Understanding Processes of Institutional Change within Local Common-Pool Resource Systems: Can the 'Analytic Narratives Approach' help?

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Paper

to be presented

at the 10th IASCP Biennial Conference

"The Commons in an age of Global Transition: Challenges, Risks and Opportunities"

,

9-13 August 2004,
Oaxaca, México

Preliminary Draft. Please do not cite without the author's permission.

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1. **Introduction**[1]

Abrupt changes in a nation's political and economic structure – such as, for example, the postsocialist transformations in many Central and Eastern European Countries - very often have long-lastingly destabilising or even destructive impacts on local common-pool resource systems. Such all-encompassing political and institutional changes often result in completely altered resource use patterns, new actor constellations of resource users, reallocation of property rights and use rights on the resource or on the related management infrastructure as well as in reorganisation at all levels of administration. Here, institutional arrangements change substantially within a comparatively short period of time. However, our understanding of the driving forces of these processes of institutional change is still rather fragmented.

In this paper, the concrete example of a local water management system in a postsocialist reclamation area in East Germany will be investigated. Here, more then ten years of institutional change have resulted in an physically and institutionally dysfunctional system of water regulation. This system, centrally and hierarchically organised during socialist times, has been degraded and is operated in an uncoordinated manner. This paper aims to explore the reasons for the physical and institutional failure of the present water management system in the Schraden. More precisely, I will investigate the process of change that has lead to an institutional structure that has been unable to successfully deal with the problems. This paper is organised in two main parts. In the *first part*, I will sketch out preliminary results of the analysis of the processes of institutional change. In the second part, I will outline a research concept that might allow us to go beyond these first results and to develop a more comprehensive and theory based understanding of those processes.

The *first part* of this paper is based on empirical material collected within the context of the GRANO project between July 2000 and February 2002. The GRANO project was a cooperative project of research institutions from Berlin and Brandenburg. Its objective was to develop and implement approaches for sustainable agricultural production in Northeast Germany, taking into account economic, socio-cultural, ecological, and environmental concerns (Müller et al. 2002). The activities focused on two research regions – one of them was the fen region Schraden. In this region, twelve qualitative, semi-structured interviews were conducted with farmers, local environmentalists, and the regional Water Association as well as with representatives of the agricultural, environmental, and water administration at

[1] . The author acknowledges the financial support received from both the GRANO project under a grant from

the district and at the state level. Furthermore, notes taken during seven meetings of the regional Agri-Environmental Forum (AEF) between November 2000 and February 2002 were analysed. The AEF had been initiated by the GRANO project and regularly assembles 19 regional actors to discuss options in overcoming the problematic situation of water management (Arzt et al. 2002). Moreover, available planning materials, regional statistics, and other local information available for the region were consulted.

In order to analyse institutional change, Hagedorn et al. (2002) suggest an explorative concept focusing on four groups of determinants: The first group consists of the features and implications of the transactions – such as excludability, rivalry, and complexity related to nature and the ecosystem. The second group comprises the characteristics and objectives of actors – such as the values, attitudes, and social embeddedness involved in those transactions. These two groups of determinants in turn affect the third group – namely, the design and distribution of property rights on nature attributes – as well as the fourth, which pertains to the corresponding governance structures necessary in guaranteeing the rights and duties and their use in coordinating transactions. In the first part of the paper, this analytical framework will be used to structure the empirical material and to explore the causalities that led to the physical and institutional failure of the water management system.

In the *second part* of this paper, I will suggest the Analytic Narratives Approach as a suitable and comprehensive analytical concept to investigate such dynamic and complex processes of institutional change. It combines analytical tools commonly employed in economics and political science with the narrative form, often used by historians. The development of a specific institutional arrangement or structure is understood as a result of a set of context-related individual or collective decisions. It will be argued that the understanding of the pace of institutional change can be increased by combining theoretical knowledge with the richness of historical detail. Furthermore, in order to structure the context of respective decision situations the explorative concept already described will be utilised again.

the German Federal Ministry of Education and Research (BMBF) and the German Research Foundation (DFG).

Part I[2]

2. Ecosystem characteristics and land use

The Schraden fen land is a 15-kilometer-long section of the moderately sloped Breslau-Magdeburg glacial valley located 89 meters above sea level in the West and rising to 94 meters above sea level in the east; it covers approximately 11,400 hectares. The first reclamation measures in this former wetland were carried out in the fourteenth century and consisted of small ditches equipped with weirs. By 1755, approximately 1,850 hectares were permanently being used as grasslands. Arable farming, however, was still restricted to as little as 62 hectares (Dietz 1755 in Grundmann 2001: appendix B). Reclamation activities intensified in the second half of the nineteenth century, mainly for the extension of grassland farming in an area that was still dominated by inaccessible alder forests and swamps. Furthermore, it was intended to reduce the often-disastrous effects of seasonal floods on the villages and towns in the region, and to minimise health risks associated with extensive swamps, such as malaria. Hence, the major watercourses were straightened and diked, small water arms back-filled, and extensive drainage works (ditches) built. Indeed, these activities reduced the danger of flooding substantially. But because the water table almost immediately sank by about one meter and because there were no more annual floods in the spring bearing fertile sediments, the grassland yields rapidly decreased. Most of these dry plots were now turned into arable land (AVP 1998). In 1920 4,000 hectares were used for arable or (dry) grassland farming, whereas the intact fen land had been irreversibly reduced to only 2,000 hectares due to bog subsidence (Berger 1931).

In the 1960s and 70s, reclamation measures reached their peak in the so-called complex melioration carried out in the German Democratic Republic (GDR). [Generally, 'complex melioration' measures are all activities that lead to a sustainable increase of productivity and cultivability of areas used for agriculture or forestry (Könker 1991). This also includes (rural) road construction and land structuring. Only 'hydromelioration' measures such as drainage and irrigation are being discussed in this paper. For convenience, they will be subsumed under the term 'reclamation' in the remainder of the paper.] Large drainage systems – mostly open ditches up to three meters below ground, but also various forms of title drainage – were installed to lower the ground water table. This system of ditches and channels was also equipped with weirs and pumping stations to enable irrigation by flood and even by

[2] The better part of the first main part of this paper is going to be published in *Environmental Management* in

infiltration, if necessary. By 1997, there were 330 various ditches and small channels totalling approximately 300 kilometres in length and equipped with about 170 weirs, which were able to regulate the water table within the entire Schraden.

Presently, as much as 88% of the area is used as agricultural land, 78% of which is used for arable farming. Forests cover only about 3% (AVP 1998: 33ff). As a consequence, the long-standing and intensive arable farming of the fen land has led to an increasing, nearly irreversible degradation of soil (e.g., bog subsidence). The soils run dry during arid periods, losing more and more fertile soil and organic matter due to wind erosion. Generally speaking, these negative effects of drainage on Brandenburg fens had already been officially observed in 1987, when Lehrkamp (1987) noted that soil degradation had caused the average yield of arable farming to fall back to the prereclamation level in some areas in the Randow-Welse-Bruch. Based on interviews with farmers and independent observations carried out in 1998, the authors of a so-called agri-structural preplanning study (AVP) described a similar trend for the Schraden and concluded that continued intensive drainage and arable farming would make agricultural land use impossible in the medium or long run.

From an economic standpoint, the environmental problems described are strongly related to both the fact that certain components of the resource 'fen' can be regarded as a local public good and to the existence of external effects. For example, a farmer nonintensively using his (wet) grassland also 'produces' a habitat that is home to diverse plants and animals typical for this type of (wet) grassland, which in turn might please visiting hikers or be valuable for biologists. On the one hand, excluding hikers or biologists from these benefits is costly, if not impossible. On the other hand, long-standing drainage and intensive arable farming of the same plot could result in external costs – or a 'public *bad*' – simply by depriving future generations of their 'stock of fen land.' The biodiversity 'produced' or retained by farming the fen land in a habitat-adapted manner might be highly valued by society. Due to its public good character, however, biodiversity cannot typically be allocated appropriately by price mechanisms on markets. Consequently, a farmer maximising the return on his asset 'fen land' might prefer arable farming and a low water table, thus reducing the biodiversity and further degrading the fen's soils.

The AVP also pointed out that degradation combined with soil compaction from the use of heavy machinery has resulted in the soil's almost complete inability to hold water; thus, a high level of water runoff will be experienced if not held in check by well-functioning and

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2004 (Schleyer 2004).

coordinated weirs (AVP 1998). For reasons explored in more detail in Sections Four and Five, however, water management facilities in the Schraden are often degraded and operate in an uncoordinated way. Of 108 weirs examined more closely in 1998, 42 were found to be out of order (AVP 1998: appendix 10). The significance of this fact becomes apparent when one considers that the climatic water balance in the Schraden is negative (Landgraf 2001) and the average annual rainfall is fairly low (573-631mm from 1951 until 1980) (AVP 1998: 20). As a consequence, plots with a relatively low (natural) ground water table frequently suffer from drought periods in the summer, resulting not only in negative income effects for farmers, but also in negative environmental effects for the plants and animals that depend on a particular ground water level. Since 1990, water-intensive crops such as potatoes have become increasingly replaced by maize and rape as well as rye and barley (Hanspach and Kißro 2001). The issue of an (at least temporary) scarcity of water enables a recasting of elements of the observed problem as a common-pool resource problem often connected with irrigation systems. Distributional issues become important, as common-pool resources have limited flows of resources and one person's use subtracts from the quantity available to others (Ostrom et al. 1994). Hence, common-pool problems seem to be both "more prone to conflict spirals and less prone to solution through institutional mechanisms designed to alleviate market failure than public good problems" (Barkin and Shambaugh 1996: 429).

3. Stakeholders' characteristics

In the GDR, one of the central objectives was the intensification of agricultural production in order to reach (national) subsistence farming targets and to subsequently export agricultural products. The logical consequence was therefore "to eliminate obstacles that slow down (agri-)industrial production" (AVP 1998: 8f, author's translation), such as the annual flooding or waterlogging of land, and to turn wetlands often used as grassland into more productive, arable land. The reclamation infrastructure that was installed in the Schraden was designed to cover the entire area and to meet the needs of large agricultural firms farming very large plots. The relatively low number of weirs compared with the total length of the ditches (see Section Two) indicates that there was no need to regulate the water table for small plots. Indeed, there were only four large agricultural cooperatives farming the agricultural land in the Schraden by 1976 (Hanspach and Kißro 2001). As congruently pointed out in every interview, all interests regarding the management of the reclamation system were dominated by agricultural production goals defined by the central planning system up until the unification in 1990.

The interests, however, became significantly more diverse after unification. First of all, the respective requirements primarily concerning the ground water table of the newly restructured and reorganised agricultural firms have become quite heterogeneous and now greatly depend on farm size and location (e.g., upstream or downstream), crop structure, and economic performance. Apart from a few part-time farmers with small plots, there are 13 different agricultural enterprises – one of which is a tree nursery – with various legal forms and ownership structures predominantly farming on leased land (AVP 1998: 78; Hanspach and Kißro 2001). Here, farm size varies between 320 and 1,870 hectares (AVP 1998: 102).

Second of all, interests regarding nature conservation have become much more prominent since 1990. These interests are predominantly represented by the respective environmental administrations, such as the Brandenburg Environmental Agency at the state level and the Lower Environmental Agency at the district level. Nongovernmental environmental associations, however, are still of lesser importance at the regional or local level. Nevertheless, it became clear during the interviews that these environmental interests are not homogenous; they have diverse aims. For some environmentalists, the dominant strategy is to bring the degradation of the fen land to a halt or even to reverse the process. This can only be achieved by sustaining very high ground water tables all year round, making agricultural land use impossible. Another group of environmentalists aims at preserving the species and habitats typical for extensively used (wet) grassland. They demand a comparatively high ground water table during the winter, too, but only moderate water levels during the summer, thus allowing for extensive grassland farming. In this case, a high water table sustained all year round would have negative effects on both agricultural production yields and species typical for wet grassland (Vogel 2002). Hence, the interests of agriculture and environmental protection are not necessarily diametrically opposed, but conflicts in resource use persist.

Other interest groups – such as forestry, industry, housing, construction, and transportation services – also demand ‘safe’ ground water tables to avoid flooding and other damages. Operators of gravel pits in this region, for example, require sufficient flood protection to make opencast mining possible. Yet they also need a sufficiently high ground water table in order to use floating excavators. In contrast, private and professional fishers prefer high water tables all year round. It therefore became clear during the interviews that agriculture and nature conservation are not the only divergent interests but are clearly the dominant and most powerful ones.

4. Property rights on land and reclamation systems

Apart from big landowners, whose land had been appropriated during Soviet occupation in the years before 1949, as well as some exceptional cases, land belonging to a vast majority of East German private farmers and landowners was not formally expropriated during collectivisation (Peinemann 1995, Laschewski 1998); they were, however, forced to bring their assets into collectively organised production units (Swinnen and Mathijs 1997). Hence, these agricultural firms were only allocated usage rights and were integrated into the central planning system. This essentially meant that landowners had little or no influence regarding their own interests (Schüler 1991). Furthermore, formal property rights became meaningless, as land rent went unpaid. As a result, the formal ownership of land remained fragmented – almost as it was in the 1950s – while the agricultural firm structure underwent immense changes (Laschewski 1998). As can be observed in the Schraden, these changes were often linked to comprehensive land consolidation measures and extensive reclamation measures. In other words, plots that had had little infrastructure were suddenly considered 'enriched' by ditches and weirs. These assets of the newly built reclamation systems were regarded as collective property.

Shortly after unification, collectivised land in the Schraden was restituted to the legal owners, who received full property rights. This step revived the fragmented land ownership structure. Most of the new/old landowners quickly leased their land to the newly restructured and reorganised cooperatives; these are now joint stock companies, limited liability companies, or producer cooperatives. In 1994, the Brandenburg Water Act (BbgWG) finally replaced the GDR Water Act, formally reorganising the responsibilities and rights for rivers, channels, and ditches and dividing them into two categories. Only those bodies of water belonging to the (new) first category were declared state property and thus the responsibility of Brandenburg. As regards the reclamation infrastructure in the Schraden, only a few of the former main ditches now belonged to this first category. That which remained – i.e., all open waters of the second category including the weirs – were to become legal property of the owners of the bordering properties.

The remainder of this section highlights two critical aspects of the property right reallocation process that greatly contributed to the water management system's continued failure.

Legal insecurities. The future legal status of the reclamation system – and hence the rights and responsibilities for maintenance and operation – were unclear following unification. The

Brandenburg Water Act was introduced in 1994 but did not solve the problem. The reasons were manifold: First, the related Federal Law on Melioration Plants (MeAnlG) of 1994 explicitly ruled only on the property rights of *drainage* works at waters of the second category, which now belonged to the respective landowners whose property bordered on these open waters. Most weirs, however, were intended and built for *irrigation* use not covered by this clause (Pollack 1991). The same law determined that the ownership of these *irrigation* works should only be turned over to the landowners in the year 2000. Second, as the interview with a representative of the Lower Water Agency revealed, water authorities are as yet unable to enforce the related duties and responsibilities, because land owners cannot be held legally responsible for assets found on their land – such as ditches or weirs – that they neither wanted nor built. Here, the issue of 'successors in interest' to the organisations and administrative authorities once responsible for the reclamation infrastructure before 1990 was and still is unresolved.

Fragmented land ownership and leasehold. After the restitution of land in the Schraden, the majority of owners decided to lease their land to the new agricultural enterprises instead of starting their own farming business or using the land for other purposes. According to the statements of interviewed tenants, most landowners do not know about the reclamation works on their land or are not aware of the related (legal) rights and duties. What is more, many owners no longer live in the region, have nothing to do with the farming business, and own only very small plots. There are also cases in which the owners are not known, cannot be found, or ownership is legally disputed. In all cases, however, the owner of a section of the reclamation infrastructure, such as a weir, would have to explicitly agree to any maintenance or operating measures to be carried out. Otherwise, the activity would be regarded as illegal. Only recently have most new or renewed lease contracts contained some clause transferring all rights and duties related to the reclamation works to the tenant for the time of the lease.

5. Governance systems: the local level

As stated above, the reclamation works that were built in the GDR in the 1960s and 70s were regarded as collective property. Nevertheless, firm responsibilities and rights for specific system categories – rather than formal property rights – had been allocated to different organisations and administrative levels, as outlined in Figure 1 in the Appendix. Figure 1 shows that planning, building and, in part, financing responsibilities were predominantly aggregated at administrative levels above the local. In contrast, most of the maintenance and operation activities were delegated to local reclamation cooperatives with compulsory

membership for all agricultural firms. As members of the reclamation cooperative and with the support of the Water Management Directorates (WWD) and the Departments of Water Management at the district level, these large-unit firms could easily provide the necessary technical infrastructure, human resources, and financial means to maintain and operate the lion's share of the infrastructure. Increasing agricultural production was the overriding goal defined by the central planning system and was binding for all firms alike. In addition, a well-functioning reclamation infrastructure safeguarded high production yields. As a result, the interests among firms regarding maintenance and operation were rather homogeneous. Coordination of such activities was also facilitated by the large size of the production units. As stated time and again in interviews, local actors perceived this structure as operating smoothly.

After 1990, the large agricultural cooperatives at the local level disintegrated into smaller and more focused enterprises with different legal forms and ownership structures (Wiegand 1994, Laschewski 1998). Consequently, the reclamation cooperatives – interfirm organisations of enterprises that began competing directly on the market – were soon dissolved without substitutes. In order to ensure the necessary water runoff, and to avoid damage by floods or a high ground water table, the maintenance and cleaning duties of second category ditches were formally assigned to the regional water associations in 1995. These water associations had been established shortly after the unification. The Water Association Kleine-Elster Pulsnitz is responsible for the Schraden area and is supervised by the Brandenburg Environmental Agency. Membership in the associations is compulsory for all municipalities representing those landowners subject to land rates. As interviews with farmers confirmed, the tenants effectively pay the membership fee as an implicit part of the rent. Other beneficiaries (e.g., railway companies) can be voluntary members.

Financial limitations. Like other water associations in Brandenburg, the activities of the regional Water Association Kleine Elster-Pulsnitz are financed solely by membership fees, as there are no regular subsidies from the state. Representatives of the Water Association stated that the available funds are only sufficient for the compulsory tasks – i.e., maintaining and cleaning the *ditches*. Noncompulsory measures, such as maintaining or operating the *weirs*, are only carried out occasionally and if auxiliary funds are available. Means to mitigate the problem include state support programs, which can be used for project-related maintenance tasks but not for basic operating costs. Some programs, however, require water associations to match this funding with up to 50% of their own funds. Here again, the scarce capital resources of water associations are stated as the limiting factor.

Solidarity principle. Another way to ease water associations' financial limitations would be to increase membership fees in order to make the care of the weirs financially 'profitable' as well. Interviews, however, indicate that contributors perceive these fees as elevated for the region, and a further increase seems politically unacceptable. This is especially true since membership fees do not correspond to the actual distribution of benefits from the association's activities. While the Federal Water Associations Act (WVG) allows for this differentiation, a solidarity principle was adopted for the Brandenburg Water Act; in other words, the membership fees can only be proportionate to land size.

6. Governance systems: governmental organisations

In 1994 the Brandenburg Water Act established a new administrative structure for water management and planning, which follows the example of the former West German states and emphasises self-government at the communal level. Figure 2 in the appendix gives a brief overview of the various administrative layers of water authorities and water agencies in Brandenburg in relation to the district Elbe-Elster, where the Schraden is situated.

Complete restructuring. In interviews with representatives from the Lower Water Agency in the Elbe-Elster district, restructuring was described as a drastic, complete, and bumpy process. Almost all relations among the various levels of the newly established water authorities had to be rebuilt from scratch. This process has not yet been completed and still reduces interauthority communication to the absolute minimum. Interviewees described the process of long-standing and new civil servants acquiring competency with newly established laws and rules and exploring new space for maneuvering as time and energy consuming. The same holds true for the relations among the water authorities and water users, water associations, interest groups, other administrative agencies, the municipalities, and the general public.

Transboundary interrelations. The aspect highlighted in the previous paragraph was certainly exacerbated by the fact that the restructuring followed completely new political and administrative borders. What is more, one might suspect that this impedes or even hinders the efficient and coordinated handling of a complex, transboundary biophysical system like the landscape water regime. Then again, one should not underestimate the implications of introducing or strengthening river basin management for existing institutional configurations and organisational structures (Göhler 1997; for a general discussion on *problems of fit* and *problems of interplay*, see Moss 2001). In fact, the water regime of the Schraden is greatly determined by the water inflow from the neighbouring district Oberspreewald-Lausitz as well

as the state of Saxony. Interviews with the Lower Water Agency, however, revealed that there are almost no joint activities, informational exchanges, or coordination meetings among the respective water authorities.

Organisational subordination. As shown in Figure 2 in the appendix, the Lower Water Authority operates at the district level. Hence, nearly all decisions related to water management are made from the viewpoint of the district as a whole; in other words, this field's eventual decision-making power rests with the (political) head of the district administration. The Lower Water Agency, which is responsible for the practical work and professional input, is organisationally subordinate to the district's Lower Environmental Agency, which is in turn subordinate to the district's Department of Economics and Environment. With regard to statements made by the Lower Water Agency, this organisational structure is somewhat delicate in its conduciveness to executive decisions that are politically opportunistic rather than purely professional. This also holds true in the choice of key issues, thus largely reflecting political priorities. Accordingly, it was presumed that this constellation might have contributed to the water authorities' prioritising of "more urgent" issues, such as improving the public wastewater disposal system and ensuring the public water supply, which would have required substantial financial, human, and technical resources.

Water management plans. Water management (framework) plans based on hydrological analysis are a necessary prerequisite for actively and efficiently shaping and regulating complex water management systems, which ideally integrate the interests of all water users. The Federal Water Management Act (WHG) takes this into account in requiring a state's supreme water authority to provide such plans for all river basins. In Brandenburg, however, there are few drafts for water management framework plans, even fewer drafts for detailed water management plans, and no drafts available in the case of the Schraden. The water authorities inevitably 'react' rather incidentally to the acute problems or demands of interest groups, other agencies, or the public. This is certainly fostered by the fact that only the main canals or ditches are equipped with devices to measure the water table. Reliable monitoring and sanctioning is thus nearly impossible.

Part II

7. What we have learned so far

The first part of this paper has attempted to illustrate the reasons behind the failure of the present water management system in the Schraden. Investigated was, more precisely, the process of change that has resulted in an institutional structure unequipped to successfully deal with the problems. Intensive arable farming and reclamation measures undertaken decades ago have led to the soil's deterioration and its increasing inability to hold water. Existing weirs, however, cannot prevent the resulting high water runoff; more often than not they are degraded and operated in an uncoordinated manner. Given the local public good character of some features of the fen land, the common-pool character of intermittently scarce resource water within the ecosystem, and the conflicting interests of regional stakeholders, it has been argued that the reallocation of property rights over reclamation systems, together with ineffective coordination mechanisms, have caused the physical and institutional failure of the water management system and thus impeded appropriate land use. More precisely, the combination of legal insecurities accompanied by enforcement problems, fragmented land ownership structure, and a high number of short-term lease contracts have reduced the incentives for the majority of farmers to maintain the reclamation works. Due to limited statutory rights in conjunction with limited financials, the present water association appears to be an inadequate local coordination mechanism. Furthermore, the complete and time-intensive restructuring process at all levels of water administration has resulted in cumbersome or even nonexistent interrelations between various governmental layers as well as in rare transboundary contacts. A lack of water management plans and the organisational subordination of the Lower Water Authority also impede effective administrative work.

In the remainder of this paper, I will outline a research concept that might allow us to go beyond these first results and to develop a more comprehensive and theory based understanding of the reasons behind the failure of the present water management system. This research concept will be put into practice within a recently started research project financed by the German Research Foundation (Deutsche Forschungsgemeinschaft).

8. Moving beyond: Making Use of 'Analytic Narratives'

The aim of this research project is to explore the *main determinants for the physical and institutional failure* of post-socialist water management systems and reasons for the

persistence of these problems. Deficiencies and frictions of the institutional structures will be illustrated and more suitable institutional approaches to overcome the problems will be designed. The general theoretical basis encompasses New Institutional Economics and New Political Economics and, in particular, their applications for the agricultural sector (e.g., Hagedorn 1997). The focus on (post-socialist) water management systems suggests incorporating recent institutional (economic) theories related to institutional change (e.g., North 1988, Knight 1992) in Central and Eastern European transformation countries (e.g., Schlüter 2001, Gatzweiler and Hagedorn 2002). On the other hand, theories related to the co-operative management of Common Pool Resources (e.g., Ostrom 1990, 1998), and to drainage and irrigation systems in particular, have to be considered (Knox et al. 2001, Vermillion 1999, Theesfeld 2004).

With this theoretical background, research will closely investigate the process of change that has lead to an institutional structure that has been unable to deal successfully with these problems. As was revealed in the first part of the paper, this process of institutional change, however, has proved to be highly complex in terms of both the interactions between social, economic, and ecological systems, and the historical dimensions of the system collapse in the transition countries. It can be argued that those historical events can only partly be understood by use of methods constructed to analyse phenomena like price changes, investment behaviour on particular markets, or the adaptation of formal property rights to forces like industrialisation. Furthermore, the rather rudimentary and mostly incomplete scientific understanding of these processes suggests a methodological frame bridging the well-known gap between deductionism and inductionism in the social sciences, thus, regarding both research strategies as supplementary rather than exclusive.

In this research project, the *Analytic Narratives Approach* – introduced by Bates et al. (1998), Greif (1998), Weingast (1998), Rosenthal (1998) and Levi (1998) – will be employed. Following Hanisch (2003: 130), who applied this concept to the privatisation process in Bulgaria, "it combines the analytic tools commonly used in economics and political science with the narrative form, a standard form in history, in order to increase the understanding for the pace of institutional change by combining theoretical knowledge with the richness of historical details. While explaining institutional outcomes, the approach allocates a role to the sequence of historical events as well as certain social structures and values. At the same time, the approach differs from pure historical narratives because the explanation for the sequence of events and the outcomes in terms of rules is scaffolded by the logical structure of economic modelling." In this concept, qualitative exploration methods

provide the empirical basis for possible explanations for specific outcomes. However, they must be accompanied by a systematic analytical process in order to differentiate between 'good' /'valid' and 'suboptimal' explanations. Bates et al. (1998) employ game theory to discipline their narratives.

Making use of the advantages of *game theoretic reasoning* and taking an *actor-based, rational choice perspective* (Scharpf 1997), in this project, the process of institutional change will be understood as a sequence of individual or collective actors' decisions, each characterised by a specific set of personal preferences and coupled with incentives and situational restrictions, Here, game theory provides good instrumentation on how institutional outcomes (structures and dynamics) can be explained via backward reasoning from a specific social outcome to the decision making of relevant actors (Selten 1965). In order to operationalise research, complex chains of causes and effects can be dissolved into smaller analytical units – subgames – that are embedded in a more extensive game structure (Harsany and Selten 1998). Examples for such context-related subgames would be the actors' decision to establish or not a Water Association, or the decision to privatise or not parts of the reclamation infrastructure. Thus, an explanation of a specific institutional result arises from backward reasoning along the respective subgame equilibrium path.

Based on the Analytic Narratives Approach, Hanisch (2003: 133) has developed and applied a procedure for the analysis of institutional change that consists of several recursive steps: „In the first round of empirical analysis, the researcher develops a story about how a certain process of institutional change took place based on field notes and his/her own interpretation of documents and literature. As with any narrative, this story possesses a background, a beginning, a sequence of scenes filled with the experience of qualitative field research and document analysis, and an ending. Once this has been achieved, the researcher tries to recast her/his interpretation of what is important as rational choice hypothesis. New hypotheses may evolve or hypotheses are taken „from the shelf" of a researchers' own knowledge. A process of thought modelling begins, capturing the decisions that make up the single sequences of the story". Subsequently, the quality/ validity of respective explanations can be tested by putting them at risk (Bates et al. 1998: 14): Do their assumptions correspond to what is known? Do their conclusions follow from their premises? Do their implications find support in the data? At this point, when the findings of the empirical research do not confirm one's expectation from the time prior to going to the field, it is time to rethink one's way of modelling the problem. Thus, the dominant response to disconfirmation, however, is not (Popperian) falsification, but *reformulation* (Lakatos 1970, cited in Bates et al. 1998: 16).

As a consequence, the implications for modelling have to be addressed, as well as the question, which additional data/ additional interviewees are needed to test this reformulated model. Only if an explanation obviously fits the theory developed, the next analytical step can be applied: How well does the model stand up by comparison with other explanations? Parallel explanations that are observationally equivalent may exist and, in this case, Bates et al. (1998: 17) suggest that, instead of arbitrating between equivalent explanations, one should try to make sense by subsuming them. Further, how general is a given explanation? Does it apply to analogous cases? Such an iterative approach would also be in line with Dixit's (1996: 35) claim for „dozens of separate small models" that – when put together – would enable an understanding of the whole process.

9. Analytical Framework and Research Process

In order to derive coherent explanations of the process, however, it is necessary to understand why a specific institutional outcome emerged (e.g., a Water Association) *and* to understand why alternative outcomes did not materialise. Thus, among other things, the informal background of an actor's choice, or the *context*, needs to be investigated to make plausible assumptions concerning respective payoff structures. In this research project, the empirical information gathered will be structured by employing the *explorative concept* already introduced in the first part of the paper focusing on four groups of determinants: (1) the features and implications of the transactions, (2) the characteristics and objectives of relevant actors or groups of actors, (3) the design and distribution of property rights on nature attributes, and (4) the corresponding governance structures (Hagedorn 2002). Figure 3 in the appendix illustrates the heuristic analytical framework that will be applied.

The *comparative institutional analysis* will contrast a reclamation region in East Germany, the Schraden region already described above, and the Pyrzyce region in Northwest Poland. In both regions, the present water management systems are physically and institutional dysfunctional. Furthermore, both regions are relatively similar concerning the natural conditions, the history of reclamation, and the agricultural structure. They differ, however, in the historical and societal context, the political-administrative environment, and the process of transformation. In both regions, qualitative field research will be carried out: First, interviews with experts and other researchers will be utilised to further specify the main problems with regard to the water management systems and to collect basic information about relevant actors, e.g., related patterns of interaction, actors' resources and motivations, formal and informal institutions. Second, in order to further specify (and validate) the

identified cause-effect-relationships, predominantly intensive, semi-structured interviews with local stakeholders such as farmers, environmentalists and associations, but also with representatives of the administration and politicians at all levels will be carried out. Furthermore, regional statistics, available planning materials and other available local information will be gathered. Other methods employed include group discussions and participant observations. As illustrated in Figure 4 in the appendix, the methodological approach described above requires a *phased research process* of data collection (interviews, group discussions, document analysis, etc.) and data analysis (transcription, 'thick description', and thematic and theoretical encoding, etc.) Thus, by purposefully jumping back and forward between empirical observation and theory models, successively, the heuristic analytical framework will be filled and (if need be) refined, and the theoretical understanding of the respective process of institutional change will be developed and qualified.

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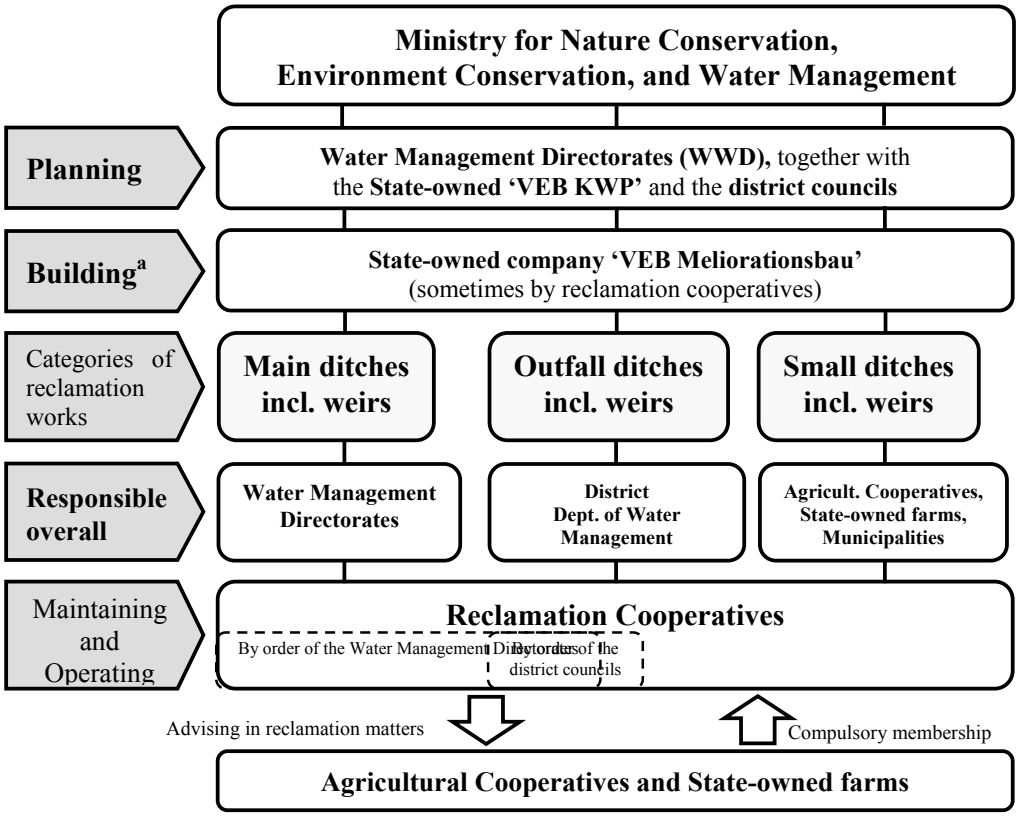
Appendix

Figure 1: Allocation of responsibilities with regard to reclamation systems in the GDR

Source: Schleyer (2004)



[a] Financed in varying degrees by funds from agricultural firms, low-interest loans and state subsidies.

Figure 2: Administrative layers of Brandenburg's water authorities and water agencies in relation to the district Elbe-Elster

Source: Schleyer (2004)

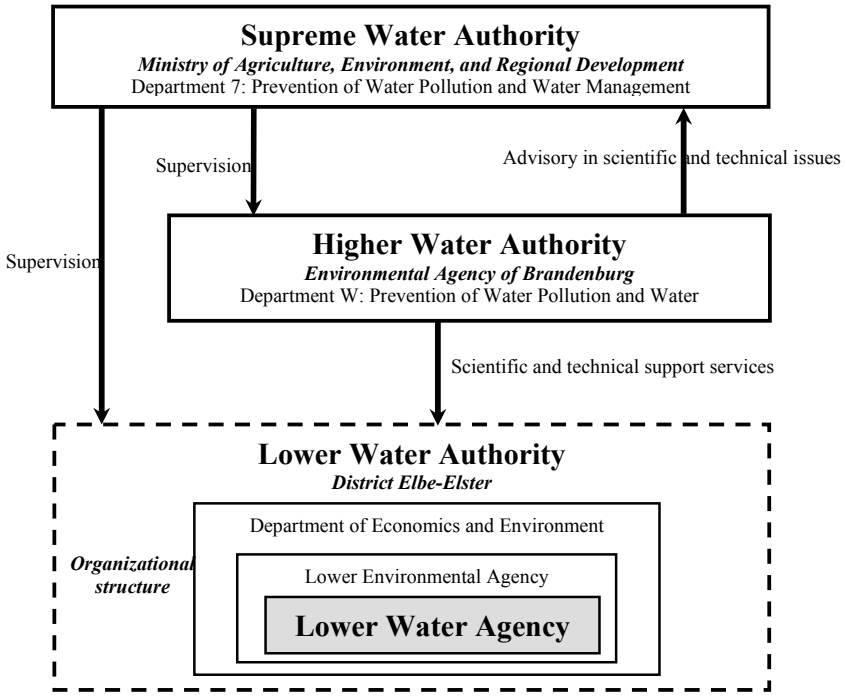
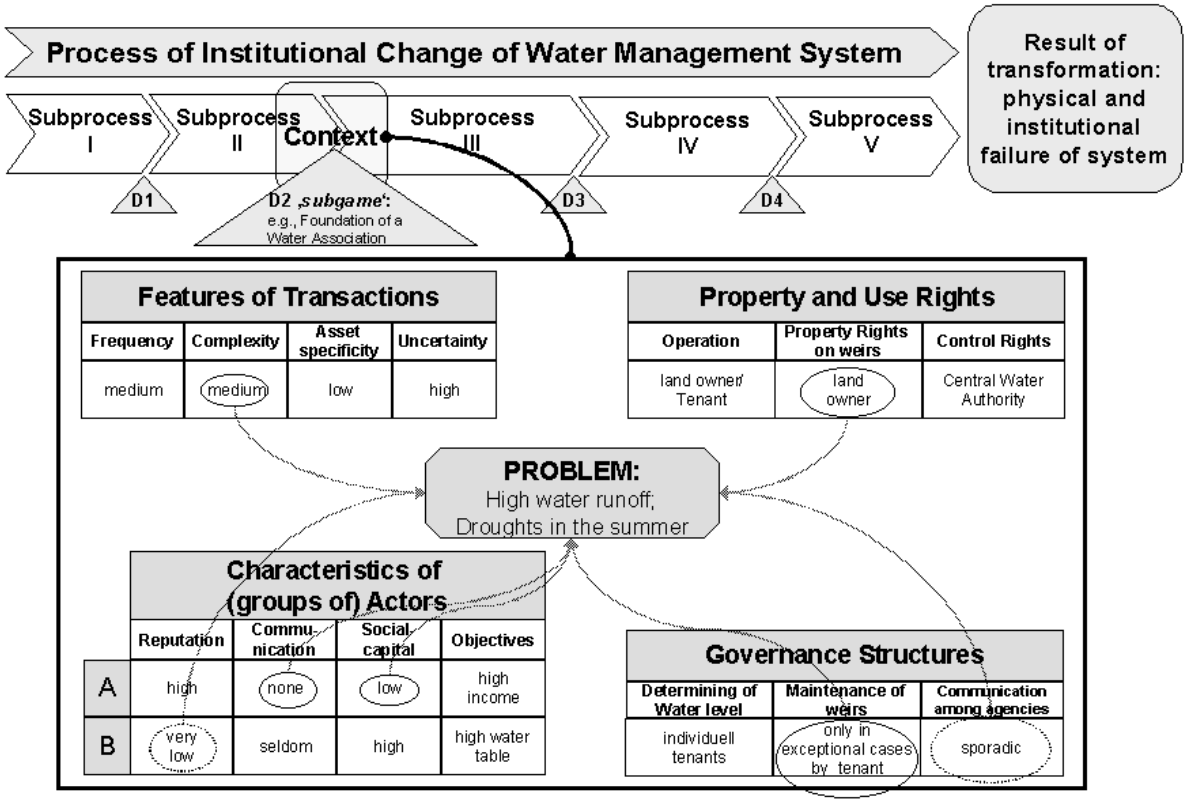


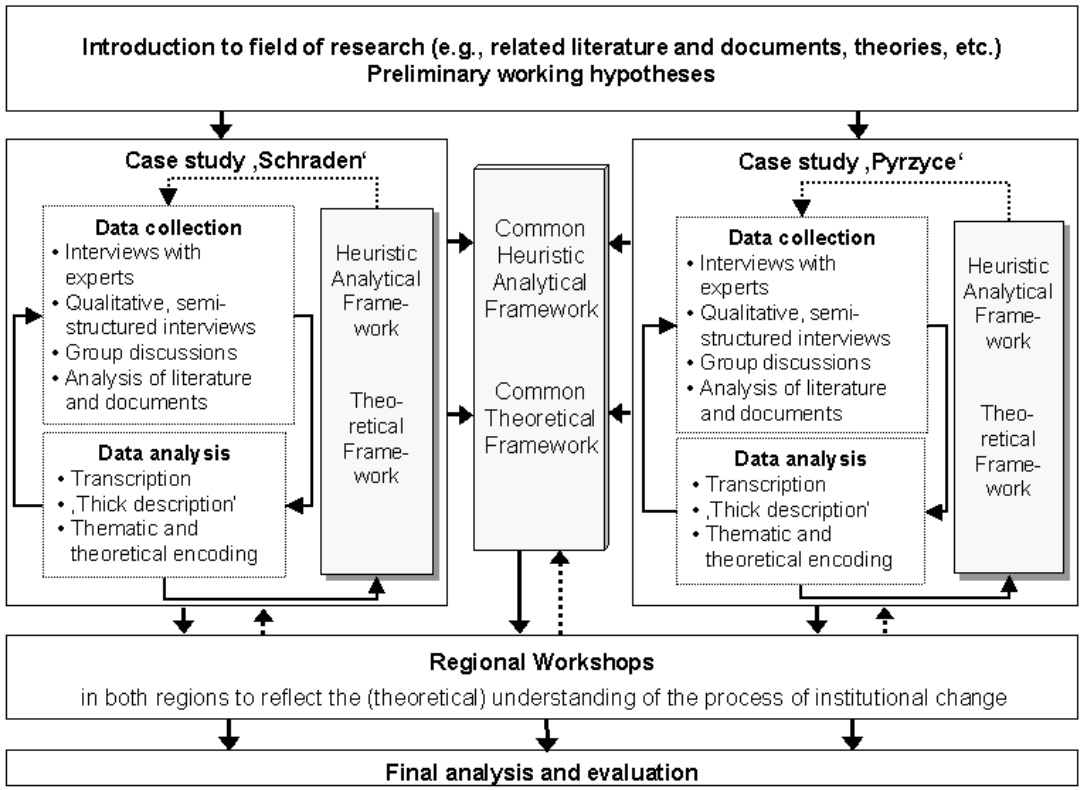
Figure 3: Heuristic Analytical Framework

Source: Own figure



Heuristic Analytical Framework

Figure 4: Research Process



Source: Own figure