors play a crucial role here (see also Pike/Dawley/Tomaney 2010: 68). Hudson (2010: 12 f.) draws attention to the role of social learning.

In this study, which takes up the thematic connection between the rehabilitation of lignite mining and the development of tourism in the example of *Lusatian Lakeland*, the effects of a shock have focused attention on sectoral co-ordination in the regional governance system.<sup>2</sup> Generally speaking, however, the following three questions, which are relevant to empirical reflection, may be derived from the above-mentioned theoretical considerations:

- Has the *Lusatian Lakeland* region, viewed from the perspective of the year 2010, proven to be resilient in view of the employment and population figures, and with regard to the shock of 1989–1990?
- From the standpoint of governance, how has the region adapted to the new situation? How have the rehabilitation of the lignite mines and the development of tourism been linked and co-ordinated with one another?
- Is the region as a whole now more resilient to possible future shocks—in terms of diminished vulnerability and greater adaptability—than it was in 1990?

## 2.2 Sectoral and Regional Political Co-Ordination

In multi-level political-administrative systems with a number of different levels and areas of policy-making, the co-ordination of actors who have the potential to influence one another negatively and positively is a decisive element in a successful overall political strategy. Of paramount interest in the present contribution is the way in which

regional actors operating in sectoral policy areas (in this case: rehabilitating the mines and developing the economy) respond to an economic shock (in this case: the closure of opencast mines and related industries) synergetically and in a co-ordinated manner over a long period of time, and in a manner that has maximum positive political impact on the region (here: on the development of tourism as an additional economic pillar).

The present analytical framework employs Mayntz and Scharpf’s “actor-centred institutionalism” (ACI, see: Scharpf 1997) as a basis for establishing a common thread between the literature in the various areas. Actor-centred institutionalism regards the (in this case: co-ordinated) political content as being determined by actors who are trying to assert their interests within an institutional framework. In this context, owing to the typical governance settings in regions with a great number of relatively independent actors, the focus is on co-operative self-determination.

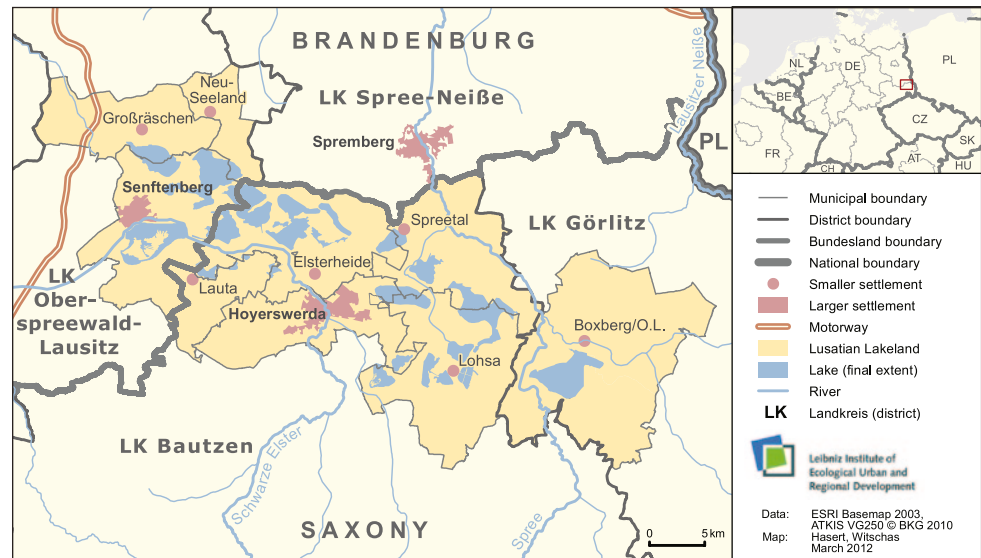
In the case of *Lusatian Lakeland*, co-ordination between the actors has both a sectoral and a regional dimension. Viewed from a sectoral perspective, it involves co-ordinating the environmental rehabilitation of the closed opencast mines, on the one hand, and developing the economy, on the other. In this context, the analytical framework is supplemented by literature dealing with co-ordination and, above all, on the subject of environmental policy integration (e.g. Nilsson 2005; Jordan/Lenschow 2008). The regional dimension of policy co-ordination takes shape through the focus on a certain area. This primarily assumes the form of co-operation between neighbouring municipalities, the federal *Länder*, the federal government and private actors, with the sectoral competences being distributed in different ways among the various political levels. In addition to inter-communal co-operation, there are the sectoral co-ordination processes, which take place both within and across a number of different political levels. Here, the analytical framework is supplemented, above all, by concepts of inter-communal co-operation and “regional governance” (e.g. Fürst 2003; Feiock 2007).

At the sectoral and the regional levels, and in a governance situation that is characterised by negotiations, co-ordination and/or co-operation are dependent on the goals and costs of co-ordinated activities as perceived by the actors. Generally speaking, in the absence of conflict between the actors—combined with the advantages of co-operation—on the one hand, and low negotiation costs, on the other, the most likely scenario will be the emergence of a common political will to implement good, jointly developed solutions (see Scharpf 1997: 130). For the actors, among whom individual personalities often play a role, two aspects are paramount:

<sup>2</sup> This aspect will be dealt with in greater depth in Chap. 2.2.



**Fig. 1** *Lusatian Lakeland* with its rural districts and municipalities



- Being endowed with resources: e.g. staff and financial clout (Scharpf 1997: 51). The actors play an important role by asserting themselves and in their capacity to find solutions to problems.
- Cognitive orientations and values (Scharpf 1997: 62 ff. and 84 ff.): Whereas the former cover initial appraisals of a problem and (co-ordinated) options for taking action, the latter refer not only to goals and interests, but also to basic attitudes towards other actors (e.g. solidarity or rivalry).

As far as the latter is concerned, Nilsson (2005) points to the importance of learning, i.e. learning as a “frame change”. This means not only a growth in knowledge, but also a chance that the goals, interests and attitudes of the actors will change as they interact with one another. The actors operate within an *institutional* framework that defines both obligatory and possible ways of acting. Hence, in a governance situation, in addition to the basic constitutional rules (such as the relationship between the federal state, the *Länder* and the municipalities), the following co-ordination factors must be mentioned, since they can cut co-ordination costs and promote co-ordination in a variety of ways (cf. Jordan/Lenschow 2008):

- Structures: for instance, the fusion of actors and organisational units and the creation of organisational units (such as working groups) established to co-ordinate activities;
- Processes: determining and changing co-ordination processes in collaboration with actors (e.g. information flows, participation, tests).

In the following, the case study will be presented in a way that allows us, during the course of the discussion (Chap. 4), to answer the three empirical questions raised against a

background of theoretical reflections on the concepts of resilience, vulnerability, adaptation and “adaptability”. When it comes to the second question on adaptation responses, the factors of policy co-ordination discussed in this section with regard to the actors and institutions will be taken into account.

### 3 Lusatian Lakeland

Lusatia is a cultural landscape in the East German *Länder* of Saxony and Brandenburg that has been shaped by industrial lignite mining since the 19th century. Its more recent development is closely associated with German unification, the economic shock caused by the latter, the almost total deindustrialisation of the region, a dramatic loss in the importance of lignite as a source of energy, and the ensuing transformation process.

After the “new” *Länder* joined the Federal Republic in 1990, most of the opencast lignite mines, which had formed the backbone of East Germany’s energy sector, were soon shut down. What remained was devastated countryside—full of huge holes and slag heaps—which people could only enter at risk to life and limb (von Bismarck 2004: 12). By switching off the mines’ drainage pumps, thereby causing the ground water to rise again, and by deliberately causing flooding by means of infiltration, a number of lakes arose in succession in the holes created by the mines, completely changing the appearance of the countryside in the process. An example of this is *Lusatian Lakeland* between Senftenberg, Hoyerswerda and Spremberg, which will contain twenty-one lakes with a planned total water surface of approximately 13,000 hectares (see Fig. 1). The declared development goal is to create a water-oriented tourist area

of supra-regional importance that will give the region new economic impulses (cf. Heidenfelder/Schneider 2005).

The following passages describe the process of co-ordinating the rehabilitation of the mines and the development of tourism in *Lusatian Lakeland* from 1990 to 2010. It is based on a qualitative case study carried out by the Leibniz Institute of Ecological Urban and Regional Development, Dresden. The presentation focuses on structural changes, models and visions in the region, as well as on the actors of change and their co-ordination. It is based on comprehensive analyses of the actors and processes (document analyses, media analyses, and thirteen theme-supported qualitative expert interviews). A comprehensive presentation of the results, including a detailed list of sources, shall be prepared elsewhere at a later date.

Four groups of actors can be distinguished in the research area. The Federal Republic of Germany is a central actor in the East German lignite regions, as it finances the greater part of the rehabilitation work and will remain the owner of the areas until it has been discharged from its obligations vis-à-vis the mines. Owing to the need to equalise the ecological living conditions in the old and the new federal states (Article 34 of the Unification Treaty), the following prime rehabilitation targets were set: “protective measures to ensure public safety, the rehabilitation of the devastated areas and the sites of processing plant for their economic and infrastructural use, and the re-establishment of a balanced and largely self-regulating water economy” (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit 1994: 11, own translation). To this end, the Federal Republic founded the *Lausitzer und Mitteldeutsche Bergbau-Verwaltungsgesellschaft* (LMBV: Lausitz and Central-German Mining Administration Company), which, in addition to planning and co-ordinating the rehabilitation measures, also took charge of marketing the rehabilitated areas.

In the federal system of the Federal Republic of Germany, the *Länder* (in this case, Brandenburg and Saxony) enjoy far-reaching political competence, including that of lawmaking, in significant areas of society. Thus, for example, the *Länder* bear a part of the costs of environmental rehabilitation. Infrastructural development, which is extremely important for the former mining region, has been financed largely by the German *Länder*. They also determine the legal framework governing both regional and rehabilitation planning in the lignite regions. The *Land* governments are keen not only to prevent the emergence of “crisis regions”, but also to improve living conditions and gain political acceptance.

For the municipalities in the *Lusatian Lakeland*, the restructuring of the region is an existential question. Since 1990, the main goal has been to create perspectives for the region. The municipalities, being financially weak, are extremely dependent on the federal state and the *Länder*. They are also closely networked with the rural districts,

which have taken on more general tasks such as boosting the economy and marketing tourism. Last but not least, the rural districts and the independently administered towns have created regional planning associations. In their regional plans, they have not only prepared the basic outlines for developing settlements, open spaces and infrastructures, but have also prepared plans for rehabilitating the open-cast mines due for closure.

The fourth group of actors comprises the *private actors*, who are the economic and civil backbone of the region. The heavyweight, with respect to value added and employment, is “Vattenfall Europe GmbH”, which has two coal-fired power stations in the Lakeland. Along with other companies in the manufacturing and services sectors, countless small companies have established themselves in the tourist sector. They are not only addressees of rehabilitation and development policies, but also play a major role in preparing tourist holiday packages.

Proceeding from this characterisation of the key actors, the main features of the rehabilitation and development process shall now be described. Four phases can be distinguished here.

### 3.1 Phase I: Crisis Management (1990–1994)

On 3 October 1990, the former German Democratic Republic was integrated into the Federal Republic of Germany. This move, which had a number of grave political and economic repercussions, affected all regions in East Germany, because it involved the laws of the Federal Republic of Germany being transferred to the new Federal *Länder*. Immediately after unification had taken place, a general election was held in the whole of Germany. Even prior to unification, a start had been made on transforming state enterprises into joint-stock companies.

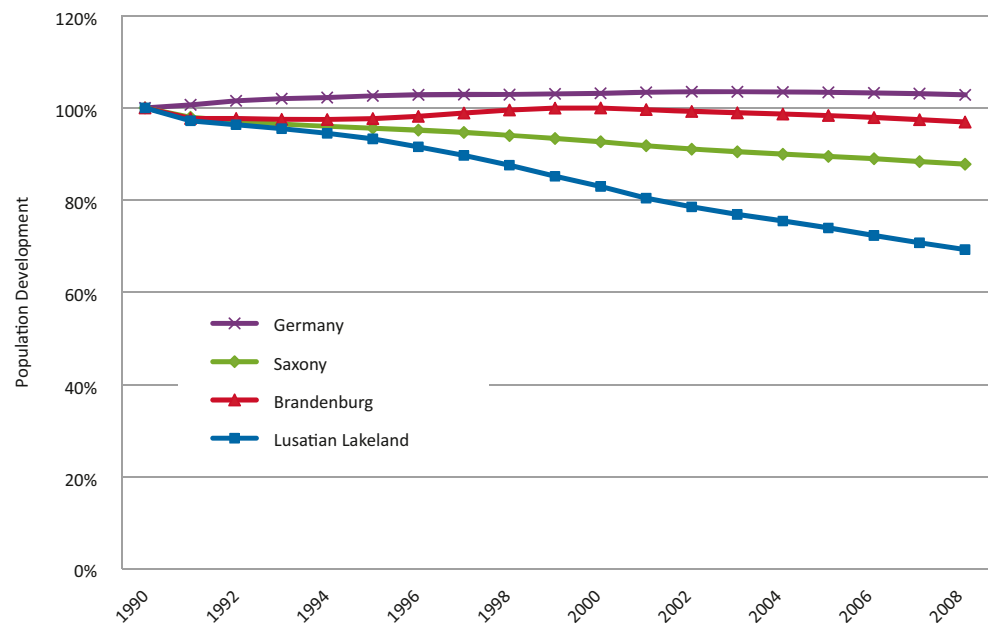
Energy policy in East Germany changed: lignite lost its state-decreed special status as the main source of energy. As a result, lignite mining declined and countless unprofitable factories were closed: including fourteen briquette factories and several lignite-fired power stations in Lusatia. This, in turn, caused the number of staff employed in Lusatian coal-fields to fall from around 65,000 in 1990 to approximately 20,000 in 1994. Despite the federal government intervening in the economy with social policy measures, such as the founding of job-creation companies, unemployment in the present Lakeland area soared to 15 % by 1992 (see Fig. 2). This triggered a wave of out-migration and by 1994 6 % of the local population had left the region (see Fig. 3).

Owing to the re-cultivation deficits that had arisen under the planned economy before the Economic and Currency Union came into effect on 1 July 1990, and the unification-related closure of many open-cast mines, 60,000 hectares required rehabilitation. In 1991, initial rehabilitation pro-

**Fig. 2** The development of unemployment in *Lusatian Lakeland* 1991–2008. (Data basis: Federal Employment Agency, Senftenberg Branch)



**Fig. 3** The population development in *Lusatian Lakeland* from 1990 to 2008 (1990=100). (Data basis: the Federal Statistical Office and the statistical offices of Berlin-Brandenburg and Saxony)



jects were launched, focusing on stabilising the slopes of the open-cast mines and tips, rehabilitating the water resources, and clearing up residual industrial pollution (von Bismark 2004: 12 f.)

On the one hand, the efforts of the municipal and state actors were directed at rescuing the core of the lignite industry, saving jobs and encouraging new companies to settle in the region. On the other hand, land-use plans had to be prepared and the municipal infrastructures modernised. Future plans were initially inspired by what people were accustomed to, that is: a regional economy based primarily on industry and, above all, on the generation of energy. There

was no comprehensive development strategy for contemporary *Lusatian Lakeland*.

The municipalities viewed open-cast mining areas as a *terra incognita*, which were marked white in their land-use plans. One exception was Senftenberg Lake, which is located in the western part of the Lakeland and had already been developed from an open-cast mine into a greenbelt recreation area during the 1970s. After the *Wende*, the bordering municipalities and rural districts combined to establish the first municipal special purpose association, *Erholungsgebiet Senftenberger See* (Senftenberg Lake recreation area), with the aim of laying the foundation stone for inter-municipal co-operation in the region.

Despite the lack of a clear regional perspective, some goals were nevertheless set. The ministers of economic affairs in Brandenburg, Saxony and Saxony-Anhalt presented a 10-point paper in December 1991 which included, among other things, keeping lignite as an energy source. It also demanded that the federal state assume the sole responsibility for cleaning up the environmental damage.

It was on this basis that fundamental solutions were now applied to these problems. Within the scope of an administration agreement, the federal state and the *Länder* reached an arrangement on financing the rehabilitation of the inherited ecological damage in the new federal *Länder*. Since then, the federal state has assumed 75 % of the costs and the affected *Länder* 25 %. So far, these have amounted to over 9 billion euro. For co-ordination purposes, a “Controlling and Budget Committee” was established in which the federal state and the *Länder* pass decisions on priorities, budgeting and controlling. The Controlling and Budget Committee was assisted by regional advisory boards working on a trans-*Länder*, multi-level basis. These boards have a say both in the planning and in the setting of the priorities for the various measures. Furthermore, they serve as a link to the regions affected. In 1994, the task of rehabilitation was entrusted to the *Lausitzer und Mitteldeutsche Bergbau-Verwaltungsgesellschaft* (LMBV), as the state-owned rehabilitation company was called. At the same time, lignite was secured as an energy source when the construction of three new block units (800 MW performance class) began at two locations.

### 3.2 Phase II: Major Regional Projects (1995–1999)

Even though the Federal state and the *Länder* rescued a part of the lignite industry and took care of the cost and the rehabilitation work as an initial step towards consolidating the region, the overall situation remained bleak. The unemployment rate continued to rise (see Fig. 2) and migration from the region persisted (see Fig. 3). Against this precarious background, some novel ideas on development arose that were not aimed at renewing industry—*Karl-May-Land* and the *Internationale Bauausstellung Ilse-Park* (IBA/International Building Exhibition)—were proposed for the area that is now *Lusatian Lakeland*.

*Karl-May-Land*<sup>3</sup> was an adventure tourism project. It was to be established in the middle of a landscape created in a former mining area, with the goal of realising a natural and deer park, and designed to accommodate 5,000 guests on an area covering 16,000 hectares. It was realised by a public-private partnership comprising the *Elstertal* special purpose association, established for this project, and a pri-

vate investor. As the project was intended to create approximately 1,000 jobs, it received political support from Saxony and was monitored by an inter-ministerial working team. It was included as a development goal in the remediation framework plan of the regional planning association, and in the rehabilitation concepts of the LMBV, which dated from this period. In early 1998, however, an expert report questioned the project’s economic feasibility. As the promoters were unable to show that the financing had been secured, the state of Saxony withdrew its support and the project failed.

The International Building Exhibition Ilse-Park, in contrast, was based on an integrated design concept that aimed to improve the quality of life, provide recreation, foster tourism and enhance the attractiveness of the region. Job-creation was not seriously envisaged in the plans. A landscape concept was prepared for the core area of the nascent lake landscape around the town of Senftenberg. In addition to Senftenberg Lake, the area also contained some newly created lakes. The concept was designed to open up the towns along the waterfront and to provide opportunities for relaxing by and on the water. Originally, the idea was only sponsored by the surrounding municipalities. The concept was developed further and the area due to be covered enlarged considerably. During the next phase, it was implemented—with the support of the *Land* of Brandenburg—entitled the *International Building Exhibition Fürst-Pückler Land*, with *Lusatian Lakeland* as a key project.

### 3.3 Phase III: Sectorally and Regionally Co-Ordinated Development (1999–2009)

Despite the aforementioned shift in perspective for the planning and concepts, the precarious economic situation of Lusatia and *Lusatian Lakeland* changed very little during the second half of the 1990s. From 1990 to 1999, the Lakeland population fell by 15 % (see Fig. 3), whilst the unemployment rate rose above 25 % at times and remained at this high level (see Fig. 2).

At the time, the *Lausitzer und Mitteldeutsche Bergbau-Verwaltungsgesellschaft* (LMBV) was issuing positive signals. It had made good progress in rehabilitating the land and was now planning to do the same with the water resources. The federal states of Saxony and Brandenburg viewed such progress as an opportunity to strengthen the region economically, too. Both *Länder* launched the *Lusatia Initiative* to support projects that were politically significant and reached beyond the boundaries of the individual *Länder*. In order to implement the *Lusatian Lakeland* project, they founded the *Länderübergreifende Interministerielle Seearbeitsgruppe* (LISA, cross-border inter-ministerial working group) in 2001. This organisation included not only representatives of the Saxon and Brandenburg Land governments, but also of the LMBV, communal tourist associations, planning asso-

<sup>3</sup> Karl May (1842–1912) was a German author who became famous for his adventure stories about the Wild West and the Orient.



ciations, the *International Building Exhibition Fürst-Pückler Land*, and the Lakeland municipalities. The group's main objective was to develop a concept that would connect the lakes via navigable canals and lock-gates.

As the construction of navigable canals was not subject to the LMBV mining laws, new regulation had to be introduced in order to finance the scheme. This regulation was integrated into the administration agreement on the rehabilitation of lignite mining (the so-called Sect. 4 Measures). Although the projects are being implemented by the Federal state company LMBV, financing lies in the hands of the federal states and, to a minor extent, those of the municipalities and local governments. LISA ultimately came up with the idea of a "chain of lakes", which involved networking all the lakes in the western Lakeland area and included thirteen navigable canals for passenger and sailing boats.

To co-ordinate the municipal planning euphoria of the late 1990s, which encompassed beaches, camp sites, hotels, harbours, housing areas, marinas and other tourist infrastructures, the LMBV seized the initiative and prepared—in close co-operation with the municipalities and local councils—so-called utilisation concepts for each open-cast mine. Their aim was to harmonise the development ideas of the municipalities and rural districts with the plans of the rehabilitation companies. In return, the *Elstertal* municipal association, which was originally founded for *Karl-May-Land*, created the *Regionale Handlungs- und Entwicklungskonzept Lausitzer Seenland* (Lusatian Lakeland regional development concept) in 2001, a planning instrument designed for implementing the municipalities' and rural districts' development goals and utilisation concepts. The goal was to develop a distinct tourist profile comprising dwellings, tourism, water sports and nature conservation on and by the lakes, and also to establish and develop original attractions that would serve as image-makers (brands) and sell the Lakeland beyond the *Land* boundaries. Proceeding in this starting point, a model was propagated with the aim of transforming the area from a region centred on mining to one centred on tourism and energy. Tourism and the use of regenerative energies were designed to trigger dynamic, long-term, crisis-resistant and (in the long term) sound economic development. This concept was discussed at a number of regional conferences and adopted by the municipalities and rural districts in 2003. Even now, it remains the basis of regional activity.

To better co-ordinate developments in Brandenburg and Saxony, the regional planning associations on both sides of the *Land* boundaries began working on a joint regional plan for the *Lusatian Lakeland* in 2002. This project, which was supposed to regulate the uses of water and the areas designated for leisure activities and recuperation, foundered, however, because of conflicting views on expenditures and effort, and on the application of regulation at this level.

Even so, the first projects were implemented. A breakthrough was achieved on networking the lakes when the first canal was completed in 2003. Meanwhile, eight of the thirteen canals have either been completed or are under construction. Three new lakes now have boat moorings, bathing beaches and sports facilities. For some years now, cyclists and skaters have been using the circular routes created by mining specialists around each of the largest lakes.

The *IBA Fürst-Pückler-Land*, which sought to provide impulses for the much-needed structural change at the economic, design and ecological levels, has set new trends in the *Lusatian Lakeland* (Kuhn 2010). In 2004, it opened the *IBA Terraces*, which function as visitors' and information centres. Furthermore, a number of residential programmes were initiated by and on the water. An impressive "landmark", a steel observation tower, soon became a huge attraction among visitors.

As new tourist attractions appeared, marketing tourism in the *Lakeland* became increasingly important. The two tourism associations, the *Tourismusverein Lausitzer Seenland* in Brandenburg and the *Touristische Gebietsgemeinschaft Lausitzer Seenland*, founded in Saxony in 2004, have meanwhile taken the first steps towards improving co-ordination among previously redundant marketing structures. Together, the two municipal companies are developing products with private suppliers in the *Lakeland*.

#### 3.4 Phase IV: The Development of a New Tourist Destination from 2009 on

By the end of the year 2000, the state of the region had generally improved somewhat. Since 2005, the unemployment rate has fallen to about 15 % (see Fig. 2). And although the population size continues to fall, the rate of decline has slowed down over the past few years (see Fig. 3). If these are interpreted as signs of consolidation, they can hardly be attributed to the new perspectives that have opened up in the region, because these are too insignificant to serve as an effective economic motor at this early stage.

Now that the envisaged water level has been reached in the first lakes and several navigable canals, as well as the first private tourist projects, have been completed, the region is gradually beginning to turn into a tourist destination. The LMBV's work now increasingly focusses on creating good-quality lake water. Canal construction is making good progress. In 2009 all of the *Lakeland* municipalities and local districts on the Brandenburg side joined forces to create the special purpose association *Lausitzer Seenland Brandenburg* (*Lusatian Lakeland Brandenburg*). The Saxonian municipalities and local districts followed their example in 2010 and established the special purpose association *Lausitzer Seenland Sachsen* (*Lusatian Lakeland Saxony*). In 2010, a joint co-ordination office of the *Länder* of Saxony

and Brandenburg for the *Lusatian Lakeland* was set up. It is run by a former district administrator. Under the appellation *Energy Region Lusatia*, the rural districts in Brandenburgian Lusatia are continuing the initiatives launched by the IBA. The Lakeland remains one of the initiative's key projects. Participants in the regional conference in the *Lusatian Lakeland* in 2010 noted that a start had been made on establishing a tourist region there.

#### 4 Discussion of the Empirical Results

Against the background of the theoretical considerations presented in Chap. 2 and the expositions on *Lusatian Lakeland* in Chap. 3, we can now turn to answering the three empirical questions. The connection between the concepts of resilience and structural change will be summarised in the conclusion.

As far as the first question is concerned, it is quite apparent—proceeding from the theoretical considerations presented above—that the former mining district now known as *Lusatian Lakeland* can by no means be characterised as resilient (as defined by Holling) to the shock of 1989–1990. The region was subjected to sweeping economic and landscape changes. The question of resilience can be posed in a meaningful way here only if this term is not used to refer to the preservation of old structures and functions, but to pragmatically indicate that the benchmark variables of regional policy have now returned to the level they were at prior to the shock. An unequivocal answer cannot be given on the basis of the indicators regarded as exemplary for *Lusatian Lakeland*. Although the unemployment rate, which rose for a while, has fallen again (suggesting a certain degree of resilience), the population continues to decline. This raises the question as to which and how many indicators, and with which weighting, must be represented in an overall indicator in order to arrive at a convincing statement. And the question must be raised, concerning the period under consideration, as to whether a twenty-year adaptation period is not too short to make a meaningful statement about resilience in the face of shock as serious as this.

The second question, regarding the actors' adjustment-response and the co-ordination of both lignite rehabilitation and the development of tourism, has been examined most intensively of all. And even though the situation in the region can by no means be viewed as satisfactory, the remarkable results of the extensive development efforts, the co-ordination of environmental rehabilitation, and the development of tourism, are plain for all to see. The developments outlined here, involving many so different steps and phases built upon each other, may be considered an intensive and complex learning process, which has continued up to the present. Although there was considerable state involvement

and extreme pressure to act in 1990, the path that had to be taken was by no means obvious at the time. Instead, there was a process of searching, of trial and error, and of making adjustments. From both the sectoral and regional points of view, there has been a discernible and extensive reorientation on the part of the actors (a frame change), both in terms of their grasp of the problem and in the solutions found. This has gone hand in hand with the corresponding use of, and purposeful change in, the institutional framework with the aim of improving co-ordination.

The *sectoral* re-orientation of the actors can be seen in the fact that, initially, reindustrialisation was still the central goal of economic policy. Little by little, and completely counter to the region's tradition and identity up to that point in time, the development of tourism came to be viewed as a beneficial option, too. For a long time, the actors were simply unable to imagine such a shift. However, once the initial shock had settled, the most pressing tasks had been solved, rehabilitation was starting to make progress, and everyone could see that the water level in the remaining holes was rising, efforts were intensified to rehabilitate the area on the basis of tourism.

Co-ordination among the coalition of actors benefited greatly from the fact that harmony prevailed over the goals of rehabilitation and economic policy. Once the politics of re-industrialisation had been more or less exhausted and a point reached at which a tourist *Lakeland*—viewed from the standpoint of economic policy—could no longer be discounted, tourism was seen as a welcome supplementary option. On the other hand, rehabilitation of the remaining holes created the basis for developing tourism in the area. In the process, the LMBV, a resources-rich rehabilitation company that had initially focused on technical engineering issues, recognised that the rehabilitated areas could only be marketed successfully if it became increasingly involved in municipally and regionally-oriented tourist development goals. Once tourism was recognised as a genuine option by all of the actors, the next step was to develop and upgrade rehabilitation measures, e.g. by constructing canals, as well as by creating sandy beaches and harbour basins, so that these measures would have the greatest possible impact on tourism. Incidentally, owing to the radical change in the system, no lobby groups existed that could have striven to preserve the old economic structures for any great length of time.

As far as the use of various targeted modifications in the institutional framework was concerned, the change in the administrative agreement between the Federal Government and the *Länder*, for instance, proved to be extremely important for co-ordinating rehabilitation and tourism policy on a sector basis. After all, it was only after Sect. 4 Measures (financed by the *Land*) were introduced that the LMBV was able to respond appropriately to the municipalities' and

districts' growing interest in tourist-oriented rehabilitation goals. Also worth mentioning here are the co-ordination instruments that reduced negotiation costs: such as the control and budget committee with its regional rehabilitation councils, and the LISA working group, which prepared the plans for interlinking the lakes with navigable canals. A major roll was also played by the Regional Planning Association, which is responsible for regional and rehabilitation planning. It created a framework that made possible important flows of information between the rehabilitators and the developers. Last but not least, the *IBA Fürst-Pückler-Land*, whose creative ideas also facilitated co-ordination, also deserve mentioned here.

As time passed, it became increasingly clear that the *Lakeland* would be competitive as an overall product only if it could offer a coherent and diversified tourist programme. This realisation prompted the communal actors to radically reconsider their goals and to switch from a competitive to a *region*-based approach. Whereas the municipalities initially drew up isolated plans that differed little from one another, they soon began co-operating on the regional basis and succeeded in skilfully allocating the different tourist functions to the diverse lakes. As far as the institutional framework was concerned, the aforementioned co-ordination instruments were already operating on a regional scale. To develop tourism, the municipalities also set up joint boards that finally united all of the municipalities in both Brandenburg and Saxony. A trans-*Länder* co-ordination office was also established. In the field of tourism marketing, activities were increasingly integrated: the regional development concept was prepared jointly and discussed at a number of regional meetings. Even so, as the setbacks in the inter-*Land* sub-regional planning show: not all of the opportunities for intensifying co-ordination were taken.

As rehabilitation of the mines progresses, the importance of sectoral co-ordination is likely to decline spontaneously. Inter-communal and regional tourism development will remain a demanding task, however, since the development of the area into a tourist region, as desired by the actors, is in its infancy. It seems likely that even if there is a decline in the considerable sums available for rehabilitation and infrastructural development, the regional institutional structures already created, such as the joint boards, will continue to function.

In view of the potential risks of further developing *Lusatian Lakeland*, a third question must also be addressed, namely: how resilient will the region be to shocks that might occur in the future? Even though there is no fully developed indicator system as yet, there are initial signs that the area is less vulnerable now. Even without conducting an extensive sectoral analysis, it is legitimate to say that the regional economy is far more diversified than it was in 1990. And although lignite continues to play a big role in Lusatia, it has

nevertheless lost its dominant position. Tourism is gradually growing, and both trade and industry are more diversified. Furthermore, infrastructures have been greatly improved and the region is now environmentally far more attractive than it used to be—and not only for tourists. As far as political steering is concerned, the adaptability of the actors has improved considerably. They have now “arrived” in the new economic, political and administrative system and have gained a wealth of experience in dealing with structural change. The importance of co-operation between various regional actors has now been recognised. At the regional level, in particular, appropriate new work structures have been developed.

## 5 Conclusions

Proceeding from theoretical considerations and the example of *Lusatian Lakeland*, the present paper seeks to shed light on the way in which the old issue of regional structural change and the capacity to deal with the latter are related to the new concepts of resilience and vulnerability, as well as to those of adaptation and adaptability. Experience in *Lusatian Lakeland* shows that these concepts cannot be applied, without further ado, to the problems of structural change faced by old industrial regions.

The concept of resilience plays an important role here. The much-cited definition, proposed by the ecologist Holling (1973: 14), that the structures and functions of a system must remain intact after a shock, cannot simply be transferred to old industrial regions, because such regions generally show signs of structural breaks. Hence, only a concept of resilience seems to be applicable that is oriented towards achieving once more, and in a structurally neutral manner, the values of certain target figures important to regional politics, such as employment and population size. At the same time, two different approaches must be distinguished here: on the one hand, that of identifying the actual resilience of a region after a certain time in relation to a certain shock; and, on the other hand, that of assessing the resilience of a region in relation a specific future point in time in relation to a potential, but not predictable shock.

Hence the first empirical question is whether *Lusatian Lakeland*, which is marked by extreme structural change, can now be considered resilient in the light of the changes in overall conditions taking place in 1989 and 1990. It is impossible to find a definitive answer to this question because the two exemplary indicators—unemployment and population development—point in diametrically opposite directions. Whereas the unemployment rate has started to decline again and thus tend towards its original figure, the population size continues to decrease. This points to as-yet-unresolved methodical problems in operationalisation.

With respect to the second empirical question: research is being done to determine which adjustment processes in *Lusatian Lakeland* were undertaken in political steering after the shock occurred. Developments there, which have involved many different steps and phases that were based upon one another, can be grasped as an intensive, lasting, complex learning process that has continued right up to the present. In 1990, despite the extreme pressure to act and the considerable state involvement, it was not really evident which path needed to be taken. Instead, there was a process of searching, of trial and error, and of taking corrective measures. The actors were subject to a process of reorientation (a so-called frame change): both sectorally, with a shift away from industry and towards supplementary tourism; and regionally, away from “parish-pump politics” towards joint activity. Existing institutional co-ordination measures were adopted and new ones created, step by step, to co-ordinate not only economic policy and the rehabilitation of the environment, but also the districts and municipalities affected. This process was helped by the fact that the actors shared a degree of consensus on the goals—a phenomenon rarely found in old industrial regions. Furthermore, the option of developing tourism, e.g. by exploiting the rising levels of water in the remaining holes in this post-mining landscape, spoke for itself.

Finally, the third empirical question needs to be asked: whether the development path taken in the *Lakeland* has created a greater resilience to possible shocks in the future than was the case in 1990. Although extensive operationalisation has yet to be performed, initial signs indicate that *Lusatian Lakeland* has become less vulnerable. New infrastructures, for example, have made economy more diversified and adaptable. Furthermore, adaptability has improved considerably at the level of political steering. And in the meantime, the actors have become familiar with the new economic and political-administrative system. Even though political steering has not focused on ways of dealing with future shocks, the learning experience gained through co-operation during the adaptation process and the co-operative structures created is likely to prove helpful in the future.

On the whole, discussion on structural economic change in old industrial regions, as well as on coping with change, can be grasped—with certain reservations and a great need for operationalisation—in terms of resilience, vulnerability and adaptability. Even so, awareness of this will not automatically produce new insights. In some cases, attempts have been made to apply approaches from the field of ecology to research on structural change. Hence, Simmie and Martin (2010), for example, are working with the notion of panarchy<sup>4</sup>, which combines the concepts of resilience and

adaptive cycles. The application of this model, however, which proved unsuitable for studying *Lusatian Lakeland*, tends to produce rather conventional results. One thing is certain, however: that the concept of resilience has focused greater attention on regional adaptability with regard to future shocks. In view of the dangers that international economic developments present to towns, cities and regions, there is still a great need for research in this area.

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systems” (Simmie/Martin 2010: 33). In the context of regional development, the following four phases are distinguished from one another: exploitation and growth, conservation, decline and release, and, last but not least, reorganisation and restructuring. Resilience has its zenith in the exploitation and growth phase and diminishes towards the end of that phase; the reorganisation and restructuring phases culminate in the exploitation and growth phase and decline towards the end of both this and the conservation phase. Resilience grows again during both the decline and release phase and the reorganisation and restructuring phase (Simmie/Martin 2010: 33 f.).

<sup>4</sup> The term “panarchy” stands for a “model that posits a four-phase process of continual adjustment in ecological, social and environmental



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