Nº de arquivo

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MATTEO ROGGERO

TALK ON WATER

ECOLOGICAL ECONOMICS AND PARTICIPATORY WATERSHED GOVERNANCE

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Resumo

A relevância dos processos sociais, como a cultura, a socialização ou a política, para as questões económicas é inquestionável. Contudo, permanece uma questão: o papel que desempenham é completamente ortogonal à economia ou não? Se a resposta for afirmativa, não há necessidade de intrometer estes aspectos na análise, sendo suficiente avaliá-los através de parâmetros adequados. Se a resposta for negativa, a análise económica deve ser estendida para incorporar adicionalmente a interacção entre os processos sociais e as questões económicas.

Neste trabalho adopta-se esta última perspectiva para o estudo de um problema económico clássico mas ainda actual: como lidar com os "custos sociais". Trata-se de analisar como conciliar interesses incompatíveis para diversos actores: uma questão central para as situações em que indivíduos e grupos têm que encontrar um compromisso entre a Ecologia e a Economia.

Os trabalhos anteriores sobre este tema negligenciaram os aspectos sociais e focalizaram-se no papel do conhecimento e da tecnologia. O contributo do presente trabalho consiste em abordar o problema económico na sua dimensão social, adoptando a abordagem interdisciplinar da Economia Ecológica.

Diversos autores na Economia Ecológica defendem um maior papel da participação na abordagem dos conflitos ambientais. Este trabalho analisa um processo de participação recente entre actores institucionais, da indústria e da sociedade civil que se reuniram para resolver um conflito ambiental. Trata-se dum caso de poluição de um rio causada por actividades extractivas. A "solução" do problema exige um novo compromisso entre a economia, a sociedade e o meio ambiente.

O processo foi centrado na “ciência” implícita no conflito. Os actores esforçaram-se por conseguir uma perspectiva “objectiva” sobre o problema e encontrar uma solução “viável”. Focalizando-se nas opções tecnológicas, dedicaram pouco espaço

para a discussão dos interesses divergentes na origem do conflito. No final, o processo falhou: a maioria dos participantes acordaram numa solução a que dois actores centrais se opõem.

Este caso é abordado através da análise de textos escritos e entrevistas, comparando-se os interesses dos actores no início e no final do processo. A teoria e a concepção do processo assumem que estes interesses não se alteram. Contudo, neste trabalho observam-se mudanças coerentes com as características das discussões que ocorreram no processo.

A interacção social entre os actores constitui um factor de definição duma solução, mesmo quando é dada uma prioridade estrita à tecnologia. Uma consideração mais aprofundada deste factor pode mudar a forma como os processos de decisão são actualmente concebidos.

Abstract

Nobody would deny that social processes like culture, socialisation, or politics matter for economic questions. The question is: do they matter in such a way that is completely orthogonal to economics or not? If yes, no need to introduce these aspects in the analysis: it's enough to elicit them through appropriate parameters. If not, economic analysis must extend to the additional interaction between social processes and economic questions.

This thesis adopts the latter perspective and applies it to a classical, yet still actual economic problem: how to deal with "social costs". This problem focuses on how several actors settle their mutually incompatible interests. It is central for situations where individuals and groups have to find a middle way between Ecology and the Economy.

Previous works on this matter have neglected social aspects and focused on matters of knowledge and technology. Instead, the contribution of this work consists in addressing an economic problem in its social dimension. By this, it adopts the interdisciplinary approach of Ecological Economics.

Scholars in Ecological Economics have called for a greater role of participation in environmental conflicts. Here, we study a recent participatory process where actors from the administration, industry and civil society meet in order to settle an environmental conflict. The conflict revolves around river pollution caused by extraction activities. A "solution" of the problem requires a new trade-off between the economy, society and the environment.

The process focused on the "science" behind the conflict at hand. Actors strived towards an "objective" perspective on the problem, searching for a "feasible" solution. Focusing on technological options, they dedicated little space to the diverging

interests at the origin of the conflict. The process eventually failed: the majority of the participants agreed on one specific technical solution that two key actors oppose.

We approached this issue through the analysis of written texts and interviews and compared the actors' interests at the beginning and at the end of the process. Theory and process design assume that they don't change. We however observe changes, consistently with the characteristics of the discussions that took place within the process.

The social interaction among actors constitutes therefore a factor in the definition of a solution, even if technology is given strict priority. A thorough consideration for this factor may change the way decision processes are currently designed.

Acronyms and Notations

List of all Acronyms

BAT	Best Available Technology
BATNEEC	Best Available Technology Not Entailing Excessive Costs
BBergG	Federal Act on Mining (German: *Bundesberggesetz*)
BRD	German Federal Republic (German: *Bundesrepublik Deutschland*)
EC	European Communities
EEC	European Economic Communities
ESTA	Electro-Static Processing (German: *Elektro-Statische Aufbereitung*)
EuWFD	European Water Framework Directive
GDR	German Democratic Republic
GG	German Constitution (German: *Grundgesetz*)
GRL	Green Ring Leipzig (German: *Grüner Ring Leipzig*)
KrW-/AbfG	Closed Substance Cycle Waste Management Act (German: *Kreislaufwirtschafts- und Abfallgesetz*)
MP	Management Plan
NGO	Non Governmental Organisation
NIS	New Integrated Salt Management (German: *Neue Integrierte Salzsteuerung*)
NoMs	NoMeasures Sub-Sample
NoPr	NoProcedure Sub-Sample
NRW	North-Rhine Westphalia
PoM	Programme of Measures
RQ0-4	Research Question 0 to 4
RT	Round Table
S++	Extended Sample++ (Sample ++)
UVPG	Act on Environmental Impact Assessments (German: *Gesetz über die Umweltverträglichkeitsprüfung*)
VwVfG	Administrative Procedure Act (German: *Verwaltungsverfahrengesetz*)
WHG	Water Household Act (German: *Wasserhaushaltsgesetz*)
WRRL	German Acronym for the European Water Framework Directive (German: *Wasserrahmenrichtlinie*)

List of all Notations

A	Arrangement
A*	Collectively desirable, optimal arrangement
$A_{n,t}$	Desirable Arrangement for Participant n at time t
A_{SQ}	Status-quo arrangement
C	Closure
$f(x)$	Function of x, depending on x
$f(x\|y)$	Function of x conditioned to y, depending on x given y
I	Inclusion
$M_{n,t}$	Mental model adopted by Participant n at time t
O	Object
P	Process
(P)	Pre-ordered Condition(s)
$R_{n,t}$	Rationality, bundle of heuristics adopted by Participant n at time t
S	Scope
T	Target Function
U	Utility

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Chapter 1 – Introduction

Sections: 1.1. Overview of the issue addressed; 1.2. Topics; 1.3. Overarching research question, specific sub-questions and structure of the thesis.

Take a watershed

Imagine a main water course, a few tributaries, some lakes, wetlands and water reservoirs. Imagine a biosphere surrounding the water streams, rich in biodiversity and possibly hosting some endangered species in terms of fauna and/or flora. Imagine to be able to describe the above mentioned watershed with a set of indicators capturing those dimensions generally considered most relevant for a given academic community. For those coming from basic environmental sciences, such as Microbiology or Soil Chemistry, the interest in the watershed at hand will go to specific physical and chemical indicators. The kind of questions one may be trying to answer would then revolve around the effects of a specific parameter, such as the concentration of a certain compound in the water or the pH of the soil, on the reproduction of a certain species of bacteria, on the availability of a certain kind of enzyme, on the competition between two particular species and the like.

One can then move up one step on the ladder of complexity and approach Ecology. An Ecologist's interest on the same watershed would not concern much a particular parameter or the relationship between two specific ones, but rather how their changes produce shifts into different, more or less stable states of the overall ecosystem. The object of interest has therefore scaled up to one specific feature of the watershed to the watershed as a system, made up of elements bound to one another by a certain set of relationships. More specifically, the focus goes to certain configurations of such elements to in their aggregated properties.

Moving up one more step in terms of complexity, one can introduce a further, particular species: the *homo sapiens sapiens*. In order to address changes in the state of given ecosystems, of which humans are part, the focus necessarily extends

to the way human behaviour alters ecosystem conditions. This is so in light of human resource allocation choices and use patterns being product of individual and collective decisions. By doing so, we approach Economics. In that case, the basic questions one may try to answer would both start and end in the social system, though their explanatory factors would be connected to one another via the ecosystem. For example, one may consider how a fall in land prices in a certain upstream area of our watershed may affect the traffic load of the road infrastructure downstream, knowing that part of that load is due to recreational activities and that these are affected by, say, water quality, in turn affected by the residential load in the abovementioned upstream area.

At this point, causality chains become problematic. That comes to no surprise if one considers the degree of complexity stepwise introduced so far. What is more, the perspective provided herewith pre-supposes a certain degree of determinism – the very idea that causality chains exist and that linking stimulus and response, conditions and behaviour, input and output, dependent and independent variable is a matter of having the right data available. Here is where we come to some surprises: while determinism is well accepted in physics, stretching it over human individual and social behaviour may not be always compatible with the generally accepted basic understandings of it.

In other words, one may assume that a certain chemical compound, under a certain conditions behaves in a certain way and not in others. This is likely to be compatible with what physicists and chemists may say on the matter and will produce statements which are comparatively easy to verify by the means of applying the experimental method. Similarly assuming that an individual, finding itself in a certain situation, will behave in a certain way and not in others may contradict what philosophers, sociologists, psychologists and political scientists would say on the matter.

What is more, this is so not just for matters of complexity but because the systems of knowledge on which the study of individuals and groups rely may not allow statements of the kind “one situation, one behaviour”. Standard Economics does. In the last 20 years, that has led to major criticism and dissatisfaction, particularly with reference to environmental issues. It’s against this background that Ecological Economics has emerged.

The field of Ecological Economics has developed in the early Nineties as a reaction to the way mainstream Economics addressed environmental issues. The dissatisfaction towards the “dedicated” branch of mainstream Economics, namely Environmental Economics, spurred critiques that have addressed both the way ecosystems are treated and modelled in Economics and the way individuals and their interactions are conceived of (Faber 2008). Specific lines of inquiry have developed on both fronts, creating a kaleidoscope of heterogeneous attempts to produce a different Economics.

On the one hand, one can take Ecological-Economic Modelling as an example of addressing the shortcomings of ecosystem modelling in Environmental Economics, without fundamentally altering the way individuals and groups are treated. On the opposite side, one could think of Experimental or Behavioural Economics and of the studies on Common Pool Resources as a way of reframing what we know on humans, without fundamentally altering the way ecosystems (and thus resources) are modelled.

This work locates itself in between. Namely, it focuses on deliberation and decision-making processes with reference to watersheds. It intends to contribute to a possible “Economics of participation”, questioning a few assumptions on the functioning of socio-ecological systems, while exploring an alternative account. In so doing, it surely doesn’t start from scratch and draws heavily from both the tradition and the latest developments in the study of economic institutions so as to tackle the role of deliberation in environmental decision making.

More specifically, this thesis has been developed within a research project, GoverNat, addressing the link between participation and the governance of water and biodiversity in Europe. Current European water and biodiversity regulations such as the European Water Framework Directive, the Habitat Directive and the Birds Directive all “encourage” a certain degree of participation in environmental decision making, though they make so through soft law. This opens up to a variety of very heterogeneous experiences that it is now important to characterise and investigate. What is more, the above shows that there is apparently still much to learn concerning the way humans draw the line between socio-economic and ecological concerns.

These heterogeneous experiences can prove suitable to test hypotheses on what we know about it.

1.1. Overview of the issues addressed

In its standard definition (Kahn 2004), Economics is about choices. Even though this work will soon depart from this definition, Economics as the science of choice still represents a suitable starting point for introducing the study object for the present thesis: choices between incompatible, prospective states of the socio-ecological system. Prescriptions concerning similar choices unavoidably rely on descriptions of the socio-ecological systems in which they are embedded. It will be shown that Economics can yet be further developed in the way it describes both the workings and the object of such choices.

Socio-ecological systems are taken as a reference so as to underline the interdependency of socio-economic processes and their material underpinning (Paavola and Adger 2005, Fischer-Kowalski and Weisz 1999). Stressing the systemic dimension of the object of study is here an important step both in order to introduce its multi-dimensionality and in order to acknowledge the inherent complexity of the choices concerning it. From a systemic point of view, accessing particular features of the physical environment such as grazing areas or water quality is bound to affect other features of the same ecosystem. Behind every feature of the ecosystem, though, there are people. Behind changes of those features, conflicts.

This study addresses choices concerning a plurality of dimensions of the physical environment, affecting in turn a plurality of individuals and groups. If Multiple-Criteria-Decision-Making (MCDM) has gone so far a long way in facilitating the way such complex information is handled for decision purposes (Munda 2004; 2006), much has yet to be done in characterising the social processes prior to the use of a similar (or any other) tool. While scholars have addressed and explored different dimensions in and rationales behind the choice of deliberative tools (Renn 2008; Rauschmayer and Wittmer 2006), similar perspectives haven’t yet started to affect the current

understanding of the economic processes at play (compare Bromley 1989; Gintis et al. 2005; Marglin 2008).

In short (and in a gross simplifications): decisions are treated as either economic or political (Williamson 1999, pp. 319-320; Samuels 1989, pg. 1556). This implicitly confirms the presence of a gap in the understanding of the overarching, pre-ordered process setting the boundary between the two domains. Such a boundary is familiar to those scholars addressing the study of economic institutions, even though most chose to constrain their inquiry within such boundary (Williamson 2000) rather than address it explicitly (Samuels 1989).

The result is a situation where, speaking in Economics terms, one can talk of rational, efficient or even optimal choices, though reality is “messy” and agents “boundedly” rational at best, producing decisions where Economics is traded off against other dimensions. The problem here is not much one of having Economics explaining everything – it is rather one of facing a seemingly tautological situation where the science of choice is asked to explain the pre-ordered choice situation in which it is granted or denied application.

Either Economics is the science of some choices, but not all, or there is a problem in defining the domain of Economics. Sustainability and environmental issues more in general have had the great merit of raising this question. What is more, they demand an answer. They do so because livelihoods depend on the conflict situations that have spurred the study of Economics altogether, namely, those choices concerning the production of wealth, the allocation of labour and the accumulation of capital. Sustainability has made curiosity and puzzle-solving approaches leave the way to issue-driven science (Funtowicz and Ravetz 1993): questions of understanding are joined by matters of urgency, while methodological rigour may have to be traded off against data availability and contingent circumstances. What is more: insightfulness may cease to be an end in itself and becomes functional to specific, normatively set goals.

Along this line, one can try to make the best use of the increasing heterogeneity that characterises present-day Economics: as the following chapters will show, the last twenty years have seen the profession strongly diversifying itself, variously integrating influences from ecology, philosophy, sociology, legal and political studies

just to mention a few. While Climate Change and the present rate of biodiversity loss lead scientists to question what we know about the natural system out there, events such as the hurricane Katrina and the financial crisis that unfolded in late 2008 have shaken deep beliefs concerning the social and the economic system as we (thought we) knew them. All in all, it may be time to depart from orthodox approaches and give a fresh look into present societal challenges.

Precisely in this spirit, the present work draws on insights from branches of Economics sometimes very far away from one another. The aim is to characterise the social processes underlying economic questions in environmental decision-making. It will therefore address the economic problem and the question of (economic) rationality underlying the act of choice. It will furthermore address the question of collective action both per se and in relation to politico-administrative systems as we know them in western democracies. By doing so, it will investigate the notion of governance in general and of environmental and water governance in particular. Finally, the very same notion of environmental problems and conflicts will be explored. Attention will be given to the role “participation” feasibly can and plausibly does play therein.

1.2. Topics

1.2.1. Socio-ecological systems and decision-making

The present work intends to address decision-making processes, in turn producing decisions that identify a certain state of a given socio-ecological system as desirable against several alternatives. Similar decisions initiate a course of action that intends to alter a present situation and move it towards a new state. This means that we deal with the comparison of a present and a plurality of prospective situations. The two differ from one another in terms of the state of the socio-ecological system of reference.

Capturing differences in the state of a socio-ecological system requires a characterisation of the very same system: elements have to be identified, whose

state constitute a reference in characterising both the status quo at the time of the decision and the situation the decision intends to reach. Having chosen to deal with socio-ecological systems, the present work will inevitably have to refer to both "nature" and "culture". Elements from the social system will need to be taken into account as well as elements from the natural system and the interactions between the two domains.

Leaving quantification issues to a later stage, the challenge lies in characterising both domains at first independently, and subsequently explore the interactions between the two. On the side of the social system, what we are interested in are two (interrelated) aspects: the economy and decision-making. This means that our interest goes, first, to achieving an understanding of (a subset of) the economy as the bundle of organised activities societies undertake for provision purposes. Furthermore, we are interested in the way individuals and/or groups take decisions, understood (as above) as the identification of a course of action leading from a present situation to a prospective one.

On the side of the natural system, we are interested in extending the analysis to the material underpinning of the activities carried out within the social system. This means that nature, for the sake of this work, represents some sort of "second-order" set of items compared to those characterising the social system. That is true. However, that doesn't make the natural system any less central: in particular, it will be important to conceptualise nature in such a way that allows different actors to perceive it differently and to engage into a conversation about it. We will then follow them in that conversation about nature and about the socio-economic activities it can or cannot support.

1.2.2. Regulation, governance and multi-level governance

This work intends to characterise decisions on socio-ecological systems from within their collective and politico-administrative context. The systemic view introduced above precludes the analysis from focusing on private decisions at the level of the individual only: as soon as perspectives have to be accommodated, where an

ecosystem supports a plurality of socio-economic activities, a multi-actor perspective becomes unavoidable so as characterise even strictly individual decisions. This is so at least in the light of possible reactions a decision can cause.

A perspective involving multiple actors brings along a coordination dimension which, simply put, is the object proper of cultural, political and administrative systems. Human cooperate so as to approach coordination problems ever since they were hunters and gatherers (Sahlins 1972, Gintis et al. 2005). They do so by setting up both informal and formal rules, norms, conventions (Crawford and Ostrom 1995) regulating their mutual interactions and shaping the performance of the economy they thus define (North 1991).

New Institutional Economics has made the point sufficiently clear, that those regulations operate in a multi-layered fashion, where “marginal” choices are taken on a daily basis in the frame of structures, which instead change over much longer time-frames and sometimes span across centuries. While the first can be considered decisions, the latter are relegated to the study of Economic History and provide historical as much as cultural factors explaining major transitions, revolutions and macro-trends. Some see this as a good reason for economic analysis not to address dynamics in the cultural and historical drivers of economic decisions, focusing instead on getting “the margin” straight (Williamson 2000).

Others have it, instead, that decisions do take place at deeper levels than the margin. It is clear that decisions do take place concerning how much of a given resource to harvest or not to harvest (operational choice): work on the field has shown that the way such decision is to be taken (collective choice) can be similarly object of deliberate decision too, and same goes for the pre-ordered decision concerning who is and who is not to take such decisions (constitutional choice). Economic analysis cannot avoid these layers and relegate them to cultural context factors (Ostrom 1990).

Finally, some stress that in modern market economies similar decisions are the bread and butter for parliaments and courts, making public policy a central venue for the regulation of the individuals’ mutual interactions (Bromley 2006). From this point of view, the very meaning of “the margin” becomes an object of choice. Introducing public policy certainly increases the complexity of the analysis of socio-ecological

systems, yet it appears as an unavoidable step, given both the role of state agencies in actively manipulating the environment and the role of environmental regulations in channelling private activities (both individual and collective ones). The above literature will be systematised in Chapter 3. At this point, the focus rather lies on stressing the two-fold increase in complexity thereby implied.

First of all, an understanding of the bureaucratic apparatus is required, as the operations of public agencies represent a precondition for the capacities of a political system. Secondarily, the setting of boundaries between public and private activities is of relevance for simple matters of distribution, having in turn implications both for justice and for efficiency. Interestingly various scholarships have traditionally addressed both questions hierarchically (compare Olson 1969 and, thirty years later, Adler 2006), with particular reference to the concept of scale (Young 2002).

Recent scholarship has however started to question the hierarchical nature of the relationships both among different units in public, politico-administrative organisations and between them and the private sphere, involving both individuals and private organisations. While a “de-hierarchisation of the state” is observed (Jessop 2004), an increase in partnership forms between public and private entities blur both vertical hierarchical ties and horizontal domain boundaries, so that the network becomes a more insightful metaphor for present-day politico-administrative organisational structures. Much has been published along this line under the header of “governance vs. government” (Paavola et al. 2009, Jessop 2004), which is a major theme within the Multi-Level Governance literature.

Not much has been published, however, that explores this perspective all the way down to what we consider its logical conclusions, namely that whenever hierarchy and authority are fluid, social processes among decision-makers fill the gap. Just to make an example, if power relationships between a municipality and a private utility is ambiguous concerning the definition of mutual duties and obligations, a grey area opens up, where power ceases to provide clear insights in the way the two entities deal with one another: This is so for at least that kind of power which emanates from one’s hierarchical position in a politico-administrative system, consisting namely in the ability to alter someone else’s bundle of entitlements and obligations.

This doesn't mean that the two entities necessarily stop dealing with one another, nor does it imply that they do so in a necessarily inconsistent fashion. The standpoint we take is that, whatever they may have worked out so as to address their mutual interaction, they cannot have worked that out in any other way than by interacting with one another at a pre-ordered level. This acknowledgement is somehow implicit in the literature on Multi-Level Governance, though, to the author's knowledge it is seldom brought up to its full potential: if taken seriously, it shifts the focus entirely away from the analysis of hierarchical power relationships and interest-driven negotiations towards a social process of individual role definition.

This very same acknowledgement sets the stage for this work: we namely intend to investigate the way social processes contribute to shaping decisions concerning specific features (and with them the overall state of a given ecosystem) by altering perceptions and aspirations behind the distribution of entitlements and obligations among a plurality of actors, both public and private, differently operating in the ecosystem of reference.

1.2.3. Participation and social interaction

Shifting the focus to the social dimension of decision-making processes has important implications. Taking terms such as "interest" and "position" for their common sense meaning, the focus broadens from the identification of a decision output given a certain set of interests to the way actors define and reshape each other's individual and possibly their common position concerning the decision at stake. In these terms, the analysis moves to a stage which is prior or pre-ordered to the formulation of a decision, as it affects the very way actors approach it.

We see three main implications. The first one is that, this way, the analysis moves from the realm of "optimal regulation" to the one of deliberation: from a situation where actors know what they want, the question being how to best elicit and aggregate it, to a situation where actors are in the process of working out what they want, the question being how different ways of structuring that very same process may preclude particular potential outputs and advantage other ones.

Secondarily, a similar perspective forces a certain ontological and epistemological standpoint: leaving more technical taxonomies, one needs to assume that individuals have at least fluid approaches to decisions, be it in terms of what they want or in terms of what they know about how to get it. This locates the present work outside of what most Economics out there considers human beings to be and to think (see: van den Bergh et al. 2000).

Please note: not even the most neoclassical scholar would ever deny that social matters affect preferences and values, though economic analysis as we know it starts from that moment onwards, taking social processes for given and over with. The question, instead, is whether anything is left out by assuming a social process to be over when the Economics of it starts. Here is where the third implication of our approach attaches: by looking at an economic question in terms of (or as a function of) a social process, we implicitly have it, that social interaction has emergent properties that make the whole different from the sum of its parts – where the parts are the individuals and the whole is the group and/or society gathered around an economic question.

The reader shall not misunderstand us: nobody would possibly deny that discourse, socialisation, culture and politics matter. The question is: do they matter in such a way that is totally orthogonal to Economics or not? If yes, no need to meddle with these things: it's enough to elicit such parameters so as to calibrate models, the question being whether current valuation methods actually do and/or are able to do so. If not, and that is the perspective we are interested in, economic analysis must extend to the additional properties that social processes have upon economic questions. Interestingly, participation enters the picture precisely here, giving a very convenient twist to the discussion. Namely, we can read both the theory and the practice of deliberative exercises as an intentional shift in those characteristics shaping the social dimension of decision-making processes.

Once again: one doesn't need to involve focus groups or citizen juries to provide otherwise technocratic decision-making processes with a social dimension. Still, what changes between a decision-making process involving, say, bureaucrats only and a decision-making process extended (one way or another) to other subjects is indeed its social dimension. While the notion of what is "social" will be clarified later on, we

can for the moment think of it as anything involving the way individuals deal with one another, communicate, interact.

Participation brings a delta into that: people start interacting in new and different ways. We set out to explore the effects of that specific delta in the context of decision-making processes related to the prospective set-up of a socio-ecological system. More specifically, in this work we intend to lay down Economics in such a way that captures both this delta (as an “independent variable”) and the characteristics of the decision at stake (as a “dependent variable”, respectively).

1.2.4. (Re)defining environmental problems and conflicts

“Governing the Commons”, the most influential book on common pool resources by the Nobel Laureate Elinor Ostrom, opens by stating that “Hardly a week goes by without a major news story about the threatened destruction of a valuable natural resource” (Ostrom 1990, pg. 1). Several insights can be gained by looking at the elements of this sentence. We’ll do so in reverse order of appearance.

First off, we deal with a “resource”. Sticking to common sense, defining something as a resource implies an actual or at least a potential use. As such, a resource is not there for its own sake but for someone to make something out of it, the question being *what* to make out of it. The particular one referred to by Ostrom is furthermore “natural” and “valuable”: we deal therefore with some feature of the ecosystem, something that has to do with nature in the most direct way. We also deal with something, which bears value to someone, something connecting to someone’s desires, needs, appetites, livelihood and the like.

A “valuable natural resource” is being “threatened” with “destruction”. The message Ostrom conveys to the reader here is that, first of all, there’s an event pending, and that event is not desirable – or else we would not talk of a “threat”. The threat is further specified: it constitutes the “destruction” of the valuable natural resource at hand, hence, its ultimate loss. At this point, the question one can raise is: didn’t we deal with a resource, meaning, something which is there to be used? Since when using doesn’t involve losing? Or does Ostrom quote only refer to renewables and/or non-use values?

Ostrom's quote does refer to renewables, indeed. There's however more to the story. The quote certainly applies to competing instances, be it alternative uses (e.g.: forest as source of firewood vs. forest as carbon sink) or alternative ways of use (e.g.: sustainable fishing vs. mass fishing, the question being how much to harvest from the fish stock in a certain time period). Presenting the instance "destruction" as a threat implies the existence of at least one alternative instance, because a threat, by definition, may or may not come. Furthermore, the alternative instance must be desirable, as both terms "destruction" and "threat" commonly have a negative connotation.

How come an undesired event may befall a "valuable natural resource"? Either we talk of something beyond control, or we deal with a resource which is valuable for some, though in ways that are not valuable for others – those "others" desiring the otherwise undesirable event. A similar circumstance can be triggered by missing information ("I didn't know it was so bad for you") or by potential distributive implications of competing ends fostered by physical incompatibilities (either "The chicken today or the egg tomorrow" or "*Mors tua, vita mea*": my life, your death).

So far, nothing special: incompatible ends are a fact of life, while missing information is all but surprising. Economics covers pretty well and extensively both perspectives and they also rather match with what commons sense would suggest. What is then, we ask, the value added of terming such ordinary circumstances environmental "problems"? Awareness raising, with a specific and possibly hidden political agenda attached? Or is it maybe a misleading terminology, possibly to be done away with?

Above, the "economic problem" has been introduced in terms of the question one tries to answer, the puzzle one tries to solve when doing Economics. In a perspective where ecology and the economy are seen as deeply interlinked, is the "environmental problem" basically same as the economic one? We have introduced terms such as "issue" and "urgency" while distinguishing curiosity-driven from issue-driven science. Are issues different from usual problems of understanding in that they have to be solved quicker? Why? Would that be a viable way of distinguishing the economic problem from the environmental one? Is urgency all it takes to distinguish the economic problem from environmental issues?

The present work won't answer these questions – probably, there aren't absolute answers for them anyway. However, the work aims at setting up a perspective that somehow acknowledges a difference there, be it only in terms of hypotheses. More specifically, our interest goes to an analytical approach where protests and conflicts are endogenous already in their undesirable character. The alternative would be to relegate these "messy" aspects of real-life situations to deviance, effectively excluding them from the analysis. Doing so would be void of analytical insightfulness on the very sources of this phenomena. If "problems" and "conflicts" would be treated so, something would indeed go amiss.

We can point that out by going back, one last time, to the Ostrom quote: point of reference thereby is yet another "major news story" about a resource possibly going to disappear. What the quote fortunately stresses is the public debate dimension: that is what, we believe, forces us to consider environmental problems as something inherently different than multivariate optimisation ones. We see a collective and emotional dimension attached. So far we have only seen it acknowledged in intuitive terms by the literature on environmental decision-making, if at all: to the author's knowledge, protests, sit-ins, media coverage of specific events and the like are seldom "part of the calculation" in what has been written on ecological distribution conflicts. We do not want to believe that chaining oneself to a tree or staging a protest in the centre of a capital city are a simple instances of revealed preferences. In these terms, the present work is an attempt to grant due attention to similar phenomena and adequately integrate them at analytical level.

1.3. Overarching research question, specific sub-questions and structure of the thesis

The previous section has laid down that:

- this work focuses on what can be intuitively understood as socio-ecological systems;

- while looking at socio-ecological systems, the interest of this works goes to the way they change as a product of different mixes of economic activities therein;
- changes in the mix of economic activities within a given socio-ecological system are seen in the light of regulatory decisions concerning different distributions of entitlements and obligations among actors;
- concerning decision-making, this work focuses on the social process among decision-makers – intuitively, that is how they communicate and interact with one another;
- focusing on the social processes among decision makers, this work concentrates on the effects of participation, understood as a change in the way decision makers communicate and interact with one another.

Given the above, the broadest possible research question would be: how does participation affect the state of socio-ecological systems? We will term this question RQ0 (Research Question Zero). The following questions will then be referred to as RQ1, RQ2, RQ2a, RQ2b, RQ3, RQ4 – signalling an increasing degree of specificity.

Given the degree of complexity portrayed in the introductory section, fully answering RQ0 exceeds the possibilities of this present work. We can however narrow it down along the topics of interest enlisted above. A narrower but still rather complex sub-question would then be: how do economy and ecology affect one another in a given ecosystem (RQ1)?

The focus on regulation narrows the perspective further. The question thereby reflected would then be: what are the entitlements and obligations that draw the line between economy and ecology (RQ2)? More specifically: How are those entitlements and obligations, which set up the economy, distributed among public ad private actors (RQ2a)? How does that relate to the state of the ecosystem (RQ2b)?

Moving to decision-making, the question shifts from the distribution of entitlements and obligations per se to the process of achieving such distributions in general. This turns into the following question: Following which concepts and criteria did actors

distribute entitlements and obligations among one another, with reference to a specific ecosystem (RQ3)?

Focusing then on participation, understood as that particular variable determining the way actors interact with one another, the question can be made more specific: By which means and processes did actors communicate and interact so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference (RQ4)?

We have here a set of questions at a varying degree of specificity – from the most general RQ0 to the most specific RQ4. We could then proceed deductively or inductively. Proceeding deductively would require a reframing of the above questions along with the literature from the most relevant academic discourses (Economics in particular), the production of an hypothesis and the testing of it against empirical materials. Proceeding inductively would instead require to ground the above questions in a set of precise empirical observations, followed by the extrapolation of not-directly-observed relationships among them.

Deduction and induction will be discussed later on in the text while generally discussing methodology. Even without entering that discussion, there is something, at this point, the careful reader will have probably noticed: both the search for topics of interest and the formulation of research questions were simultaneously grounded in logics and in what is generally referred to as “common sense”. This practice is called abduction (Bromley 2006, Vatn 2005a) and consists in developing theory and observation iteratively and in parallel.

This work is set-up accordingly. Chapter 2 provides an overview of the research context for this thesis: it describes the project’s research strategy and presents the materials that were collected across the different project phases. Chapter 3 constitutes a review of the relevant literature. “Relevance” is thereby understood in terms of providing insights for the further specification of the research questions R0 to R4, the closest possible to R4. Chapter 4 structures the insight of the literature review into a consistent analytical framework for the analysis of empirical materials. Chapter 5 subsequently provides empirical materials, in the form of a rich case description. This has the aim of making the case understandable independently from the specific theoretical architecture of this work. Chapter 6 applies the analytical

framework to the empirical case, providing an additional layer of insights on the case and on environmental conflicts with the same characteristics. Chapter 7 finally draws conclusions for the broader research context of this study.

Chapter 2 – Research Context

Sections: 2.1. The overall project context: GoverNat; 2.2. Review of the materials collected; 2.3. Outcomes and implications for the thesis.

2.1. The overall project context: GoverNat

This thesis was developed within the GoverNat project. It is important to provide information on the project context as it sheds light on how the thesis's topic and general approach have evolved.

Given the short timeframe of three years for both project work and the dissertation, synergies between the two had to be sought after. The project has a specific thematic focus and foresees data collection phases. The thesis has integrated both of them by identifying a topic compatible with the project's aims and by approaching empirics in the frame of the project's data collection. This integrative approach is detailed out in the final section of this chapter. This section intends to provide basic background information on the project, while the next one presents the materials collected throughout the project's different phases. The general reference for this section is the project documentation available on the project website[1].

The GoverNat project (Rauschmayer et al. 2007) explores the link between participatory processes and environmental governance. It draws on the analysis of a broad range of case studies of water and biodiversity governance. In each case study, it addresses the need for improvement of specific governance schemes by addressing the role of particular participatory and analytical approaches. The materials from the different case studies are then brought together so as to explore the link between participation and environmental governance in a multi-level context. Put in these terms, the core of the research endeavour behind the project has three main elements: environmental governance, participation and the multi-level context.

[1] http://www.governat.eu.

[2] One has to consider implementing agencies as one actor out of many, while the "degree of participation" must be understood as the specific design of the participatory process or alternatively as the participatory profile of the

Environmental Governance – The rationale behind the focus on environmental governance lies on the ongoing implementation of key European regulations: the Natura 2000 Network and the European Water Framework Directive, representing the cornerstones of biodiversity and water management in Europe, respectively. These two regulatory bodies have a fairly similar structure and set the stage for decisions and policies concerning watersheds and protected areas across the European Union. Interestingly, both of them foresee a certain degree of participation, intended as the active involvement of all affected parties in the decisions concerning their implementation.

Participation – Participation in environmental governance has been studied since a few decades now. It addresses the different ways of formulating decisions with contributions from a broader range of actors than formally compulsory. Assessing the desirability of it is not a straightforward matter and academic work so far has addressed similar questions at length. On the other side, the topic is appealing whenever the implementation of specific policies may lead to conflicts. A closer look in view of the implementation of the abovementioned regulations is therefore worthwhile. Studying the implementation of European directives introduces however new aspects.

Multi-Level Governance – Natura 2000 and the Water Framework Directive are implemented in a context, the European Union, encompassing actors over multiple levels (local, intermediate, national, supranational, etc.). Their interactions escape traditional federalism notions and are in a process of constant change as of today. Whether and how participation works in this context is still to be demonstrated, calling for both a review of existing methods and practices and for an exploration of how participation is taking shape at the moment, within the actual implementation process of Natura 2000 and the Water Framework Directive.

In order to explore the intersection of the three topics above, 9 research fellows (including the author of this thesis), based each in a different research institute in Europe, have set out to collect empirical materials for the three years of their

participation to the project, supported by 3 postdoctoral fellows and several senior scientists throughout the network. A research framework based on prior work was provided at the outset (Rauschmayer and Wittmer 2006). It had the aim of identifying the key topics of interest and of clarifying the main expected relationships among them. The fellows first carried out preliminary interviews with the aim of fine-tuning the research approach through a scoping exercise. They then set out to carry out three rounds of case studies on the basis of the framework provided. After the first round, the framework was revised and expanded.

The new framework encompassed six main blocks. The introductory section captured general aspects of the case at hand, allowing the fellow to state what makes the case interesting. The second section collected specific and detailed information about the social, economic, political, cultural and environmental aspects of the case. The third section focused on the multi-level aspect of the case. The fourth section captured the design aspect of the participatory process adopted in the case. The fifth section dealt with the specificities of environmental governance. Finally, the sixth and last section allowed the fellow to round up the account given of the particular case, providing insights that weren't fully covered by the previous sections and adding personal remarks.

The task for the fellows was to provide qualitative evidence from empirical cases, either through secondary analysis of available materials or by actively researching on a certain case of own choice. The choice of cases to investigate was left open, as issues of data availability precluded the use of centrally defined and representativeness-oriented case selection criteria. Nevertheless, the geographical spread of the project consortium, together with the different nationalities and the professional networks of the fellows allowed for a wide coverage of countries and for a certain heterogeneity of settings. The search for cases was also facilitated by the prior scoping exercise.

The project had also dissemination objectives. Each fellow was confronted with the additional task of communicating both personal and project-related results to the broader audience of academics and practitioners. In our case, a workshop was organised later in the project. The workshop has involved practitioners from the

different case-studies. The discussion among them has been documented and yielded the insights that can be found in 2.2.7. below.

The following section provides a brief review of the materials collected by the author of this thesis. For matters of space, we have omitted references to specific interviews or materials. Instead, the research reports handed in throughout the project constitute the general reference for the remainder of this section. The interested reader can contact the project management and request them so as to verify the soundness of the different analyses.

2.2. Review of the materials collected

2.2.1. Consultations

The first materials collected within the project constitute a set of 12 semi-structured interviews. The interviews took place between October and November 2007, involving mainly consultants and representatives of public administrations and NGOs from Germany. The interviewees were active at local, intermediate, national and international level. The interviews were carried out on the basis of guidelines by Jouni Paavola, Sustainability Research Institute, Leeds, UK, leading the corresponding working package. The individual interviews took from 60 to 150 minutes and focused on the interviewee's experiences with participation and with the multi-level character of water and/or biodiversity governance.

Below, we enlist some of the points that emerged from our own interviews. The findings achieved at project level can be found instead in Wesselink and Paavola (2008).

- Some public agency officials see the implementation of water and biodiversity policies as a purely technical issue, free of degrees of freedom and value judgements; other officials acknowledge instead a certain degree of freedom

in the way they fulfil their duties and perceive a need to better integrate local knowledge and user preferences into their work;

- A decrease in emotional confrontation on environmental issues can bring better qualified arguments into the discussion;
- Public agencies entrusted with the implementation of environmental policies do not necessarily have a complete and exhaustive knowledge of the ecosystems they manage; they are nonetheless aware of this knowledge gap and value inputs from users and laypeople;
- Citizens' awareness of and interest for the role they can play on environmental issues through participation is low, unless they have specific interests to defend;
- The direct involvement of individual citizens is seldom: current participatory processes target group representatives such as those from environmental NGOs, industry and sector organisations, citizens' committees, communes, lower level officials and officials from other policy areas;
- The administration is very careful with the implementation of policies that would require changes to land uses and economic activities: technicians in particular do not see such changes as feasible options; wherever unavoidable, compensation must be provided;
- Users and stakeholders seldom interact with one another: public agencies act as a mediator and deal with them singularly for the most;
- The current level of participation (limited in most cases to online information disclosure) might prove insufficient for the realisation of management plans;
- Means are not necessarily always available for the achievement of a good ecological status: the availability of funds from "above" can heavily affect choices over measures to be realised;
- Measures do not necessarily fully correspond to "functional needs", both in the light of their historical character and in light of the incentives provided by subsidised infrastructure policies;

- "Functional needs" are not necessarily the only driver in the choice of specific measures: the availability of bureaucratic capacities and the distribution of responsibilities seem to play a role as well;

- Internal verification must not be taken for granted: the same agency can be entrusted with both certain works and the verification thereof; this leads to conflicts of interests;

- External verification is weak: EU complaint procedures are lengthy, costly and pronounce mostly in favour of public agencies; NGOs do not have the means to challenge all processes and can focus only on those with the most promising circumstances.

Being the result of a scoping exercise, the above represents a starting point for the formulation and testing of hypotheses rather than a reliable set of conclusions. Few suggestions can be drawn from the above. First, interventions reflect a certain way administrations see the challenges inherent to the implementation of water and biodiversity regulations. This way of seeing things is only weakly linked to the constituencies affected and is apparently not homogeneous across administration branches. If this is the case, one could generally address how the degree of participation alters the link between different perspectives within an administration and the way the same administration eventually proceeds in order to achieve the substantial goals of a given policy. This has a direct link to RQ4[2] and shapes the approach to the case studies that followed.

[2] One has to consider implementing agencies as one actor out of many, while the "degree of participation" must be understood as the specific design of the participatory process or alternatively as the participatory profile of the decision-making process. The hypothesis formulated here matches then with RQ4, which reads as following: "By which means and processes did actors communicate and interact so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference (RQ4)?"

2.2.2. The Krebsbach Dam

The case at the Krebsbach Dam constitutes the first removal of obsolete water infrastructure in Germany. A dam, built during GDR times on the Krebsbach river in east Thuringia, on the border to Saxony, had lost its main purpose (water reservoir for extraction purposes). In the light of the dam's maintenance costs, the public water operator decided for the removal of the dam and the realisation of a floodplain environment instead, despite the fact that the reservoir, in the meantime, had assumed new functions and uses for the local population.

The decision concerning the removal implied the trade-off between different costs and benefits simultaneously provided to different groups under different scenarios. Divergences between losers and winners could not be settled throughout the process. The process predated the introduction of the Water Framework Directive and was thus led according to German law. It involved a degree of late-stage participation in the form of a public hearing. The reservoir was emptied in 2007. The dam has then been removed, while the artificial floodplain has been built on the same site.

The case shows nicely how the same intervention on the same piece of infrastructure (and thereby on the same ecosystem) can mean different things for different actors. The dam was built 1962-1964 in order to provide water to nearby uranium extraction sites run by WISMUT (Soviet-German extraction company). This purpose was lost from 1985 on, making the dam unprofitable in the light of its maintenance costs. From that point in time, the dam was only used for drinking water storage and for recreational purposes. For some of the locals, the dam had also an "implicit" value in terms of flood protection. The dam was never completely full and was at least perceived as a retention basin.

The process of discussing and settling this conflict has focused on the trade-off between two different visions of the area, each providing a different set of environmental services to and requiring different contributions from different actors. One option was to maintain the dam, basically providing water recreation possibilities and a certain degree of perceived flood protection to the local residents. The question would then be to allocate the maintenance costs. Alternatively, costly, physical interventions could be undertaken, creating a floodplain of different

recreational value, though with comparatively negligible maintenance costs in the future.

How did the involved parties interact, so as to approach the issue and formulate a decision? The procedure for a decision of this sort in the German legal system foresees public hearings – the only step where public officials necessarily come in contact with the affected parties. The adjudicating body settling divergences and finally authorising the process is the local administration. Some organised protests had already taken place by then. Until the hearing, though, officials basically approached the decision in isolation. At that point, the terms of comparison for the decision whether to remove the dam or not basically included the difference in monetary costs between the removal and the maintenance interventions, the difference in conservation value and recreational value of the two alternatives. The first point was favourable to the removal while the latter two points were nil. Of course, this reflected the point of view of the officials of the public water operator.

During the hearing, two actors tried to alter the terms of the decision. The recreational fisher association opposed the attribution of the same recreational value to both alternatives. The local residents introduced the flood protection dimension to the decision. The fishers' claims were dismissed. Instead, the residents successfully convinced those officials authorising the project that additional measures were necessary in order to compensate for the lost flood protection. Those measures consisted in a couple of new embankments and in the renovation of a bridge.

It is still debatable whether the additional interventions were justified. Specifically, it is not clear whether the floodplain without additional interventions differs from the reservoir in terms of flood protection. If that is the case, it is also not clear whether the additional interventions compensate for that difference. They certainly differ in terms of prestige and aesthetic value for the residents and their administration. By chance, the local administration is also the one adjudicating the case and authorising the interventions.

The same administration has to live with the large and disappointed fisher community. One could say that "in return" they benefit from the new infrastructure paid for by the public water operator. In these terms, one can speculate on the scientific or technical soundness of the decision. By any rate, the flood protection

argument had certainly a very strong appeal in the light of the major floods that took place in the neighbouring Saxony just a couple of years earlier.

The above also shows the complex distributional profile of the case, and reflects some of the aspects emerging from the consultations (technocratic vs. integrative approach; link between confrontation and quality of the arguments; role of organised groups; relative role of functional aspects). The case also suggests that the participatory design of decision-making process as foreseen by German regulations (information disclosure plus late-stage hearing) is not necessarily a guarantee for satisfactory outcomes. The following case is remarkably different in some of these respects.

2.2.3. The Living Sprotte

The second case consists of a pilot project for the implementation of the Water Framework Directive on a small river in Thuringia: the Sprotte. The project dates 2004 to 2006 and was one among several pilot projects for the implementation of the European Water Framework Directive in Thuringia. The project consisted in the realisation of a broad range of interventions necessary for the achievement of a good ecological status. The latter is hindered by severe river fragmentation, erosion issues and past morphological interventions constituting a serious obstacle to an ecological betterment of the Sprotte.

A pathway towards the solution of the basin's problems encompassed the construction of fish ladders, the re-engineering of some river segments and the renaturation of certain key spots in the watershed. However, many of those interventions involved surfaces on private land, with fragmented ownership relationships, partly under agricultural use and scattered across 14 different municipalities. In the absence of tools and legal instruments for an authoritative realisation of those interventions, voluntariness constituted a key aspect of the process. Several platforms were therefore established in order to involve the different actors (municipalities, landowners, farmers, citizen, public officials).

The different interventions caused different typologies of costs to different actors: e.g. construction costs for the public agencies and the municipalities involved, loss of areas for agricultural or recreational use for the landowners and/or the users, administrative costs for the authorising offices and coordination costs for the project management funded by the municipalities. The nature of these costs is however such, that they cannot always be compensated with money. This is so because the personal attachment to specific plots of land or the collective attachment to some characteristics of the river go sometimes beyond their monetary values.

Some parts of the project could not be realised for the missing approval of key landowners. The missing approval was justified on (lay) perceptions of an increased exposure to floods connected with particular interventions[3]. However, acceptance for the interventions and for the new layout of the river basin could finally be achieved through intensive communication efforts as well as through a careful planning of all implementation steps. The latter aspect constitutes however a cost in itself, raising the question whether a similar degree of complex, integrative implementation can be achieved by public administrations with the means normally available to them.

From this perspective, the most striking result of the project was not the (ambitious) realisation of fish ladders, stream ramps, circumvention channels, renaturation measures and all sorts of interventions that proved necessary. It was rather the capacity of all actors involved to organise and coordinate action, discuss interventions and come up with a satisfactory arrangement. Crucial for this to happen has been the involvement of a private engineering and planning bureau which could capitalize on prior projects and on an extensive knowledge of the area, held a good reputation in the eyes of the actors involved, and could plan interventions conveniently for most affected parties.

Interestingly, it seems difficult to say that the planning was more integrative for the Sprotte than it was in the Krebsbach case. Most interventions had a technical rationale and little room was available for collective decision-making. The difference

[3] The specific part of the project that couldn't be realised is the surface-intensive creation of meanders, slowing down the water flow, halting erosion and allowing for a water ecosystem to develop. Landowners did not allow the meanders to be constructed on their land, even though the loss of land was actually minimal and compensations were available. The same landowners straightened the river banks in the past and perceived a straight, highly embanked and fast flowing river as more secure against floods. Technicians did not share this view but did not succeed in changing the landowners' perceptions.

between the two cases seems instead to lie in the degree of acceptance that the processes could achieve. Participation limited to hearings as in the Krebsbach case turned into confrontation. A broad (but costly) strategy of targeted communication efforts as for the Sprotte was able to make the project appealing to most. Interestingly, the same dynamics could be observed within the same project as for the following case.

2.2.4. Panke 2015

Panke 2015 is the name of a pilot project initiated by the environmental office of the Berlin State Administration in cooperation with its counterpart in State Brandenburg. Similarly to the Sprotte case, the pilot project aims at gaining experiences in the implementation of the European Water Framework Directive. The project encompasses an integrated set of renaturation measures targeting the Panke, a small river (about 30km) flowing for about a third of its length through the Brandenburg countryside and then crossing the Berlin districts Pankow and Wedding before joining the Spree (Elbe river basin).

The project required a high degree of cooperation both between the two state administrations involved and across different units within them. Interestingly, as the cooperation between the states didn't return the expected results, the processes were led in the two states in very different ways, providing interesting materials for comparison. On the Berlin side, several ad-hoc platforms were established so as to include affected parties in the overall process of planning the measures. On the Brandenburg side, the drafting of an intervention package happened strictly within the established procedures foreseen by German and Brandenburg state law. In this sense, we have an interesting blend between the process design we encountered for the Krebsbach project and the one taking place on the Sprotte.

The core of the implementation process on the Berlin side lies in the Steering Group. The Steering Group came about as the initiative of the project coordinator within the Berlin administration. The project coordinator simply organised informal meetings with the aim of exchanging information with potentially involved colleagues from other

branches of the state administration as well as from the districts. As such, the Steering Group did not have a formal legal status or authority. Instead it offered the possibility for the different officials, implementing the Directive for the first time, to jointly establish goals and approaches, (consensually) distribute tasks, clarify issues and exchange technicalities.

Ahead of the planning, participation workshops were run so as to establish an interface between the administration and the residents of Wedding and Pankow. During the workshops, separately run in each of the two districts, participants had the possibility to exchange information with those officials entrusted with planning the measures. They also had the chance to express wishes and formulate proposals. These inputs were collected and integrated into a planning document. A second event was organised in order to show what could and what couldn't be taken up and why. The resulting planning document as well as the overall progress of the project was also communicated to the broader audience by the means of public celebration events (three, so far) called "Days of the Panke" and organised in cooperation with the Brandenburg side of the project.

In Brandenburg, the technically necessary measures were planned in partial cooperation with the Berlin officials. The planning documents were drafted according to the regular competences foreseen by the state's regulations and were integrated into the planning at river basin level. The Programme of Measures and Management Plan for the Elbe river basin are publicly available, both in paper copies and on the internet. The interested citizen has the possibilities to view the plans and submit statements within a certain deadline. Furthermore, the authorisation processes for the individual measures require mandatory, late-stage hearings of the affected parties, whose outcome however can only discretionarily be taken up by the authorising agencies.

The combination of statements on the Elbe planning and hearings on the individual measures constitute the platform for citizens to interact with the Brandenburg State Administration concerning the arrangements for the Panke. Within the administration, instead, interaction takes place fully hierarchically. The result of this is a situation where the lower-level officials have to realise measures on the Panke that have been planned by higher-level officials from the Brandenburg State Administration with little

or no input from residents, landowner and from affected parties more in general. The officials expect to meet the opposition of the affected parties as soon as the process will reach the first operational phases.

On the Berlin side, the platform within the administration officials proved instead a valuable tool for the implementation of the Water Framework Directive. The approach will be repeated, at least in its present informal configuration. The interface between the citizens and the administration has also scored positive results. A second round of workshops was set up so as to communicate the final planning of measures and show the links with the citizens' suggestions and requests. The planning was received positively. Some sources also show an increased interest in the Panke and its recreational possibilities.

Finally, the cooperation between the two state administrations was not satisfactory. This circumstance is attributed mostly to missing willingness to alter established procedures. Both sides acknowledge that. They however intend to cooperate more closely in the future. This circumstance suggests to focus on the interactions both among and within organizations and offices while drawing lessons from this specific case and also more in general.

Entitlements and obligations relating to the Panke can be distributed in many different ways and thus give rise to different arrangements. For this case it is important to register that the best arrangement for the Brandenburg administration is not only likely to be different from what the citizens would prefer. It seems also to be different within the several braches of the same Brandenburg State Administration. It is also different from what the Berlin State Administration would like to see implemented.

If the above holds true, limiting the analysis of the participatory dimension of the two processes to what happens between the administrations and the citizens may put very different administrations on the same level and miss out on a very valuable insight. Namely, the case seems to suggest that those administrations that behave cooperatively within themselves, also do so with their own citizens. Vice versa, those administrations that behave hierarchically within themselves, seem to do so with their citizens too. This perspective seems to offer a key to understanding the following case.

2.2.5. The Watershed Connection Project

The fourth case study addresses ongoing water tourism developments in the city of Leipzig, the second biggest city in the German federal state of Saxony. An intercommunal coordination platform has been established shortly after the reunification with the purpose of restoring the city's surroundings left badly damaged by the GDR industry. The platform is called the Green Ring for Leipzig and serves as a catalyser for urban projects with environmental aims and socio-economic by-products. Among those projects, the GRL hosts an integrated water-tourism concept, combining watershed restoration efforts with recreational development possibilities.

In the past, Leipzig and its surroundings constituted the most important energy and chemical centre of the GDR: coal extraction activities and the chemical industry represented the main pillar of the region's economy. The entire sector collapsed with the re-unification in 1990, leaving behind large-scale contaminated sites, poor water and air quality and mass-unemployment. Several policies at municipal (Leipzig), state (Saxony), federal (Germany) and supranational (EU) level currently try to re-vitalise the region and increase its attractiveness for business.

The specific project at stake aims at exploiting the social and economic opportunities of a large mining site-recovery plan. A large amount of funds is namely available for the transformation of the former open-strip mining sites into artificial lakes. Starting from this baseline, the idea at the core of the project is to connect these artificial lakes to the city's rivers, creating a large scale network of water bodies for recreational use – hence the project's name: "Watershed Connection" (*Gewässerverbund*). The rivers at stake host however a series of protected areas. The increased recreational use, together with the necessary physical interventions may therefore prove detrimental to the conservation objectives of those protected areas.

The project is characterised by a clear trade-off between ecological concerns and socio-economic developments. From the point of view of participation, it is interesting to investigate the way the actors involved, holding competing interests on both the

ecology and the socio-economics of the project, interact. The case revolves around the way the Green Ring for Leipzig, as a platform, shapes their way of interacting while deciding about the Watershed Connection project. For example, the trade-off above has been object of dispute between the nature protection office and the watershed management office of the Leipzig municipal administration for many years. The case was apparently settled in 2006, when a private consultant produced a study detailing out what recreational use of the watershed would be compatible with its conservation objectives. The study, called “Water Tourism Use Concept”, was commissioned by the Green Ring.

The Green Ring encompasses different fora within a hierarchical and thematic architecture. At the most overarching level, there is the Green Ring itself, which has a voluntary and informal character so as to allow every interested party to join in. At more operative level, there are six different working groups dealing with specific topics. Among them, the Working Group on Watershed (*Arbeitsgruppe Gewässer*) gathers those that are interested in water-related issues. Access is formally open to everybody. Due to its thematic focus, the Working Group on Watershed is the forum of the Green Ring that deals the most with the Watershed Connection project.

Things are different for a third platform called Coordination Group Watershed Connection (*Steuerungskreis Gewässerverbund*). This is a smaller group focusing only on this project. Inclusion is here de facto restricted to a little number of key decision-makers holding central posts in the City and State Administration. The platform doesn’t officially exist and doesn’t therefore alter formal competencies. However, it allows for political decisions to be consensually taken concerning the specific interventions and sub-projects supporting the Watershed Connection project. According to the interviews, this is only possible due to the restricted inclusiveness of the platform and its informal character.

The last point is important. There is no forum within the Green Ring that takes decisions concerning the Watershed Connection project. In no forum several actors are required to select binding courses of action striking a specific balance of their different individual interests. Instead, actors meet, discuss and take decisions autonomously, based on their own individual role in the realisation of the project (which include the authorisation and commissioning of specific technical measures

as much as the decision, for example, whether to file a lawsuit and adjudicate specific aspects of the planning in the court).

The above implies, for example, that the bundle of individual decisions taken within the different organs of Leipzig's municipal administration (realising different interventions in the frame of the Watershed Connection project) can be expected to reflect the views of the different actors involved in the Green Ring in a very loose fashion only. The extent to which those interventions will not be met with opposition basically depends on how well the Municipality's officials involved will be able to correctly guess the perspective of the affected parties. The Green Ring helps them in this very little. The voluntary and non-binding character of the available platforms basically restrict participation almost only to groups in favour of the project.

What the case suggests is therefore the following. The Green Ring performs little as a forum where alternative views on the Watershed Connection project can come together. The real contribution of the Green Ring to the project lies instead on the interface between the project and the general public. It namely provides a certain degree of communication and information disclosure and can this way increase the acceptance towards the project, lessening actual or potential opposition. The Green Ring is indeed very active on this side.

The project hasn't met any strong opposition yet, possibly suggesting that the Leipzig administration has indeed a good knowledge of its constituency's expectations and/or that the promotion campaigns of the Green Ring are effective. One has to mention, however, that several environmental groups strongly oppose the project and do not take legal action against it mostly for a lack of financial means.

Taken together, the last two points seem to confirm the insight gained from the Panke 2015 case: we see an administration acting cooperatively to a very little extent only (as suggested by the discontent of the NGOs) and would expect it to do the same towards its own citizens. We can indeed observe this if we consider the one-way performance of the Green Ring Leipzig as an interface between the citizens and the administration. Much to the contrary, in the following and last case we will observe a tension (and not a correspondence) between the internal (among participants) and the external (participants vs. public at large) interfaces constituting the participatory process under scrutiny.

2.2.6. The Werra Round Table

The last case focuses on the participatory process addressing the salinity issue in the Werra-Weser river basin. The river basin hosts salt extraction activities, providing jobs to nearly 10.000 households in Hessen and Thuringia and contributing to the operations of a global player on the fertiliser market, K+S, based in Kassel, Hessen. The solid waste produced by the extraction activities has several detrimental effects on the river's ecology and infrastructure. The current authorisation regime for the activity's waste disposal channels is not compatible with a good ecological status for the Werra/Weser, prompting a change of the current arrangements.

In order to identify a way forward, a round table has been established, involving a plurality of public and private actors across the five federal states involved. The process is highly formalised and designed in great detail. Participation is extended to nominated representatives of specific organisations, covering the four overarching interest groups: 1) public administration; 2) economy and employment; 3) environmental groups; 4) riparian communities. Participation is conditioned to the willingness to accept compromise solutions. Therefore, the goal of the Round Table is neither to protect the environment nor to secure the future of the extraction industry in the area but to identify a solution striking the best balance between the two.

Formally speaking, the RT is to produce a non-binding recommendation, which will be voted by the participants under secret voting and majority rule. The non-binding character, however, has to be regarded carefully: any decision output achieved without the unanimity preludes to a legal battle during its implementation. Substantially speaking, all participants have the substantial means to effectively oppose and halt whatever solution to the problem. This means that only those solutions that reach unanimity at the Round Table have a chance to be implemented. This circumstance requires a high degree of complexity for any new arrangement seriously taken. It is possible to appreciate this by taking a closer look at the specifics of the situation.

The extraction activities produce roughly 14 million tons solid waste every year. K+S currently relies on three channels for waste disposal: salt heaps, injection into the underground and discharge into the Werra. Shortly downstream of the extraction facilities, the Werra joins the river Fulda and together they constitute the Weser, flowing into the North Sea. Even in the coastal city of Bremen, roughly 400 kilometres downstream of the extraction facilities, the increased salinity of the Werra is not negligible. This is so despite the salt-free water input of the two major rivers Fulda and Aller.

The Werra-Weser watershed crosses the former boundary between East and West Germany. In the 70s, the extraction was so intense that the river's salinity was higher than that in the North Sea. Back then, the international dimension of the problem made it impossible to tackle the issue. Today's situation is by far milder. Nonetheless, salinity is far too high for a healthy water ecosystem to thrive and is sufficiently high to provide damages to the river infrastructure, encompassing bridges and hydropower facilities.

The direct discharge of salt into the river is not the only problematic disposal channel. The 500m high salt heaps constitute an element of disturbance in the landscape and are believed to cause air quality problems. This is due to the dusts carried away by the wind. The practice of injecting the salt waste into the underground has caused the dismissal of several groundwater pools for drinking water purposes. Finally, both practices represent only a partial alternative to the direct discharge of the water into the river. The rain weathers down the salt heaps, creating salt-rich runoff, while the underground layers haven't proven as water-tight as they were believed. The water pumped into the underground enters the groundwater streams and re-emerges somewhere else, flowing finally into the Werra.

Given the above, the stake is not only the good ecological status for its own sake. The extraction activities also negatively affect dimensions such as air and drinking water quality for the residents in the proximity of the extraction facilities. Only some of them belong to those households directly or indirectly working for K+S. We also have a downstream fishery sector negatively affected by the extraction activities. The same applies to those in charge of maintaining the abovementioned infrastructure.

Furthermore, there is the legal position of those upstream environmental authorities that have granted the extraction authorisations in the past. The authorisations were based on knowledge which has now proved wrong (e.g.: effects of the injections into the underground, effects of the salt heaps). Reiterating the same authorisations may expose upstream officials to adverse legal consequences. One also has to consider that only two of the five involved state administrations host the facilities of K+S. The remaining three only have a share of the environmental harm without any visible gain. This drives a wedge between upstream and downstream state administrations concerning the consequences of the authorisation process.

Finally, the profitability goals of the company may not be compatible with its performance in terms of employment. On the one hand, the investments necessary so as to achieve a higher degree of abatement may prevent the company from fulfilling its obligations towards the shareholders. On the other hand, an insufficient amount of abatement may cause the company to cease operations in the area altogether, maintaining the company's profitability (as it has other facilities elsewhere in the world) but losing employment. This perspective drives a wedge between the interests of the company's management and that of the industry and employers' associations.

The participants of the Round Table are representatives of all the above mentioned groups. Their task is to review all feasible options and provide a recommendation that reflects the best knowledge available. They do so by meeting almost on a monthly basis, either in plenary or in smaller working groups with a thematic focus. They also commission studies and technical assessments, so as to verify the validity of specific claims. The Round Table can furthermore rely on an internal technical support for scientific matters and on a secretariat for administrative aspects of its work. The latter plays a key role on the interface between the Round Table and the general public.

The Round Table has tight rules concerning information disclosure. None of the participants is allowed to disclose the contents of the discussions, in particular the positions of the individual participants. This is so in light of the confidentiality status of some of the topics discussed. It also has the rationale of creating trust among participants and let them discuss freely and openly. The contents of the meeting are

then communicated to the outside via the publication of the minutes, in a reviewed form approved by all participants, drafted and made available on the internet by the secretariat.

The communication policy and the focus on scientifically sound knowledge explain, together, the current developments at the Round Table. A premise is that uncertainty is pervasive in environmental sciences. The process relies on the fact that, as soon as knowledge gaps between the actors will be cleared, the best possible solution will become self-evident. Uncertainty on environmental matters is however not a question of lack of knowledge but a question of incompatible truth claims. This means that it's not the availability of specific pieces of knowledge that makes the difference, it's their (normative) acceptance. The process has struggled with the fact that knowledge on specific key-issues is sufficiently soft for actors to dismiss even the conclusions of the expert assessments. This has impeded the achievement of consensual arrangements.

Furthermore, not all what has been discussed at the Round Table is capable of being communicated to the general public. This holds in particular for those conclusions relying on soft knowledge or on group dynamics among the participants. This seems to have brought certain participants to positions they can hardly communicate to their home organisations. At the moment the process has delayed its decision output for about six months. The official aim is to bring clarity concerning certain aspects of the specific interventions that will be part of the recommendation. The recommendation will unavoidably foresee a package of different interventions over time and the question seems now to focus on the relative weight of the different measures.

What the case suggests is that the reliance on technical, objective knowledge is not sufficient for decisions of this kind. Specifically, we can consider satisfactory outcomes of similar decision process as the achievement of decision outputs that do not prelude to a legal battle and/or to acts of sabotage within or outside the law. Scientific soundness is apparently not able to guarantee similar outcomes unless it can rule out complexity and achieve unchallengeable ultimate proofs. To the extent it doesn't do so, knowledge is left to represent only a part of the necessary elements for a broadly satisfactory arrangement to exist – the rest being values. The current

struggles faced by the process at the moment seem to be explained by the shortcomings of the process design in these respects.

The implications for process design are the following. Participants are in the best position to tap into the knowledge held in their respective organisations. They have however very little possibilities to determine the way this knowledge will affect the response of their groups. Here lies the link to values and the aforementioned tension between the internal and the external interfaces of the process. In formal terms, the process at hand helps them very little – due to the communication policy and due to its reliance on (unavoidably soft) scientific evidence. Side-talks may be necessary so as to get certain messages across. Though, this would be in breach of the very own transparency objectives of the process.

Participants can report back on particular insights gathered during the discussions at the Round Table. This may however justify a change of position only in part – the rest depending on aspects which are either off limits (because confidential) or too contextual (because depending on group dynamics among the participants). This circumstance calls for an exploration of the actual role of information as determinant of the participants' choice of a new arrangement for the Werra. An interesting hypothesis may be that the softer the information supporting the new arrangement, the likelier the new arrangement will incur in opposition from the groups represented at the Round Table, unless side-talks are able to change their position off the record[4].

2.2.7. The Workshop on Participation in the implementation of the European Water Framework Directive

Exception made for the Krebsbach case[5], individuals in charge of the process design from all the cases above have been invited for a workshop we held at our home

[4] That is, by leveraging information which is not part of the official discussions at the Round Table as they appear on the minutes.

[5] The case has been excluded for matters of time constraints. As the guests did not know each other's case, four was considered the highest number of cases that could have been presented in the course of a four hour workshop. A longer workshop was not considered feasible due to travel times and work obligations of the

institute, the Helmholtz Centre for Environmental Research in Leipzig, Germany. The workshop took place in the frame of the project's dissemination objectives and was held on November 19, 2009. It focused on the potentials of participation for the implementation of the European Water Framework Directive. As practitioners mostly from public administrations, the guests were given the possibility to share their experiences with participation in their respective cases and beyond. The idea was to identify lessons for the implementation of the Water Framework Directive on the basis of their experiences with the cases described above.

The workshop was structured as follows. The guests held short presentations on the processes at hand. They were explicitly asked to focus on the constellation of actors involved and on how actors got together so as to take the decisions characterising each individual case. Subsequently, an introductory exercise took place, so as to stimulate discussion. The exercise was based on recent work by Ortwin Renn, Professor at the Stuttgart University and part of the GoverNat project. The exercise exposed the guests to 6 different ways of understanding the rationale for participation (see Renn 2008).

Before being exposed to the concepts, the guests had written down a few notes capturing how they understood the goal of participation in their own cases. They were subsequently asked to identify the concept of participation in which they most recognized their own. In order not to undermine trust between the guests and the organisers of the workshop, the notes were not collected and double-checked. Based on the rehearsal of the workshop and on the suggestion by Renn's co-workers, the different concepts were re-labelled, so as to avoid biases caused by the label's political resemblances.

The guests could state openly which concept of participation they identified as closest to their own understanding and why. A second round was made with the opposite question: what would fit the least with the particular cases? The two rounds served as a springboard for the discussion that followed. The core points of the discussion are summarised below.

guests. Among the cases, the Krebsback was the one with the weakest link to the Water Framework Directive and was therefore sacrificed.

Point 1: Good decisions and acceptance

All participants recognize themselves in a mix of two particular concepts. For them, the goal of participation is to exchange information across actors so as to achieve a decision of good quality. It is understood that a good quality decision is an informed one. An equally important goal of participation is also that of giving everybody the possibility to raise concerns, even though it is clear that not all concerns will possibly be integrated in the decisions. The important point is to be able to openly address all of them and to be transparent concerning the way they are rejected or integrated. The two aspects together shall ensure that the decision is structured in an appropriate manner: that is expected to produce acceptance. Acceptance appear to be ultimate goal for organising participatory processes. Instead, emancipatory interpretations of it have been dismissed by the guests.

Point 2: Different actors and different interests

The diversity of actors and interests in a specific setting is an important factor making participation necessary. Understanding this diversity is a difficult psychological endeavour. It is however crucial for identifying the actual points of friction in the definition and realisation of the decisions at stake. It is equally important to communicate that a similar efforts are being made. Regardless whether specific concerns can or cannot be taken up, showing that they are sought after and taken seriously is already in itself a contribution towards a better acceptance of the decisions and a lowered degree of confrontation and conflict.

Furthermore, engaging in similar processes in a timely manner can prevent conflicts from escalating if the point of frictions are identified ahead of time and the affected parties are put in a situation where they can participate to the decision constructively.

Point 3: Participation and voluntariness

A second factor calling for participation is the lack of instruments for an authoritative implementation of the Water Framework Directive. If one even wanted to achieve a good ecological status in the complete disregard of participation, implementing the

necessary measures would in most case require legal instruments that are currently not available. The achievement of the Directive's goals must therefore set on voluntariness and here is participation crucial.

Point 4: Degree of abstraction vs. room for decision-making

There is a trade-off between accessibility and openness in different phases of the process. With reference to the Water Framework Directive, room for decision-making is mostly available at the stage of the definition of a Management Plan or of a Programme of Measure. These are phases where decisions are still open and there is room for substantially different alternative choices. These phases are however characterised by a high degree of abstraction, so that accessibility is low. Simple matters of understanding prevent actors to engage in the process at this stage.

At the level of the specific measure, things are symmetrical. The degree of abstraction is low. This implies that actors can clearly see the terms of the decision. Affected parties also see clearly what implications the decision has for them, so that they now can take action. At the level of the concrete measure, the room for decision is however very little and seldom includes a do-nothing option. The decision is taken already and there's no way back. This implies a changing role for participation. While at the planning level, it can contribute inputs and shape the decision, at the level of the measure it has the only role of creating acceptance by skilfully communicating the terms and consequences of already made decisions.

Point 5: Environmental education for the mid- and the long-term

Knowledge is considered an important factor in determining both the actors' willingness and ability to participate in decisions and their understanding and acceptance for measures and prior decisions. A knowledge gap is perceived and environmental education is seen as an important tool for filling this gap. A higher level of environmental education today may ease the tasks of implementing water management tomorrow, particularly in the light of the previous point.

Point 6: Bottlenecks for the administration

The means currently available for administrations to provide a broadly participatory implementation of the Water Framework Directive are seen as inadequate. This is particularly so because participation requires a high degree of (personal) involvement. Engaging in a decision process that involves so many and so different actors and affected parties is not considered feasible with the regularly available capacities. Furthermore, administration officials usually do not have the necessary competences, particularly concerning mediation and communication. Officials have often to improvise on these respects and can rely on very little training opportunities.

A second hindrance lies in the organisation culture administrations are built upon. Public administrations constitute hierarchies and function as such. They regularly reward hierarchical behaviour and sanction autonomy and thinking-out-of-the-frame. Administrations embody a way of thinking which is antithetic to participation. It's no surprise that they have difficulties with organising and taking advantage of participation.

2.3. Outcomes and implications for the thesis

The materials presented above suggest a few things for the set-up of the thesis's conceptual model. We address each point individually.

1) Administrations differ widely. What we here intend to stress is not simply that administrations may differ from one another (e.g.: approach of the Berlin vs. Brandenburg administration to the Panke project; upstream vs. downstream state administrations in the Werra case). We rather want to stress that administrations differ also internally (state-level vs. local level in the Brandenburg administration; presence and role of the steering group in the Leipzig case; Steering Group in the Berlin administration; public water operator vs. authorising agency in the Krebsbach case). Therefore, it may be wise to set up the analysis in such a way that administration bodies are present at the same level as every other participant. This

would allow for their internal diversity of interests to be acknowledged. It would also reveal those internal systems (including hierarchy) normally in place so as to process and deal with such diversity.

2) Knowledge and information vs. interests. All cases acknowledge that actors hold diverging interests. They also all rely strongly on the power of information and knowledge in creating acceptance, as if conflicting, incompatible interests were only or mainly so as a product of missing/wrong information. Acceptance is understood as the contrary of opposition. It seems that information can make a difference at least concerning certain actors' interest in opposing specific developments. It may be convenient to set up the analysis in such a way that clearly links interests, knowledge and action/choice. A way of doing this could be to read the narratives from the different cases as the clash among different perspectives.

3) Clash of perspectives. Approaching the decisions at stake as a confrontation process between alternative perspectives offers a more nuanced take on the information issue raised above, together with a clear and straightforward link to different and incompatible interests. It may be convenient to set up the analysis in such a way that explicitly addresses the dynamics between individual perspectives. One can do so by focusing on the arguments exchanged and modelling the factors comparatively determining their persuasiveness and their ability to be taken up. Within the cases, suggestions in this direction are plenty (e.g.: scientific soundness in the Werra case; flood protection in the Krebsbach and in the Sprotte case; role of the private consultant in the Leipzig case).

4) Plural rationales for policies and interventions. Shifting the analytical approach from information to alternative perspectives on "what is best" has also the potential to clarify questions concerning the "functional needs" of specific interventions and policies in watershed management and governance. From certain perspectives, specific policies may appear inconsistent with their own explicitly stated objectives. To the extent that missing information explains those inconsistencies only in part, room is there for speculations on different, alternative, possibly "true" rationales behind the same seemingly inconsistent choices. It may therefore be convenient to approach the analysis in a way that is methodologically able to cross-check interests and positions of the actors at stake.

We can now link these points of interest to the research questions formulated at the end of the previous chapter. RQ4 reads as follows: “By which means and processes did actors communicate and interact so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference?”. The above suggests that the relevance of the way we approach our research for the cases above can be ensured by:

- identifying and cross-checking the different interests at play;
- defining actors in such a way that avoids aggregation, so as not to lose information on internal conflicts of interest;
- establishing a link between interests and choices;
- clarifying the role thereby played by information/knowledge;
- modelling the determinants of the uptake process of that information/knowledge.

Once we have modelled the determinants of the uptake by individual actors of specific pieces of information/knowledge among competing ones, we will be able to establish a link between the process design choices and the way different perspectives are integrated (or not) into a rationale and further formalised into a decision output. That decision output will imply a specific distribution of entitlements and obligations among actors. By linking the different perspectives to the different groups at play, we will be able to connect the components of the social context at play to the chosen distribution of entitlements and obligations among them. The link between the two will be constituted by the characteristics of the decision process at play, hence by matters of process design.

The following chapter provides an exploration of the Economics literature relevant to our research question. We will then try to answer the question by building a

conceptual model based on the insights from the literature and by applying it to the materials obtained from a specific empirical case. A certain degree of arbitrariness is unavoidable when building a conceptual model. At that point, the outcomes of the case review presented in this chapter will allow us to ground at least part of the choices underlying the construction of the model in the observations presented above.

Chapter 3 – Literature review

Sections: 3.1. Environmental and Welfare Economics; 3.2. Transaction Costs Economics; 3.3. New Institutional Economics; 3.4. Law and Economics; 3.5. Institutional Ecological Economics; 3.6. A critical reflection.

Chapter 1 has produced a set of research questions drawing both on literary references and on “common sense”. It has thus identified a broad field of interest and has narrowed it down in a normative and, to an extent, intuitive way. Chapter 2 has instead located the present work into its research context and has derived insights from a diverse set of empirical materials so as to provide directions and further support for theory-building. Goal of Chapter 3 is now to draw insights from the literature covering RQ0 to 4 and thus produce directions for the analytical framework we’ll spell out in Chapter 4.

Before we turn to the literature review, some clarifications are due. RQ0, targeting the way participation affects the state of socio-ecological systems, allows for a certain restriction of the disciplinary dimension of the work by focusing on particular objects of study. As soon as these objects are defined, it quickly becomes clear that RQ1 to 4, involving the economy, entitlements and obligations, the public/private divide and distributive matters, call for a strong interdisciplinary approach. Ecological Economics itself may be understood as the unification of Ecology and Economics (Faber 2008). The interdisciplinary dimension of the present work goes however in way more directions than these two disciplines, so that an integration of the two fields will not exhaust the required disciplinary contributions.

We face a prohibitive amount of literature to review: Economics, Ecology, a varying combination of basic natural sciences according to the specific empirical material chosen, Public Administration Studies, Political Sciences, Law, just to mention a few. On the other hand, the more specific and thus selective one becomes, the more sector-oriented the research: the integrative effort emerging from Chapter 1 would then be lost.

There is here a dilemma between broadness and depth of analysis – an old problem that won't be solved herewith. We go around it by giving up exhaustiveness. We will not review and integrate literature so as to exhaustively cover all related fields and disciplines. Instead, we take a field of reference and its present degree of interdisciplinarity for given and work out its interfaces with other disciplines so as to answer the research questions at hand. This approach translates into a simple practice: to start with one's disciplinary background and make assumptions explicit, allowing other scholars to further develop specific elements at the boundaries of the analytical framework thus produced.

We will take Economics as a starting point simply because it's the background that we have. Certainly, modern Sociology would work out certain parts of what we have set up in very different ways. Same goes for all other disciplines mentioned above. To explore them all and integrate them consistently is hardly possible within a doctoral dissertation. We will therefore look for Schumpeter's "non-economic bottom"[6] in the several sub-braches of Economics that we will take as a reference, so that colleagues from different disciplines know where they can contribute to the analysis we set out to provide.

Summarising, the present chapter presents a review of the Economics literature providing clues for at least RQ0 if not for RQ1 to 4. Specific perspectives from Environmental and Resource Economics, Transaction Costs Economics, New Institutional Economics, Law and Economics, Experimental Economics and Institutional Ecological Economics will be presented for what they may contribute to an understanding of the research questions. The subsection concludes with a critical analysis and opens the floor for the crafting of an analytical framework.

3.1. Environmental and Welfare Economics

Economic scholarship has developed a dedicated branch dealing with resources and nature: Environmental Economics. As such, this specific subfield of the profession addresses RQ1 (dealing with the link between Ecology and the Economy) from the

[6] J. Schumpeter (1934) Theory of Economic Development, p. 5. Quoted in Bromley (2008), p. 3.

point of view of optimizing production factors, nature being one of those. More specifically, the branch addresses the question of achieving an efficient allocation of individual environmental features. Efficiency represents here the exhaustion of improvement possibilities at either individual or aggregated level. The comparison between the individual and the aggregated level shows the branch's root in Welfare Economics.

The core issue that has spurred the development of this branch as an autonomous one is that "the market", the superior allocation system from the point of view of most Economics, is not necessarily present and functional when dealing with nature. This is so for a series of reasons widely contested in the literature and to an extent bordering with Institutional Economics and Transaction Costs Economics. The header under which this is discussed is that of "Externalities" or "Market Failure".

Introducing Externalities, we refer to the body of literature concerned with the problem of social costs (Pigou 1932; Coase 1960; Buchanan 1969), hence those costs originating from a specific activity but falling on third parties. Since "the invisible hand doesn't work" (Kahn 2004, pg. 19) in the presence of externalities, regulation is required as private, individual bargaining by a multiplicity of actors does not produce, alone, an allocation of resources that maximises the overall utility.

Two major schools of thought exist in the way Environmental Economics deals with a similar setting: the Pigouvian and the Coasean one. The first proposes a targeted use of taxation. The second endorses a laissez-faire approach centred on the ability of the actors to efficiently bargain towards an efficient outcome. Common to both schools is the reference to Pareto efficiency as a choice criterion, together with the view of a regulator as a well-meaning actor, whose aim is to maximise the overall well-being of society.

Under these premises, the task for an hypothetical regulator is that of devising arrangements dealing with externalities in such a way that those worse off are less so than those better off (potential Pareto improvement or Kaldor-Hicks efficiency). The debate between the two schools becomes thus relevant for RQ2 and specifically RQ2a, whose formulation focuses on the distribution of those entitlements and obligations, which set up the economy.

The entry point of the Pigouvian tradition is the divergence between private and social costs and its effect on the outcomes of a transaction. Costs are what one gives up to get things (Buchanan 1969, Mankiw 2009); if individuals exchange goods during a transaction (hence they give and take items according to some principle), a problem arises when some third party is affected by the transaction without participating to the decision behind it.

The third party may be affected positively as well as negatively by such additional costs/benefits: this doesn't change that, while taking these extra costs or benefits into account, the comparison of costs and benefits behind the transaction at hand becomes incomplete and hence perfectible. If this is the case, efficiency claims concerning the transaction must be dismissed: there must be room for improvement. The Pigouvian claim here is that by taxing the externality-generating transaction at a level that equals the costs it produces for the third party, efficiency can be restored.

From this point on, a clarification is due in order to fully understand the contribution of this branch of scholarship: the reference made so far to costs, benefits, utility and welfare goes along with the common-sense meaning of those words. While the further discussion of the topic has forced the profession to a certain degree of further differentiation and specification of these terms, the general tenet is that choices underlie a balancing of positive and negative entities that can be measured against a common metric. That metric is generally termed utility and often approximated via monetarisation.

The term welfare has been used and/or understood to an extent as a synonym of utility (Cooter and Rappoport 1984), raising however the question of commensurability across individuals or "interpersonal incommensurability". Prices, instead, presuppose an exchange situation and express a specific exchange ratio. Money is not yet necessarily involved in the generation of prices, it can however represent a *numeraire*, a generalised term of comparison used to express exchange ratios[7]. If so, one can talk of monetary prices.

[7] One can visualise the above by thinking of cigarettes in detention camps: as soon as no money circulates but goods and services are available (one way or another), some of those goods can be use as a general terms of reference when doing exchanges, for example cigarettes. Money would certainly have different properties in doing the same job, e.g. it doesn't physically decay as quickly as cigarettes do. On the other side, it seldom represents a good in itself.

Costs and benefits are variations in utility which may or may not be linked to transfers of money on the basis of prices. This is important, as the whole story hinges on the difference between the costs and the benefits considered while agreeing on a price (monetary or not) for a certain good or service (which we call a "private" transaction) and the broader bundle of costs and benefits that the transaction generates if the third party is considered (which instead we call an "aggregate" or "social" transaction, a transaction seen from the point of view of society as a whole).

The Pigouvian argument was made in pre-marginalist terms, in an environment, therefore, characterised by interpersonal commensurability of utility[8]: there are "external costs", seen as a quantification of the loss in utility experienced by the third party. Rather than representing some sort of compensation, a Pigouvian Tax is introduced as an instrument that drives a wedge into the private cost/benefit calculation so as to match the aggregated one and eliminate the divergence between private and social costs. The same argument has been shown to hold in a marginalist environment too, where only (relative) prices can be referred to as an expression of utility: efficient prices must include external costs, regardless of any compensation taking place (Baumol 1972; Hartman 1982).

The Coasean tradition, instead, focuses on the reciprocal nature of externalities (Coase 1960; Wirl 1992). The Coasean school has brought about a change in perspective by suggesting that the "problem" is caused as much by the transaction as by the third party. We may think of "abatement costs" as those costs stemming from specific efforts to curb certain externalities (e.g. mitigation activities, adaptation activities etc.). The suggestion thereby made by the Coaseans is that abatement costs may possibly be lower on the side of the third-party. If so, a Pigouvian Tax would not always restore efficiency: it would do so only in that subset of cases where abatement costs are indeed lower on the side of the transacting parties.

The Coaseans go however further: the asymmetry in abatement costs give rise to incentives for them to be efficiently allocated via further bargaining, this time between

[8] Enlightening on this aspect is the analysis by Buchanan (1969, chapter 5). On the broader relevance of marginalism for the concepts of welfare and utility, see the discussion in Buchanan (1969, chap. 1 on pain vs. opportunity cost) and Hennipman (1987, on material welfare as opposed to relative scarcity and interpersonal comparability vs. ordinalism).

the transacting parties and the affected third-party. Instead, a regulator can hardly know on which side the better abatement possibilities are. The Coaseans therefore argue that all it takes is to distribute clear property rights on the medium carrying the externality and a market would emerge, efficiently allocating abatements costs against the benefits of additional units of the (now fully internalised) externality. This is the essence of the (invariance claim of the) Coase Theorem.

The theorem has clear limits, which have been dealt with by Coase himself (Coase 1988) and that have led to different readings (Baumol 1972; Bromley 1989; Medema 1998; Paavola 2007; Usher 1998; Vatn and Bromley 1997). The message, particularly for what concerns RQ2, is nonetheless that it's preferable not to regulate the extent of activities shifting costs onto others but rather to make an informed choice on the assignment of extensive property rights, covering possible externalities and leaving the parties involved bargain towards an efficient level of external costs.

At the level of RQ4, instead, this literature recommends individual market transactions in perfect competition as the preferred means and process so as to distribute entitlements to and obligations towards the features of a given ecosystems. While Standard Economics focuses on the outcomes of similar transactions, a sub-branch of the profession known as Transaction Costs Economics focuses on this typology of interaction from the side of its process dimensions. To that now we turn.

3.2. Transaction Costs Economics

The concept of transaction costs is important in Economics. It somehow resembles the concept of friction in (Newtonian) Physics, both conceptually and for the role it plays in modelling other phenomena. As much as basic Physics describes the motion of corpses in the absence of friction, Economics often models the economy as if markets were costless to run. This is relevant for us, since a common criticism to the findings of the Coasean school mentioned above is that they apply only to the extent that no transaction costs are involved, making the assignment of extensive property rights feasible (Williamson 1985).

As Joseph Stiglitz recently put it[9], nobody would build an airplane as if friction would not exist. Similarly, for an understanding of economic matters it is necessary to grant due attention to those efforts put into realising the *necessary preconditions* for the economy in general and for markets in particular. The concept of transaction costs encapsulate all this: it points out that even at the micro-level of the private transaction, a further array of costs plays a role in enabling the transaction altogether, regardless of its outcome and of the costs and benefits it balances.

Efficiency claims concerning specific transactions may have to be dismissed in the presence of transaction costs. Point in case is the very same Coase Theorem and its reliance on private initiative. Private transactions may restore efficiency whenever an externality emerges, provided property rights are attached. If however the number of individuals on either size increases, the degree of coordination necessary for them to enter the transaction at stake becomes intuitively more and more costly, potentially surpassing the very same gains from the bargain at stake.

If abatement costs on either side do not get to be compared with one another (via a transaction) because of transaction costs, they cannot and will not be efficiently allocated via private initiative. With or without property rights assigned. Here is already an insight for the link between the set-up of an economy and its ecosystem (RQ2b): certain economic activities may relate to the state of the ecosystem in complex ways, involving a multiplicity of ecosystem features playing out on a possibly heterogeneous plurality of third parties; to the extent this is so, these activities are unlikely to be set up in ways that fully account for that. This is due to the transaction costs involved in taking all this into account. A similar insight represents a special case within Williamson's broader Discriminating Alignment Hypothesis (Williamson 1979), a central tenet in Transaction Costs Economics.

Transaction Costs Economics is the branch of Economics dedicated to the study of transaction costs. As a premise, it is important to understand that such field has developed with a focus on industrial organisation, not on environmental matters. With this picture in mind, the intuition behind Williamson's Discriminating Alignment Hypothesis is that the characteristics of specific (governance, institutional) arrangements are likely to be in line ("aligned") with the complexity of the transaction

[9] Interview on Swiss Television (SF1, *Sternstunde Philosophie*), September 14, 2008.

they frame. This is intuitive. The novelty is however that dimensions are put forward for the characterisation of the complexity of the transaction at stake, namely: *asset specificity*, *uncertainty* and *frequency*. Such characterisation may or may not apply to environmental matters. The Discriminating Alignment Hypothesis is however valuable from the point of view of RQ2 in that it sets up a dynamic link between particular characteristics of the object to be allocated (via the transaction) and the characteristics of the coordination method.

We witness here a qualitative change from the externality literature mentioned in the previous subsection. Scholars dealing with market failure have explored in analytical terms the superiority of a specific arrangement (trade in externalities/abatement efforts) as opposed to another one (top-down rationing of entitlements/abatement levels) given a particular way of modelling a certain (eco)system feature (e.g. Baumol 1972; Berliant et al. 2002; Caplan and Silva 2004; Graff Zivin and Small 2003; Hartman 1982; Henderson 1977; Kohn 1977, 1991, 1994; Mills 1979; Rubio and Casino 2001; Terrebonne 1995; Xepapadeas 1995). Instead, the Discriminating Alignment Hypothesis explores a criterion as a function of which arrangements may be set up.

Given a certain model of how individual or group agents can or cannot interact (transaction costs representing a “friction” therein), the focus shifts towards a characterisation of the object of coordination as an independent variable affecting the dependent variable “governance structure”. Certainly, in order to fully appreciate the relevance of this change in paradigm, it becomes necessary to open up the concepts of governance and institutions. We do so in the following subsection. Before that, we intend to concentrate on the characterisation question emerging from the Discriminating Alignment Hypothesis.

We set up the stage by turning for a moment to “The Nature of the Firm”, another major work by Coase (1937). In that context, the question posed is why, if markets are costless to run, one can observe the existence of large, vertically integrated corporations (“firms” in Coase’s terminology). The question posed by Coase is one of make-or-buy: if a market is a precondition for allocative efficiency, the vertical integration of a corporation constitutes a source of inefficiency in that it replaces markets with hierarchies and hence voluntary, well-informed trade with top-down, ill-

informed rationing. Specifically, allocation ceases to be dealt with by matching demand and offer based on competition among potential contractors and/or clients (as in a market) and becomes a matter of command within a principal-agent relationship (as in a hierarchical situation).

A key in understanding this point is the concept of economising. We can intuitively understand it as a tendency to cost-saving: efforts, hence costs, constitute a detrimental aspects of choices, which it is generally desirable to reduce and/or minimise for a constant output. Given this generalised tendency of individuals and groups to do so, the answer Coase envisions and Williamson later on specifies is that, under certain circumstances, a hierarchy may have an edge over a market from an economising point of view. The question is to characterise such circumstances.

Williamson's contribution here has been to highlight the economising role of what he terms *asset specificity*, *uncertainty* and *frequency* of a transaction. These three dimensions basically allow the analyst to adopt an economising rationale while drawing the line between different governance forms, differing from one another in "discrete, structural ways" (Williamson 1999, p. 313) and ranging precisely from unconstrained demand-offer-like market transactions to hierarchical, principal-agent relationships.

In Williamson's perspective, governance forms specifically differ in terms of what kind of "support" is laid upon otherwise "unassisted" private transactions. The specific assistance thereby needed concerns the possibility for a contract between two or more parties to include all relevant dimensions of the objects being allocated. Asset specificity (k) provides thereby a first dichotomy: if specific investments are not needed, asset specificity being nil (k=0), contracts need to allocate their core object only. If this is not the case (k>0) the business risk associated with the investment in specific assets must be allocated too.

A second dichotomy deals with the uncertainty (s) connected with the ability of the market to reflect similar risks in market prices (k>0, s=0) or not (k>0, s>0). In the latter situation, a market transaction needs additional assistance in terms of "bilateral contractual safeguards" in Williamson's terminology. Bilateral contractual safeguards replace the bureaucratic costs of assessing and communicating a similar risk across a comparably anonymous market. They can therefore be seen as an economising

solution. We enter here a hybrid arrangement embedding a cooperative element (the contractual safeguard) in an otherwise market-like transaction.

A third dichotomy emerges from the frequency (f) factor: to the extent a transaction is characterised by positive asset specificity and uncertainty (k>0, s>0) a distinction can be made between a one-off transaction (f=0) and a repeated one (f>0). The hybrid contracting above applies to the former case; for the latter one, vertical integration offers economising possibilities via internalisation: to the extent that ownership is shared, no additional effort is needed for the allocation of the contractual risk (Williamson 1985).

From the above, we can already draw an important lesson for RQ2: physical circumstances may affect the choice of a specific arrangement for what they imply in terms of interaction among actors, as implicit in the focus on transactions. Asset specificity, uncertainty and frequency all have a physical dimension. If we interpret different forms of “contracting” between actors as different ways for them to interact with one another, the value added of the perspective Williamson offers us is that we may be able to narrow down the characterisation of the physical dimension of the choice at hand to a few elements and possibly forecast what kind of arrangement actors would go for, provided they take an economising approach.

This being said, we are still far from environmental matters. A translation of the above for natural resource management has been provided by Birner and Wittmer (2004). Specifically, Birner and Wittmer build upon the contribution by Williamson in two respects: by characterising the costs different arrangements can economise on and by further specifying the Discriminating Alignment Hypothesis for environmental matters. Furthermore, the make-or-buy perspective that underlies Coase’s and Williamson’s inquiries is translated into a question of delegation/devolution of management tasks from central/national state entities to private entities and/or local communities.

Birner and Wittmer introduce the concepts of *care intensity* and *contest intensity*, side by side with the abovementioned asset specificity, uncertainty and frequency. As opposed to industrial organisation, such concepts reflect the specificities of environmental matters and have their origin in the management of protected areas. Care intensity describes the extent to which a protected area requires repeated

maintenance and monitoring efforts, while contest intensity can be summarised as the degree of divergence in a particular social context concerning the use of the protected area of reference.

Both can give an edge to particular governance arrangements in economising terms. Birner and Wittmer help us characterise the terms of such economising advantage by spelling out a taxonomy of costs related to protected area management. Specifically, they conceptualise the different focus of production costs compared to industrial organization matters and proceed by isolate therein implementation and decision-making costs.

Production costs, when referring to the management of protected areas, refer to “the production of nature products and services, such as wildlife, biodiversity, or stream flow” (Birner and Wittmer 2004, p. 668) be it in terms of use (extraction, harvest) or non-use (symbolic value). In their perspective, costs emerge via the “drafting of regulations on competing resource uses, especially on agriculture, forestry, and fisheries by, for example, declaring protected areas to conserve biodiversity, or fixing rates of resource extraction for forest or fish resources” (Birner and Wittmer 2004, p. 669).

Decision-making costs incur, instead, through those transactions that are “necessary to make decisions” (Birner and Wittmer 2004, p. 669): they encompass all those efforts aiming at information gathering and processing (e.g., meetings). In an attempt to capture the trade-off between the effort of decision-making and its quality, Birner and Wittmer distinguish therein the costs of decision-making proper from the costs of “decision failure”, intended as those costs incurring from “the making of suboptimal decisions” (Birner and Wittmer 2004, p. 669).

Implementation costs capture those efforts necessary for the implementation of decision-making outputs. Specifically, care must be taken so as to ensure compliance towards the agreements and regulations which are the focus of the prior decision-making efforts. Similarly, implementation costs can be distinguished in implementation costs proper and implementation-failure costs, understood as the costs incurring due to damages causing a deviation from specified conservation goals (Birner and Wittmer 2004, p. 669).

On the basis of the Discriminating Alignment Hypothesis, the economising criterion put forward by Birner and Wittmer is that a specific governance form X is preferable to another one Y if the sum total of production, decision-making and implementation costs (including failure costs for the latter two) is lower for X than for Y (Birner and Wittmer 2004, p. 671). Asset specificity, uncertainty, frequency, care intensity and context intensity all affect the three cost categories positively, they do so however differently for the three governance forms envisioned by Birner and Wittmer (pure state governance, state-business hybrid governance, state-local community co-management).

Birner and Wittmer identify ranges where one governance form dominates the others in economising terms. They thus provide a specific lesson for RQ3, with implications for RQ2: to the extent that reducing the overall efforts is the criterion for setting the boundary between economy and ecology, trade-offs among production, decision-making and implementation may inform the choice of a suitable governance arrangement. Different governance arrangements can in turn be characterised with reference to their specific distribution of production, decision-making and implementation costs.

The latter point suggests a particular analytical approach to decision-making in socio-ecological systems. We can now deploy it while opening up the concepts of governance and institutions. In order to do so, we will now turn to the field of New Institutional Economics, a field deeply intertwined with Transaction Costs Economics, addressing the role of institutions in economic life.

3.3. New Institutional Economics

From the point of view of Transaction Costs Economics, certain preconditions must be met for economic transactions to take place and the economy in general to run. If this is the case, the question addressed by Institutional Economists is one of characterising the economy as a function of the arrangements set up so as to provide for such preconditions.

An example may clarify. As Ostrom puts it, even a competitive market is a public good (Ostrom 1990, p. 15): for it to run, several arrangements have to be made concerning its way of functioning prior to and independently from those demands and offers meeting within it. This means that even for the fish catch in the most remote and least complex island of the Pacific, some "preliminary" efforts have to be made before demand and offer for fish can meet (e.g. developing a currency, developing and establishing the idea that the fish belongs to those fishing it and the like). Such arrangements constitute a public good in that, once they are established, they benefit all actors in the market independently[10].

As a public good, such market arrangements are subject to market failure as discussed in the subsection on externalities. In market terms, those arrangements necessary for a competitive market to be set up are bound to be underprovided, if they are provided at all. The demand and the offer for those arrangements necessary for the market to run will be provided by some and benefit others: if looked at in market terms, they represent a bad deal. Yet, they are provided nonetheless. This observation raises a question. In which other terms must they have been looked at, so as to appear desirable from the point of view of those that have provided them?

Institutional Economics is the study of how societies could, at least historically, provide such arrangements. Classical inquiries such as that of Veblen (1899), simply find it hard to explain particular questions of consumption or labour division in opportunistic, economising terms. Consequently, they venture into exploring different rationales and other logics explaining them. Economic Anthropologists, for example, have long explored reciprocity as an alternative rationale to opportunism explaining the way specific economic arrangements establish themselves (Malinowski 1922, Mauss 1923-1924, Sahlins 1979).

Mancur Olson, similarly puzzled by the common good aspect of social arrangements, builds up a theory of groups that relies on "selective incentives", hence on benefits which are more private than others and allow for public goods to be provided even against expectations (Olson 1965). North and Thomas (1977), from the point of view of economic history, explore the shift from hunting and gathering to settled

[10] Technically speaking, establishing, for example, the custom of trading fish against shells benefits all buyers and sellers in the fish market. That benefit is non excludable (one can hardly be prevented from knowing that fish is traded against shells) and non rival (knowing it will not prevent others from knowing it as well).

agriculture. Their finding is that agriculture, rather then representing a more productive allocation of manpower compared to hunting and gathering, allowed for a transition in property regimes that changed the way humans looked at their labour, regardless of the change in productivity.

What all these inquiries and many others have in common is the manipulation of those “opportunity sets” constituting the individual basis for collective action. Here is where New Institutional Economics comes in, providing an understanding of institutions as societal constrains on individual economising behaviour. The idea is very simple: for the new institutional economist, individuals behave opportunistically by nature. It is acknowledged, though, that under certain circumstances widespread opportunism leads to lose-lose situations. In those circumstances institutions emerge so as to draw the line between situations in which opportunism is allowed and situations where it isn’t. Institutions, understood this way, can be considered historically grown “socially efficient” devices producing the common good under the assumption that “in the sum” the avoidance of the lose-lose situation more than off-sets the (opportunity) costs of preventing individual opportunistic behaviour.

As we will see further below, the logic underneath this approach is not free of caveats. Nonetheless, it provides an important stepping stone in approaching RQ2. We have namely distinguished cases where opportunism may be held to be beneficial from cases where this is not so. Respectively, there may be certain circumstances where socially efficient outcomes may be achieved via market-like arrangements while under different circumstances, instead, socially efficient outcomes must be achieved by other means.

The intuition behind New Institutional Economics is that we deal with two sides of the same coin rather than with a real dichotomy: the right set of institutions, by putting boundaries to otherwise unrestrained opportunistic behaviour by individuals, can allow them to achieve socially superior outcomes compared to those they would achieve in a situation of complete competition. In other words, by devising institutions skilfully, individuals can establish patterns of cooperation that constitute improvements in comparison to the outcomes that the same individuals would achieve without them. The analysis made by Ostrom (1990) on common pool resources is possibly the most groundbreaking application of this perspective.

Ostrom's analysis moves from the "Tragedy of the Commons" described by Hardin (1968) in the homonymous paper. Hardin's article successfully spread the idea that resources shared by a plurality of actors are doomed to be overexploited and disappear. This is the case for those resources, termed "common pool resources". For this kind of resources, individual resource units cannot be enjoyed by a plurality of individuals simultaneously (*rivalry*). Also, it is difficult for individuals to exclude others from the enjoyment of a given resource unit (missing *excludability*). For Hardin, it follows that individuals will tend to overexploit the resource because, lacking excludability, the fruit of every effort made so as to conserve the resource is bound to be reaped by someone else. Technically, the related opportunity cost cannot be matched by the expectation of a future stream of benefit. Many environmental resources find themselves in this type of situation. Ocean fisheries and climate issues are probably the two current most threatening examples of this sort of coordination problem.

The coordination problem raised by Hardin can be formalised in game-theoretical terms as a prisoner's dilemma. After showing that Hardin's findings depends on the specific mathematical treatment of the problem (particularly concerning the way payoffs are formalised ad what exactly counts as a payoff), Ostrom moves on to the ethnographic records of existing, long-lasting common pool resources around the world. She shows that self-interested groups of individuals were able to devise regimes of shared access that have lasted centuries. Ostrom's analysis focuses on the way pay-offs and sanctions are measured, on the way conflicts are resolved and on the way entitlements and obligations are distributed among self-interested, opportunistic users. By doing so she produces a characterisation of the institutions governing the commons, that, for the cases explored, were able to prove Hardin's prediction wrong.

Ostrom's focus is on rules for resource exploitation: she formalised her own approach in the Institutional Analysis and Development (IAD) Framework (See Ostrom 2007 for an overview). An exhaustive treatment of the IAD Framework, its elements and its evolution goes far beyond the goals of this section. It is however worthwhile to summarise some of its tenets:

- Relevant for a characterisation of the resource regime is the “Action Arena” where individuals interact both with the resource at stake and with one another on the basis of a blend of formal and informal rules;

- Rules can be characterised along with the ADICO format (Crawford and Ostrom 1995) on the basis basically of their generality ad of the presence of more or less specified sanctions (here one distinguishes rules proper, norms and sanctions);

- Rules come about in a nested, multi-tiered system, distinguishing an operative level (rules for resource exploitation) a collective-choice level (rules shaping the operative-level rules) and a constitutional level (fundamental rules determining the collective-choice level);

- Institutional bundles that have proved able to sustain Common Pool Resources over the long term contain rules on: 1) actors, 2) positions, 3) allowable actions, 4) scope, 5) choice, 6) information and 7) pay-offs; additionally (8), rules concerning the way resource regimes nest on one another can be present;

- Change, evolution, institutional diversity and flexibility play a key role for the longevity of institutional arrangements (Ostrom 2005, 2007, Janssen et al. 2007);

- The performance of institutional arrangements in use is conditional to the sharing of beliefs and information on the object and the workings of the arrangement itself (Ostrom 2001; Denzau and North 1994);

The above provides important clues at the level of RQ2. In particular, there is a clear link between RQ2a and RQ2b: Ostrom’s work does not only characterise rather closely those entitlements and obligations setting up resource use and hence economic activities (RQ2a), but also deals specifically with their distribution across actors and links them with the state (specifically: the long term survival) of a given ecosystem (RQ2b). Instead, what the IAD Framework does not provide in detail is a description of the dynamics taking place within the Action Arena and leading to specific arrangements.

Through the lenses of the IAD Framework we see the product of these dynamics and are able to characterise it. We see however very little about the process through

which individual actors interact so as to settle for a given arrangement and not other ones. This would be the object of RQ3 ("Following which concepts and criteria did actors distribute entitlements and obligations among one another (…)?") and RQ4 ("By which means and processes did actors communicate so as to identify a rationale for the distribution of (…)"). On this side, we can get some help by turning to Law and Economics and introduce those institutional economists who have explicitly dealt with the link between rules, deliberation and decision-making.

3.4. Law and Economics

On the side of Law and Economics, the work of Warren J. Samuels on the legal-economic nexus constitutes for us a stepping stone towards a comprehension of the mutual relationship between rule-making and distribution – that is, between the regulatory and collective-action elements an the rationing elements making up our research question and its several formulations. Samuels's staring point (Samuels 1971) is a critique of the dichotomy between the legal and the economic sphere in academia as well as in more general terms. Different domains resonate to the words polity and economy, both for the analyst and in one's life experience. Yet, so Samuels, this distinction is an artefact: a polity must take an economy for given to be meaningful, at least as far as interests and means are concerned; an economy, on its part, must also take a polity for given as far as at least a distribution of rights is concerned.

An analysis of politics that takes the economy for granted is a legitimate endeavour, at least as much as an analysis of the economy is legitimate that takes the polity for granted. The problem is that the findings of both are conditional to their ontological starting point and, as such, are inadequate for addressing the interactions between the two, thus dichotomised domains. Simply put, it would be inconsistent for an economist to address decisions concerning the distribution of property rights applying analytical devices that assume property rights being already settled. Similarly, it would be difficult for a scholar of politics to address the same decision with no reference to its effect on vested economic interests if those are assumed given from the start.

Samuels suggestion is to reject the idea that the two fields economy and polity have an autonomous, self-subsistent life of their own (Samuels 1989, pg. 1557). Instead, a consideration for the common field named the “legal-economic nexus” offers a more consistent analytical strategy for a description of “what is actually going on” (Samuel 2007, pg. 246, pg. 276. See also Samuels 1977, pp. 284-285). Modern terminologies would simply consider the two domains as co-evolving. However, no matter whether one adopts the legal-economic nexus terminology or opens up to a co-evolutionary perspective on the polity and the economy, the element that makes Samuels interesting from our perspective is that, in one shot, interests and rights are treated as variables. All the contributions mentioned so far took interests (phrased as preferences) for given and eventually debated the compatibility of pre-existing rights. Rights that “later on” are found conflicting.

Samuels rejects the view that rights are “found”, that there are pristine, original rights from which the economy rolls out autonomously. Instead, the economy would possibly reach its own Pareto-efficient configuration through market mechanisms starting on whatever set of rights. One could see this as a proof that the production of laws is a pre-ordered arena for the design of the economy, where the economy is a function of the polity and the polity is a self-subsistent domain. However, here is where Samuels analysis has an edge: the polity, intended as the arena for the production of laws whose function is social control and conflict resolution, thus becomes a field for bargaining and allocation as much as the market is. The polity becomes in turn a function of the economy – this from a strictly positive (that is: non-normative) point of view. Important for us is the difference between the two: the polity-as-a-market allows for a deliberative process of bargaining, while the market, at least in its ideal-type, doesn’t. This way, Samuels reaches RQ4 in one shot by depicting a legal-economic nexus involving a blend of deliberative and non-deliberative processes for conflict resolution.

Unfortunately, that is where Samuels’s analytical model presents its black box: he refers to the “use of government” as an instrument for the definition of what particular interests are to count in a decision (Samuels 1971, pp. 442-444). While reference is made to the operations of lobbyists, interest groups, to the particular role that judges have in the (American) common-law system, Samuels leaves us in the dark of the mechanisms through which deliberative and non-deliberative processes coalesce

and form a decision for the protection of a specific interest. In other words, Samuels account doesn't go as far as to explain why specific groups and not others where able to make themselves heard and have their particular interest count.

What we know from his narratives of court cases (in particular the 1928 court case of *Millers vs. Schoene*, involving apple orchardists and cedar holders in Virginia, US, upheld against each other by the spread of a parasite spreading from the latter tree species to the former) is that neither efficiency-based nor transaction-cost minimisation rationales can explain the decision at stake – as traditional Law and Economics would expect. The court at hand faced the decision whether to grant protection to a specific group and adjudicate the case based on the contested, newly issued law (L1) or to overturn it and adjudicate on the basis of the pre-existing legal statute (L2). Samuels (2007) discusses at length how an efficiency judgement of both options depends on the status quo chosen and is therefore normatively laden: no decision can be more correct than the other in absolute terms. The social context at stake was furthermore small enough that the transaction costs for an extra-judicial settlement can be considered negligible. The court cannot have chosen to assign the property rights to the side with minimum transaction costs, because they were likely to be negligible from the start.

The last observation doesn't only provide us with clues on how to answer RQ2a, dealing with the distribution of entitlements and obligations. It also sheds a new light on those insights gained from the Coasean school earlier in the text and encourages us to tackle RQ3 ("Following which concepts and criteria did actors distribute entitlements and obligations among one another, with reference to a specific ecosystem?") and RQ4 ("By which means and processes did actors communicate so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference?"). To do so, we will now enter Institutional Ecological Economics (and Experimental Economics) so as to be able to characterise "concepts and criteria" for decision-making and distribution and the way they are achieved with specific reference to environmental matters.

3.5. Institutional Ecological Economics

3.5.1. Setting the Stage

Ecological Economics represents a wide and diverse transdisciplinary endeavour aimed at exploring the nexus between human economies and the ecosystem. The present work locates itself within this field of inquiry. The prominent role this scholarship plays in the further deployment of this work will therefore come to no surprise. For the purposes of this review, we can safely narrow the focus to Institutional Ecological Economics, a sub-branch of scholarship that takes stock of the contribution of Institutional Economics and Transaction Costs Economics and explores their implications for environmental matters (Paavola 2007).

Before we can enter the institutional domain, we need however to introduce a few tenets that characterise Ecological Economics. As Chapter 1 already anticipated, Ecological Economics has emerged somehow in reaction to Neoclassical Economics in general and Environmental Economics in particular (see, for example Faber 2008). Ecological Economics represents an interdisciplinary, even transdisciplinary endeavour, so that no disciplinary and analytical dogma can be actually detected within the scholarly production that refers to this field, the related society, community and journals. There is in other words no set of ontological axioms or methodological approaches that unites all ecological economists.

This has the effect that, at least for some, Environmental Economics and its axioms concerning nature and society represent at best a special case compared to Ecological Economics. The authors we will introduce in the present subsection generally move their inquiries from assumptions to an extent opposed to those generally adopted in Environmental Economics. It is therefore necessary to introduce those assumptions and to stress how they differ from what has been portrayed so far. As anticipated in Chapter 1, these different assumptions concern both the human factor (in individual as well as in aggregated, social terms) and the characteristics of nature.

Concerning individuals and the social system, three main assumptions are brought forward: (1) incommensurability, (2) multiple rationalities and (3) imperfect knowledge. A fourth assumption focuses on the (4) interconnectedness of natural resources.

(1) Incommensurability refers to psychophysical states: variations in human conditions such as utility, happiness, well-being, pain, comfort are considered as not reducible to a common metric so as to allow for aggregation. Psychophysical states are herewith considered incommensurable within the individuals themselves (intrapersonal incommensurability) and, by necessity, across individuals (interpersonal incommensurability). Compared to the above, we hereby assume individuals who are not unambiguously able to clearly assess the net sum of all pro's and con's, of all positive and negative consequences of their choice.

Neoclassical Economics conceives of individuals who can make choices based on total utility as a criterion for ranking alternatives. Point in case here is the word "total", intended as an all-encompassing net sum. Utility is nonetheless considered incommensurable across individuals. This is the legacy of Marginalism in Economics (Cooter and Rappoport 1984). In order to fully comprehend the perspectives on institutions that we are about to introduce, it is necessary to keep in mind that incommensurability takes place already within the individual: Marginalism has it, that the utility an individual experiences from a certain amount x of a good X cannot be compared with that experienced by a different individual from the same x units of the same good X. Here we go further by stressing that the utility experienced by an individual from a certain good X cannot be unambiguously compared with that experienced by the same individual from a good Y. It may sound counterintuitive, findings in Neurosciences and Experimental Economics support however this thesis rather than its opposite.

(2) The assumption of multiple rationalities introduces, technically speaking, a pluralistic understanding of human motivation, that is, how individuals link information and values to action/choices. Standard Economics envisions a monistic or normative concept of rationality: individuals behave rationally and a rational behaviour implies certain patterns, all else being lack of rationality (translating into a-rational or irrational behaviours). A rational behaviour is one of consistent maximisation of individual expected utility, given the available knowledge on the options at hand. Few keywords may capture this: opportunism, self-interest, economising behaviour. This axiom is crucial in Economics as it allows the analyst to postulate a certain degree of optimality in the choices of the agents within specific economic models. What is more, it allows to structure expectations on the likely behaviour of "rational"

individuals on the basis of a series of positive and negative “incentives”. Prediction becomes a matter of solving constrained optimisation problems starting from the right parameters.

This assumption is released: given the same “incentives”, individuals may behave in ways which are structurally different. We can make this point clear by using examples from Adam Smith’s Wealth of Nations. Adam Smith’s butcher pursues his own self-interest, not generosity, in running his business. If rationality is multiple, the baker next to him may as well pursue the glory of the guild he is part of while making business choices. The point is twofold: first, we don’t know that a priori and therefore we don’t know what counts as an incentive for this latter butcher; second, a structurally different behaviour does not represent deviance nor it needs correction or advice.

Furthermore, the same butcher may structure his/her own underlying motivation in different ways for different spheres of life: the former butcher may pursue his own self-interest while doing business choices, yet he may as well be other-regarding while dealing with family issues. From a point of view of multiple rationality, this is neither irrational nor inconsistent. Again, this may sound counterintuitive but it is more in line with Neurosciences and with experimental findings than the standard account.

(3) Imperfect knowledge, finally, implies that individuals are seen as limited in their ability to gather and process information. Information plays an important role in economic models. Perfect information is often assumed, though incomplete and asymmetric information are also granted due attention. What is however not considered in standard accounts is the role of costly information in the sense of an individual’s limited capability to acquire and process information. This assumption is problematic as it basically stays in the way of individual utility maximisation. This is shown in Vatn (2005a, pg. 116-117). Beside the difficulty at theoretical level, it is rather commonsensical that individuals base their choices relying on a finite amount of information only.

Furthermore, information is treated here as a good which is basically capable of being accumulated, making it a matter of more vs. less information. No space is left

for issues related to contradictory, incompatible pieces of information. We'll enter this specific point while dealing with the production of Dan Bromley.

(4) Concerning the natural system, the core assumption standing out is that of the interconnectedness of natural resources. Environmental Economics applies to environmental matters conceptual models derived from (industrial) Resource Economics. These models generally deal with the optimal use or extraction rate of one specific resource, all else being equal. This is legitimate as an exercise in Mathematics but proves inadequate as a support for decisions in real-world situations, where environmental resources are characterised by complex systemic interdependencies.

The latter point needs not to attach to the assumption of imperfect knowledge mentioned above: regardless of the degree of knowledge assumed for the individuals or agents within a given conceptual model, Ecological Economics would tend to consider the resource on which the same agents act within its complex ecological context. This has a two-fold implication. First, resources become connected to one another in functional terms, so that the harvest of every resource unit is bound to affect, in turn, the availability of other resources. Second, these functional ties are considered known only in part and, possibly, ex post.

We thus describe a world characterised by radical uncertainty, where undesired outcomes are a pervasive phenomenon and represent the rule rather than the exception (Faber et al. 1992). We will now explore the implication this has on the distribution of entitlements on and obligations to given ecosystems and the resources they represent through the work of Daniel Bromley and Arild Vatn.

3.5.2. Daniel W. Bromley

Within the legacy of J.R. Commons, Dan Bromley focuses on those institutions stemming from parliaments and courts, including the process of crafting and re-crafting them. This is in line with the work of Samuels introduced above, though Bromley brings the analysis one step further as he ventures into the very process of crafting them. Institutions represent for Bromley collective action in liberation and

restrain of individual and group behaviour (Bromley 2004, pg. 79; 2006, pg. 31, pg. 37). They determine the range of options for specific choices and configure the opportunity sets for the individual taking a decision.

Applied to environmental matters, the above definition puts us already in the frame of RQ2, addressing those entitlements and obligations that draw the line between economy and ecology. A closer look reveals however a potential for insights into RQ3 and RQ4, dealing respectively with the concepts and criteria distributing those entitlements and obligations and extending to the process of settling for those criteria. New Institutional Economics sees institutions as constrains on a generalised human tendency towards opportunism. Opportunism – more specifically, economising behaviour – is thereby taken for given, so that individual choice becomes an act of necessity determined by exogenous parameters such as information and utility – information-dependent marginal substitution rates, to be precise.

Bromley, instead, considers institutions as the result of a process of "working out what is best" under given circumstances (Bromley 2004, pg. 84; 2006, pp. 78-80; 2008). This is an analytically very different position: from the point of view of New Institutional Economics "what is best" is fixed prior to and even in absence of a specific institution. For Bromley, instead, it is the institution that defines it. If the institution, distributing entitlements and obligations, comes devoid of any hint on what is best, it merely corresponds to a distribution of endowments, as if defining a staring point for a bargaining within an Edgeworth Box. If instead, as for Bromley, the institution is mostly about what is best (and then distributes entitlements and obligations accordingly), what we are talking about is the very shape of the contract curve within the very same Edgeworth Box, the starting point being secondary.

What we see here at play are the different assumptions concerning human behaviour and, ultimately, the human mind. New Institutional Economics approaches institutions assuming self-interested, opportunistic individuals, while here multiple rationalities and incommensurability play a role in making decisions problematic. Bromley's standpoint on these issues is not much buttressed by experimental finding but rather relies on philosophical Pragmatism. Two aspects are crucial for an understanding of Bromley's use of Pragmatism in explaining institutions: reason and belief.

Reason is different from cause. The difference between the two is the same that passes between necessity and intention. We can clarify: A stone falls because of gravity, meaning that gravity is the cause behind the stone's fall. An individual may as well choose course of action A instead of B because that is what maximises his or her total expected utility. Instead of reading out of it that utility is the cause behind the choice for A and against B, Bromley would read that the maximisation of utility, given certain beliefs on the utility promised by A and B respectively, is the reason behind the choice. One reason out of many and, most of all, a reason emerging from a discursive process of "working out" what is best in that specific situation.

This apparent subtlety has powerful implications for the Economics profession. It basically makes efficiency reasoning biased towards one specific kind of reasoning (maximisation of utility) and towards the status quo (as comparative efficiency requires unchanged preferences). Furthermore, it relegates market mechanisms to a minor role as they do not foresee any process of working out reasons for choices – similarly to what we have already found in Samuels.

A second important point in Bromley's theorising is the one concerning belief. A central tenet in his account of Pragmatism is that of collective reality construction through experience. Starting point is the realisation that truth is not an attribute of things but rather an attribute of statements about things (Bromley 2008, pg. 8). Individuals collect "impressions" of the world around them and structure those impressions into "reasonable beliefs" about what is and what goes on out there. For individuals then to act on the basis of those beliefs, three more conditions must be met. First, the belief must be "warranted", in the sense that it must express the consensus of an authoritative epistemic community. Second, a given belief must be "valuable" to the one holding it, in the sense that it must give rise to courses of action with positive outcomes. In other words, "bad news" are likelier to be dismissed as unreasonable beliefs than "good news" are. Third, it must provide relief from "doubt and surprise", meaning that it must address those aspects of a given arrangement that are found "wanting".

Again we deal with apparent subtleties which however bear strong implications for Economics and for the analysis of particular choices and decisions. A few things are accomplished by treating information in terms of beliefs. One is that information

availability is downgraded from sufficient to “merely” necessary condition. Another thing is that a dynamic element is introduced that goes beyond the emergence of “new” information and that is characterised at a far deeper level. Finally, a similar conceptual model can accommodate and process competing truth claims – a *leitmotiv* in environmental matters.

We can appreciate the importance of these two points through a comparison with New Institutional Economics. For the New Institutional Economist, individuals take decisions based on available information, while institutions change whenever new information (including new technologies) shows inefficiencies in the current arrangement. The fact that the same available information may contain holes and contradictory aspects is not dealt with or, at best, is assumed already sorted out. This means that whenever decisions present contradictory aspects within the available information, the conditions postulated by New Institutional Economics do not apply, so that the analyst is left with nothing to say – for a simple matter of consistency.

The complexities of environmental matters, on their part, make sure that ambiguity is always present in decision-making situations (see on this Funtowicz and Ravetz 1993, 1994), so that conceptual models need to be capable to accommodate this circumstance. Bromley’s model attempts to do just that. What is more, it provides hints on how the controversy can be settled: among competing truth claims, the “reasonable” one is expected to win, implying it is “warranted” and it is “valuable”, as described above. Here is where Bromley surpasses Samuels: what Samuels left blank concerning the “use of the state” is now filled in by Bromley with an analytical construct that can be put to work so as to enter the arguments of the actual discussions in favour or against a certain decision.

Bromley’s model allows us to approach decisions on the distribution of entitlements and obligations (as for RQ2) as a matter of competing arguments (as for RQ3) for or against certain arrangements. It also suggests us to check for the reasonability of those argument so as to understand how the one prevails while others fail. All we need to do is to put the arguments within their deliberative setting so as to gather insights into our objective RQ4: “By which means and processes did actors communicate so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference?”. We can achieve a better

characterisation of the relationship between deliberation and institutions by turning to the work of Arild Vatn.

3.5.3. Arild Vatn

Earlier in the text, we have spent a few words on the distinction between Environmental Economics and Ecological Economics. The use we have made of words such as “critique”, “dissatisfaction” and “reaction” was intended to convey the dimension of debate and, more important, the process behind that distinction, beside or parallel to the analytical implications. Arild Vatn has played an important role in that process, due both to his writings and to his activity within the European Society for Ecological Economics. We say this because what this work has said concerning the field of Ecological Economics is often an elaboration that was at least triggered by Arild’s work and lectures.

Within the body of literature, which is most directly relevant to this work, Vatn has written extensively on institutions and on the link between institutions and rationality. There’s an anecdote that provides a good introduction to the relevance of the latter topic both in Vatn’s work and in the deployment of the present one. The story dates back to a summer-school lecture in the Tatras Mountain, Slovakia, in mid 2007. The specific lecture was held by Arild Vatn. Elinor Ostrom was present and, incidentally, so was Dan Bromley. We were present as well as part of the audience.

Vatn (to Ostrom):

> “In your view, nobody wants to be a… ‘sucker’ (Ostrom nods). For most of my life, I had the feeling that, under certain circumstances I do want to be a ‘sucker’. Being trained as an economist, I always thought there was something wrong with me. It was only after reading a lot of brain science that I happened to realise that it was normal”.

The anecdote is important for several reasons. First: the Ostrom quote. Vatn here is referring to Governing the Commons (Ostrom 1990, pg. 44), stressing the role of specific behavioural assumptions (opportunism) for the analysis of institutional arrangements in New Institutional Economics. This aspect has been dealt with above. A second important aspect is that other approaches may exist and explain behaviour and that "circumstances" may dictate that – Standard Economics treat all circumstances in the same way, postulating opportunism all the way through. This aspect too has been addressed above, while introducing multiple rationalities. Here we attach however to the third point: exposure. It's not just that Standard Economics deals with only one type of rationality (opportunism): it considers it as the only kind of rational behaviour. It may be that nobody wants to be a 'sucker' because nobody wants to be irrational and being a sucker implies just that.

In the anecdote, the exposure of the student Arild Vatn to Standard Economics over the years seems to have strengthened exactly that kind of syllogism, at the cost of an (otherwise commonsensical) circumstance-dependent approach. This is a new element: many of the authors and schools of thought portrayed so far have stressed that there's more in life than opportunism; none has stressed that the motivation one applies may be the product of the motivation one is exposed to, be it in words or in deeds. Finally, brain science has worked as an eye-opener. Differently from Dan Bromley, Arild Vatn grounds much of his work on institutions on experimental findings from behavioural sciences, Experimental Economics in particular. Let us therefore briefly introduce a few, paradigmatic experimental settings relevant for Vatn's theory of economic institutions.

1) The Ultimatum Game – The ultimatum game consists of a series of bids between two actors. One actor obtains a certain endowment (usually money) and has to decide how to share it with his/her partner (the other actor). In turn, the other actor has the option to accept the share or refuse it – in which latter case none of the two actors gets anything. "Rational" individuals would be expected on one hand to accept whatever offer, as something is always better than nothing, no matter how little. Based on this reasoning, actors deciding on the sharing can be expected to share as little as possible, since, *rationally*, their likely aim is to maximise their own benefit.

Empirics reveal instead that "unfair" shares are refused systematically more often than balanced ones and that individual are ready to make sacrifices so as to sanction "unfair" behaviour (Bowles and Gintis 2000; Gintis et al. 2005, pg. 11-13; Fehr and Fischbacher 2004). The maximisation of the material payoff seems therefore not to be what best describes the actors' behaviour, unless hypothetical repetitions in the future with swapped roles are taken into account[11]. A less convoluted way of describing what individuals seem to be after is instead a certain blend of the material payoff and the immaterial benefit of "fairness" – what Bowles and Gintis define strong reciprocity (Bowles and Gintis 2000, pg. 1416; Gintis 2000; Gintis et al. 2005). Interestingly, results get closer to the "rational" prediction if actors play against a computer.

2) The Common Pool Games – Common pool games foresee actors harvesting a simulated public good in the form of a fishery, a forest, a water reservoir etc. The simulated good presents a certain regeneration rate, so that, in theory, actors can coordinate and achieve a sustained harvest over a plurality of rounds. The actors' ability to harvest is, in total, higher than the regeneration capabilities of the resource at stake, so that a coordination problem arises so as to limit the pressure on the resource and avoid its depletion. The outcomes of these type of games generally show that Hardin's prediction holds true only to the extent actors are isolated from one another: as soon as they have the ability to talk, see one another and possibly devise their own rules, the depletion of the resource is at least slowed down if nor halted and reversed (Cardenas et al. 2008; Sethi and Somanathan 2005).

3) The Day Care Fees – A Day Care centre in Haifa, Israel, introduced a fee so as to disincentive the late arrival of parents picking up their children. As an effect, the number of late arrivals increased instead of decreasing: parents felt more comfortable with arriving late as they could make up for it by paying the fine. What is more, the fine was perceived as a price for additional minutes of child care, a price one doesn't mind spending if that frees more valuable time. Interestingly, an increase

[11] Experimental settings control for that too, though.

of the fine eventually reduced the late arrivals, but it never brought it back to its original, pre-fee level. See Gneezy and Rustichini (2000).

4) Protest Bids and Valuation – Monetary Valuation of environmental features is an equally central and controversial branch of Environmental Economics. It consists in the elicitation of the monetary values of given species or entire ecosystems via questionnaire (stated preference), functional equivalence (revealed preference, hedonic pricing) or similar methods (e.g. travel costs method). This approach generally assumes specific characteristics of the preference sets and overall motivation of the respondents. In particular it assumes that payments are always possible and sensible. Spash and Hanley (1995) and Spash (2000; 2006) have dealt with the analysis of "protest bids", that is, of those questionnaires left blank or providing unlikely figures in the fields meant for bids. The studies show that respondents with a stronger environmentalist attitudes have also a stronger tendency towards protest bids. A possible interpretation is that monetary figures make little sense for this category of people or, conversely, that the values those respondents attach to the environmental features at stake can hardly be expressed as bids in monetary figures (Clark et al. 2000).

A few tenets have general value for all settings: a) opportunistic utility maximisation is seldom a convenient description of the way individuals can be expected to behave; b) the settings in which individuals interact seem to determine the way they structure their interaction; c) exposure to different "logics" and "incentives" for action can change the way individuals interact; d) assuming opportunism may lead to surprises in the way individuals react to those incentives and thus to arrangements performing differently then expected. Consequently, Vatn builds up a theory of economic institutions with specific reference on resource use and environmental governance arrangements which sees the latter as fora for diverse, competing logics for action (Vatn 2007) feeding back on the rationality structure of those individuals exposed to the institutions at play (Vatn 2005b, 2009).

In Vatn's work, institutions emerge from internalised logics for action, producing habits which may, over time, blur the original functional rationale behind the institution itself (Vatn 2005a, pp. 31-32). Along with Crawford and Ostrom (1995), institutions translate into conventions, norms and socially sanctioned rules. What is more, institutions produce regularity in life, transfer meaning to things and actions and allow for the structuring of expectations (Vatn 2005a, pp. 82-83). Finally, institutions represent the collective definition of which/whose interests are to count in a specific situation. They thus perform as social devices for conflict resolution in a world of scarcity and of interconnected resources.

All assumptions enlisted above while "setting the stage" for Institutional Ecological Economics play a role in Vatn's idea of institutions. The one concerning multiple rationalities is probably the most prominent, given the intensity of his critique of rationality as maximising and his focus on the existence of a "We-rationality" next to an "I-rationality" (Vatn 2005a pg. 113-118; pg. 122-126; Vatn 2005b; Vatn 2007). This attaches to an idea of context-dependent rationality as a product of the diversity of institutions by which human life is surrounded. On the valuation side, as a direct implication of institutions that entail meaning and therefore value to things, the idea of a limited comparability of values also plays a role, while the interconnectedness of the environment strongly affects Vatn's take on externalities (Vatn and Bromley 1997) and more in general on resource regimes (Vatn 2005a, Vatn 2007).

Through a similar approach we can derive insights directly at the level of RQ3, dealing with those concepts and criteria distributing entitlements and obligations among actors, with reference to a specific ecosystem. The idea that specific situations are dealt with functionally by ad-hoc institutions that foster ad-hoc types of rationality among individuals leads us to consider resource regimes as bundles of heuristics aiming at producing a contextually defined "common good". Based on available knowledge, the latter may encompass the preservation of a given resource or even represent values such as competition or individual achievement. Institutions define what people are after in specific situations and thus how they read goals and allowable actions out of the set of entitlements and obligations that they see for themselves in the given situation.

What we take from Vatn's work for RQ3 is that the concepts and criteria distributing entitlements and obligations are usually functional to "something". This "something" is a context-dependent definition of which particular interests counts as the common good. Out of that common good, an acceptable individual behaviour is spelled out which is more than an endowment of resources and goes as far as to define the type of rationality an individual shall (heuristically) apply to the given situation. As we deal with natural resources for which knowledge is usually imperfect, the heuristic value of the practices emerging from given institutions is enhanced. The functional ties between an institution and its performance on the ecosystem are therefore likely to be blurred, to become invisible over time, or to be understood only ex-post.

From the point of view of RQ3, this suggests that the concepts and criteria distributing entitlements and obligations among the actors, however functional, will have no more value than a heuristic strengthening a certain, specific management practice. The goals thereby entailed are not likely to reveal the full chain of reasoning that makes up their original rationale. Furthermore, as individuals are embedded in a thick web of institutions, partly overlapping and partly contradicting one another, they are constantly exposed to different rationales and different heuristics for similar situations. This introduces a dynamic element, triggering changes in the heuristics connected to specific situations.

3.6. A critical reflection

3.6.1. The role of motivation

Motivation in social sciences encompasses the analysis of the way individuals link values and desires to action. Motivation plays a crucial role in much of the literature above. It does so in two ways: motivation of a certain kind (variously defined as opportunism, economising, utility maximisation) represents a strong assumption and a central analytical device in all of the Neoclassical-oriented literature, from the Pigouvian vs. Coasean schools in Environmental Economics to New Institutional Economics. For the second half of the literature review, the assumptions concerning motivation are released stepwise, until we get to multiple rationalities defined via

institutions, context and exposure, carrying heuristic rather than optimality-oriented value.

At this point, it is important to stress that we are not interested in testing any of these assumptions. At least not per se. Our core interest instead is to build up a model of institutional change which is aware of and consistent with the findings portrayed above, as they prove meaningful to RQ0 to RQ4. In particular, very different things can be read from the distribution of entitlements and obligations (our core research object) according to the assumptions one holds on individual motivation. It is even more important to stress this aspect and make it explicit in the analytical engine of the present work because those readers trained as neoclassical economists may tend to apply opportunism and utility maximisation to the analysis of the materials presented hereby. By doing so, they are likely to be side-tracked or at least to misinterpret the line of reasoning that we intend to buttress with the analysis of the empirics. A warning is therefore in order.

3.6.2. The role of knowledge and information

Another theme recurring across the contributions mentioned above is that of knowledge and information. What individuals know about the specific circumstances and the relationships between the various elements therein represent an important parameter explaining given arrangements and, possibly, the way they change. Denzau and North (1994) introduce shared mental models as a prerequisite for collective action, while Ostrom (1990) points at the way information is produced and shared among the users of a common pool resource as a crucial element characterising the institutional arrangements in which the same users are embedded. Bromley (2006) stresses the role of beliefs and plausibility justifying specific arrangements and triggering institutional change, while Vatn (2005a) explores with great detail the role of limited cognitive capabilities in characterising both decisions and the environment in which these decisions are put in effect.

In our opinion, what follows from the above is this: while addressing our research question and exploring the means and processes through which actors communicate

and identify a rationale for the distribution of entitlements to and obligations towards a given ecosystem (RQ4), we will need to put great emphasis on the way information enters the decision. In particular, Bromley warns us not to simply account for the accumulation of individual pieces of information but to follow how claims are accepted or rejected throughout the whole conversation taking place among actors. In this sense, it will be equally important to show to which extent "mental models" are indeed shared in the sense of Denzau and North (1994) and to which extent, instead, they diverge, giving rise to the rebuttal of specific arguments and reasons for or against specific arrangements.

3.6.3. The role of communication

The point on information requires us to produce an analytical framework which devotes a good deal of attention towards the communication aspects of the empirical case it is expected to enlighten. This focus is already in-built in the formulation of RQ4, focusing on the "means and processes" through which present arrangements are reviewed, problems identified and solutions selected. This aspect has methodological consequences: Bromley's focus on reasonable arguments suggests an ethnographic approach, focusing on the analysis of written materials and interviews. While these methods are very common in the field of Institutional Economics, here we have an ontological justification for the ethnographic approach we intend to take: *if* 1) "means and processes" for the redistribution of entitlements and obligations are what we are after and 2) that redistributions is understood as a clash of arguments for and against specific, discrete arrangements, *then* we have to set up our study so as to characterise those arguments and capture their dynamics for the identification of the arrangement at stake.

Here is another warning for the reader of neoclassical economic training. With the help of Samuels, we have made clear in the above that the configuration of an economy comes about as a product of a blend of deliberative and non-deliberative processes. At this point, it would be inconsistent from our side to structure the analysis in traditional game-theoretical terms so as to plunge into a mathematical modelling of a theoretically efficient outcome by neglecting the deliberative aspects of

the decisions under scrutiny. Instead, maintaining Samuels wording, we need to enter the arena where the use of government is determined and, now going beyond Samuels, unravel the dynamics therein. We therefore need to address the communication between actors: this seems to us the only consistent way of endogenising the decision process into the model. Everything else would instead treat the decision as a black box and merely calculate its consequences – with a doubtful consistency as both Samuels and Bromley have shown.

3.6.4. Static vs. dynamic analysis

The circularity problems highlighted by Samuels in exploring the legal-economic nexus basically consist in attempting to produce statements about something, when the very same thing is already taken for granted somewhere else in the conceptual model. This implies for us a great deal of attention in defining what changes in the model and what instead stands still. In other words, it is important to clearly tell apart variables and parameters within the whole set of the elements in the framework. From the point of view of Economics, it is most important to keep in mind that, given the above, preferences/motivation and information cease to be parameters and become full-blown variables.

It is important to stress this as Economics distinguish static from dynamic models mainly in the light of what happens to production factors – technology in particular. On the side of preferences, analyses are commonly kept static, or else concepts like efficiency would stop applying. This is not the case here. Given the above we intend to describe a change in arrangements as a function of a change in motivation (including both preferences and information or, better, desires and beliefs after Bromley) which in turn is a function of the characteristics of the decision process at play. We will return to this more closely while spelling out the framework.

3.6.5. Micro vs. macro

It is worthwhile to spend a few words on the issues arising from the degree of aggregation aimed at with this work. Mancur Olson (1965) has shown that, in a neoclassical environment, individuals maximising their individual utility do not maximise their utility as a group. Firms are groups made up of individuals. If Olson is right, either we have individuals maximising their utility or we have firms maximising their utility (that is: profit). One can't have both in the same model, which is consistent with what Coase (1937) and Williamson (1979) have to say on business organisation. Matters of space have forced us to leave the full range of implications of this finding on the side. Nonetheless we need here to highlight a specific tension that our framework is exposed to: the one concerning emergence. In other words, it is important to keep an eye on the different levels of aggregation within the model.

The problem is not new: we deal here with the same tension that spans between Psychology and Sociology, between Biochemistry and Biology, between Microeconomics and Macroeconomics, between those who see the trees and those who see the forest. The problem can be described as following: analytical efforts need to identify a unit of analysis; the interaction of those units can produce, at aggregated level, properties which are counterintuitive and which cannot tout-court be explained as a product of the individual properties of the units of analyses. That is why Sociology is not yet a special case for Psychology, fully explaining sociological phenomena only based on psychological drivers. Same can be said for the link between Microeconomics and Macroeconomics and for all the dichotomies mentioned above.

Both Vatn (2005a) and Bromley (2006) deal at length with this point. We approach here one of the major issues in Economics: the fact that a fully agent-based modelling basically neglects the existence of society. This trait of Neoclassical Economics goes under the header of Methodological Individualism. Its opposite is termed Methodological Holism (Vatn 2005a, 48-54). On a different take, Neoclassical Economics relies on Spontaneous Order, while institutionalist perspectives postulate a Constructed Order (Bromley 1998, 235-237; 2006, pg. 43-44). Both approaches deal with the question of social order and specifically with the relationship between what we can claim on individuals' actions and what we can claim on the properties of what they represent as a group (the aggregated product of their action).

Given the above here is our specific problem: can we explain the latter based solely on the former? If we move forward from the axiom that we can't, is it necessary to study either one? Given that the correct answer to this question is worth a Nobel price and that we don't have it, nor do Vatn and Bromley, we circumvent the problem by adopting a research-management perspective: we will complement our formal, agent-based analysis with a rich case description that addresses the holistic perspective and keeps track of what happens at aggregated level. This solution in certainly not elegant and involves a good deal of redundancies, it however allows us to keep a whole series of phenomena under control while exploring and interpreting a complex situation.

3.6.6. Towards a synthesis

Summarising, we are about to lay down an analytical framework which:

- addresses how individuals process values and preferences so as to identify a preferred course of action (3.1.9.1.);
- makes knowledge, beliefs, truth claims and reasons for choice explicit and addresses their mutual interaction (3.1.9.2.);
- explores the actors' possibilities to communicate with one another, mutually raising and reviewing arguments for or against certain arrangements (3.1.9.3.);
- considers the effects the exposure to these arguments have on the way individuals process preferences and information so as to identify a course of action and, with it, a preferred arrangement (3.1.9.4.);
- does NOT distinguish and explore both the individual and the group perspective as the latter is the object of a rich case description (3.1.9.5.).

We will formulate all this in the following Chapter 4.

Chapter 4 – Analytical Framework

Sections: 4.1. Development of the framework; 4.2. Properties of the framework; 4.3. Summary.

Chapter 1 has formulated a series of research questions that Chapter 3 has subsequently explored from within the Economics literature, providing directions for analysis. With the present Chapter 4, we intend to follow up on those directions and develop a framework we can apply for the analysis of empirical materials.

4.1. Development of the framework

The goal of the present framework is to characterise "means and processes [through which] actors communicate so as to identify a rationale for the distribution of entitlements and obligations concerning [a particular] ecosystem of reference" (RQ4). In particular we intend to explain a specific arrangement as a product of the deliberative process that has led to it, starting from a status quo. The first step of our formalisation will therefore be to express:

$$[1]\ A^* = f\ (A_{SQ}; P)$$

where A* is the output of a decision process P concerning the course of action to be taken starting from a status quo situation A_{SQ}. As a next step, we move on by characterising P:

$$[2]\ P = f\ (I; C).$$

We define P as a product of two macro-parameters: Inclusion and Closure. We derive these parameters from Renn (2008). Technically speaking, Inclusion captures the relationship between those participating in the decision process and the broader social context in which the decision process is embedded. Closure captures instead the link between the different participants' preferred decision outputs and the single decision output to be produced by the process (A*).

Implication #1 – We deal with a process that produces an output. We do not deal with a process that allows actors to discuss but doesn't require them to select and approve an arrangement, be it more or less collectively. This follows from the introduction of the Closure parameter.

Implication #2 – We deal with a process that relates to a certain social context (a bigger group, a plurality of individuals) and that involves the intensified interaction of some sort of sub-set of the same context. This follows from the introduction of the Inclusion parameter.

At this point, characterising A* as a function of P (I; C), all else being equal, goes through a characterisation of the social context and the participants. Only this way both parameters C and I acquire meaning and relevance for the arrangements to be chosen. Along with Bromley, in turn elaborating on Commons (Bromley 2006, pg. 49) we refer to the participants within a process as "authoritative actors", in the (loose) sense of individuals enjoying a certain standing (formally or not) within the broader social context at hand. This consideration will have implications later on in the model while exploring the interaction between the participants and their social context of reference.

The Inclusion parameter formalises this connection and its value may range between "No connection whatsoever" corresponding to a random sampling and "Everybody" implying a decision process including all affected individuals. In between there may be various representation criteria such as political representation (a decision process

among elected representatives), functional mandate (a decision process among representatives of technical bodies, judiciary, bureaucrats) or countless hybrid inclusion methods (e.g. processes involving elected representatives and representatives of civil society, processes involving civil servants and private affected parties, etc.). All of these criteria will produce a group of participants whose size range between one and the size of the social context of reference.

Implication #3 – For Inclusion criteria to apply, a certain diversity must be present within the social context at hand and must be recognizable and/or operative to those designing and running the process. We deal with a process which involves a social context where groups or fractions can be identified and involved in a discrete way.

The Closure parameter captures the idea (and with it the assumption) that participants identify different arrangements as individually preferred, at least at the outset of the process. We can express this circumstance as following:

$$[3]\ A^*_t = \{A_{1,t} ; A_{2,t} ; A_{3,t} ; \dots ; A_{n,t}\}$$

where A* is an array of N different arrangements, N is the number of participants and $A_{n,t}$ is the arrangement preferred by the n^{th} participant at time t. We can then formalise C as a Boolean parameter which returns “satisfied” or “not satisfied” on the basis of a specific relationship between the elements within the A* array at a certain point in time. As a criterion for Closure, unanimity would for example require that all elements within the A* array (that is: $A_{1,t}$, $A_{2,t}$, etc.) are equal at the same point in time. Instead majority voting would require that at least 51 percent of them is equal at a specified point in time.

We need now to explore and characterise the variability of each $A_{n,t}$. We define arrangements as distributions of entitlements and obligations across actors, functional to the achievement of a particular goal specified within A itself. We can therefore formulate arrangements as

$$[4] \quad A_{n,t} = f\,(R_{n,t}\,;\, M_{n,t}\,)$$

Where $R_{n,t}$ represents the rationale, the heuristic that actor n at time t adopts in order to identify his/her arrangement of choice, while $M_{n,t}$ is the mental model the same actor adopts at time t as a basis for his/her choice of $A_{n,t}$. With mental model, we describe the set of relationships and inferences an actor takes into consideration while linking the course of action implicit in $A_{n,t}$ to its consequences on those dimensions he/she takes into account while deciding. The wording “mental model” is borrowed from Denzau and North (1994), though the use we make of it adheres to Bromley’s understanding of imaginings and beliefs. While this characterisation of $M_{n,t}$ is sufficient for the moment, $R_{n,t}$ requires a closer look.

$R_{n,t}$ intends to capture, for a given actor at a given point in time, the ultimate heuristic meant for the actor to be pursued by the arrangement of preference. This implies that we go beyond functional goals and search for rationales all the way up the causation chain implied by the contingent $M_{n,t}$. As we assume limited cognitive capabilities for the actors at play, we imply that it will not be possible to translate all situations to a handful or even one single objective (e.g.: utility) and adopt that a single metric for all possible choice situations. This implies, in turn, that individuals must adopt multiple, non-reducible, heterogeneous, context-dependent heuristics. This is consistent with the concept of plural rationalities as in Vatn (2005b, pp.207-208) and becomes self-evident as soon as we characterise and capture the diversity of rationalities an individual can apply. We can formulate $R_{n,t}$ as following:

$$[5] \quad R = f\,(S;\, O;\, T;\, (P))$$

Whereby S stays for Scope, O for Object, T for Target Function and (P) represents a bundle of Pre-ordered Conditions. For the reader's convenience, we omit from [5] onwards the subscripts of the variables. All of them are to be understood as referring to an individual participant n at time t.

An easy way of intuitively understanding what S, O, T and (P) stand for is to consider a rational individual as in Standard Economics. A rational individual is consistently maximising his/her individual expected utility under a set of externally determined constrains. Four elements can be distinguished in that specific formulation: a target function ("maximising"), and object for the target function ("expected utility"), a scope specifying that object ("individual" referred to expected utility) and the fact that the maximisation happens under external constraints.

In our model, the latter circumstance (the external constraints) is implicit in the mental model captured by the M variable. The remaining three elements match exactly the formulation of which at [5], exception made for the absence of Pre-ordered Conditions. This is a peculiarity of the behavioural assumptions generally adopted in Economics. A different set of behavioural assumptions such as Bounded Rationality (Simon 1959), for example, would instead consider rational individuals as in Standard Economics but would also introduce a Pre-ordered Condition requiring that information costs are kept at a normatively specified level. Pre-ordered conditions can in fact take the same SOT(P) structure, allowing for complex algorithms specifying a particular rationale. The complexity of those algorithms is however balanced by two limiting factors: the individuals' limited information-processing capabilities and a requirement of incommensurability.

Limited information-processing capabilities imply that individuals cannot consciously process an infinite amount of variables while ranking alternatives. The number of additional, potentially nested SOT(P) steps mustn't therefore exceed a certain, manageable number of recursions. Furthermore, individuals can pursue aggregated objects such as "utility". For that, no Pre-ordered Conditions are necessary, while the complexity of the aggregation step is shifted onto the mental model variable M. M is similarly subject to cognitive limitations, so that only a manageable number of variables can enter it (the question being which ones finally do and how they connect with one another). The presence of variables within given mental models is however

conditional to their commensurability, that is, the possibility of reducing them to a single metric. Let's illustrate this point.

Assume an individual maximising his/her own expected utility under a certain set of constraints. Let's define

$$[6]\ U = f(x; y; z)$$

We are here describing an individual that is bound to identify the basket of x, y and z that returns the highest value of U given a certain set of constrains. This assumes that it is always possible to express $\partial u/\partial x$, $\partial u/\partial y$ and $\partial u/\partial z$. Even leaving transitivity questions aside, a similar target function would not be able to accommodate variables which are discontinuous or not differentiable over the function's domain. Here is where Pre-ordered Conditions must be met. However, for every Pre-ordered Condition emerging, we have a new Object, a new Scope and a new Target Function describing it. Hence there is a plurality of things being sought after independently, in different ways, at the same time. These "things" are incommensurable precisely because they are sought after independently from one another: if they were commensurable, it would be possible to aggregate them and pursue their aggregated value.

Let's imagine that the variable x and the variable y correspond to two different, commensurable commodities, and that the variable z corresponds to a dichotomy: the same individual being dead or being alive. As a dichotomy, $\partial u/\partial z$ makes little sense already from a mathematical point of view. Furthermore, $\partial u/\partial x$, $\partial u/\partial y$ and the marginal substitution rate between the two commodities $\partial x/\partial y$ make sense only for z="Alive". This implies that the individual we are trying to describe will maximise $U = f(x; y; z)$ only for z="Alive".

The preference for being alive may be object of discussion. What is interesting in this context is that it must represent a discontinuous variable, or else death would exist only hypothetically. The literature on satisficing (Simon 1959, 1986) and on lexicographic preferences (Spash and Hanley 1995, Spash 2000, Spash 2006) has

shown that humans treat a whole lot of "goods" exactly in the same way: as dichotomies, as discontinuous preference sets which constitute pre-requisites to optimisation calculations. There may be different reasons for that: let's explore them with another example. Let x describe the recreational value of a particular coral reef for tourism and y the amount of fishing in the near of it. Certainly a marginal substitution rate $\partial x/\partial y$ can be expressed and confronted with what biologists say about $x = f(y)$, producing a (mental) model M which considers the damage fishing does to the coral reef and expresses the likely development of its tourism-related recreational value as a function of the fishery's pressure.

Let's then imagine a third variable, z, as the health of the coral reef, ranging from "very healthy" to "dead". Surely $\partial x/\partial y$ "passes" through z. In particular The presence of z implies that x exists only within certain sub-domains of it: values of x can be found where reasoning on $\partial x/\partial y$ doesn't make sense. For example, when the coral reef is dead, it is dead and hasn't any recreational value for the days to come. Optimising the trade-off between the amount of fishery and the recreational value is thereby simply not possible. That is why our individual may optimise $\partial x/\partial y$, only under the Pre-order Condition that z stays within a certain range. Furthermore, ensuring that z stays within a certain range may be technically extremely difficult, may exceed human cognitive capabilities or may be ethically not sound. For any of these reasons the individual may simply refuse to enter whatever trade-off about it and require a certain, normatively set level of z.

For our purposes, that would effectively make z incommensurable to x and, even more, to y. Besides, at this specific level of (dis)aggregation we have a variable, z, whose Scope is outside the individual. The individual reacts to z, the state of the coral reef: there may be a connection to the benefits he or she derives from it (specifically, $\partial x/\partial z$ and $\partial y/\partial z$ may exist and give rise to the corresponding formulations of U), but the very fact that the individual refuses to optimise on that and take them into consideration turns z into something which is sought after independently from what benefit the individual derives from it. This way, z comes into play through a Pre-ordered Condition which, in its SOT(P) formulation has a different Scope (the reef) than the rest of the heuristic. Specifically, the individual at play will present a self-centred Scope, utility as an Object, maximising as a Target Function and one Pre-ordered Condition (concerning z): that the health (Object) of the coral

reef (Scope) stays at a specified level (Target Function - technically a satisficing one).

With the above illustration we sufficiently characterised the role of P in the SOT(P) formulation as of in [5]. We can now proceed to characterise the remaining variables of Scope, Object and Target Function.

- Scope (S). Standard Economics is characterised by Methodological individualism, which postulates the individual as the ultimate scope for the consequences of his/her own actions. Alternatively, structural theories of collective action provide ontologies that shift the scope of individual action from the consequences it has on the very same individual ("I"-Rationality) to the consequences it has on the group ("We"-Rationality), regardless of the net position experienced by the individual (Vatn 2005a, 2007, 2009). Similarly, the debate on selfish altruism and social preferences (Gintis 2000; Gintis et al. 2003; Fehr and Fischbacher 2003; 2005, Spash 2006) has taken place along this dimension as a variation of the discussion on reciprocity initiated in Economic Anthropology (Mauss 1990[1923-24], Sahlins 1972). Deep Ecology, being instead characterised by radical ecocentrism, shifts the scope outside the boundaries of the decision maker ("They"-Rationality as in Vatn 2005a): alternative courses of action are chosen among not on the basis of their consequences upon the decision-maker, nor on the basis of their consequences of the group (of which the decision maker is a part) but on the basis of the consequences they have on a third party (specifically, the ecosystem), regardless of their side-effects on the decision maker. Given the above, the variable of Scope serves as a specification of the variable Object and can refer it to the individual, to a third party or to a specific mixture of both.

- Object (O). Standard Economics is equipped with utility functions, a conceptual framework postulating the ability of individuals to aggregate the full series of pros and cons implied by certain choices. Thus defined utility functions allows the Neoclassical Economist to model individuals reacting to the overall level of enjoyment promised by the alternatives they are to choose among: the basis for the decision becomes thus a rationale aggregating the individual relative preference for the expected consequences. Alternative ontologies envision individuals reacting to different

aggregate objectives (welfare, happiness, profit) or to discrete ones. In this sense, the Object variable captures the ultimate object upon which the consequences of the decision at stake are measured so as to rank the possible alternative outcomes.

- Target Function (T). This dimension encompasses the maximising vs. satisficing debate. No matter what specific Object (aggregate or disaggregate, be it utility, profit, shareholder value, pollution, population size, economic growth, information search etc.) is being processed by the Target Function of choice, the question is whether it has to be increased/decreased indefinitely (as much as possible), solving a problem of optimisation under constraints, or whether it has to reach a specific, normatively set and intrinsically desirable level. Corporate profit maximisation, Simon's first viable alternative, Rawls's greatest benefit to the least-advantaged members of society are examples of Target Functions (…maximisation…; …first…; …greatest…) coupled with specified objects (…profit…; …viable alternative…; …benefit…) and scopes (…corporate…; …least-advantaged member of society…) entailing, together, specific rationalities within a SOT(P) format.

Implication #4 – Within the characterisation of R given above, "rational" behaviour as in Standard Economics (individual expected utility maximisation) represents a special case. So do Bounded Rationality, Satisficing, Lexicographic Preferences and Social Preferences. Other than for the standard one, the latter ones require more complex algorithms, to be formalised through series of potentially nested Pre-ordered Conditions (P).

We have so far produced a framework characterising the participants' behavioural assumptions (R) and the cognitive elements that they employ for the decision at stake (M). We have expressed the arrangements individuals would support as a function of these two elements ($A = f(R; M)$). We can now turn to a characterisation of the dynamics that the decision-making process sets in motion so as to achieve a decision output A* starting from a set of heterogeneous individual A's.

For the condition of Closure to be satisfied, a certain degree of homogeneity among A's must be achieved. Leaving aside the rare case where this homogeneity is

present already at t=0, something must change over time in those parameters that make up the A's for a decision output A* to be produced. With the above we have achieved a characterisation of these parameters. We turn now to the question of why the individual elements of R and M can change. As we deal with decision processes, our attention goes to those elements of a decision process that can be expected to trigger such changes.

From Samuels onwards, the literature review has stressed the deliberative dimension of decision-making processes. In particular the exchange of and exposure to arguments has been pointed at as the dynamic factor in identifying "the best that could be obtained under the circumstances" (Bromley 2006, pg. 80). We therefore need a framework which allows us to formulate hypotheses on the changes that the exposure to particular arguments can trigger on the participants' R's and M's so as to reduce the heterogeneity of A's and satisfy the Closure condition.

We start from the assumption that participants, through arguments can alter each other's R's and M's. Since A = f (R; M), the exposure of the participants to specific arguments is bound to alter the elements of the A* array. We furthermore assume that arguments bear specific R's and M's and that their effects on the recipients' respective R's and/or M's come about accordingly. We assume, in other words, that the exposure to arguments bearing a specific element of a mental model (M) leads the recipient to take that element up in their own mental model. Same goes for the individual elements of R: S, O, T, and P. We assume that being exposed to arguments that carry, for example, a specifically formulated Pre-ordered Condition or Scope, leads the recipients to alter their individual R so as to take it up. What we, instead, do not assume is that arguments exchanged in a deliberation reveal to the analyst the true foundation of A held by the participant speaking up. Reason for this is that we assume the participants to behave (and argue) strategically.

Implication #5 – In our model, arguments do not produce counterintuitive effects. Through the formulation above we implicitly exclude that being exposed to a specific M or SOT(P) produces changes in the recipients that are logically inconsistent with the arguments at stake.

An illustration may clarify. Take a decision process developed around two specific variables x and y. Imagine a participant arguing that variable x produces effects on y according to a specific formula $y = f(x)$. We read the following two things out of this argument. 1) We don't know whether the speaker actually believes that $y = f(x)$ is the best description of how x links to y – he/she may actually rely on $y = g(x)$ within the mental model (M) that he/she actually uses so as to derive his own $A = f(R; M)$. We don't know it from this one argument. 2) The participants being exposed to the "$y = f(x)$" argument, as an effect of this exposure, are led to believe that x links to y as $y = f(x)$. This at least as a first approximation.

Two questions are still open: 1) whether $y = f(x)$ in the minds (and mental models) of the recipients is the same as $y = f(x)$ in the argument which has been voiced, and 2) whether the uptake takes place at all. The first question is one of interpretation across participants. Here we rely on the (strong) assumption that arguments are formulated with sufficient clarity to bring their core elements across: details may be blurred but the core of the message is assumed to be clear. We rely on this assumption for matters of simplicity and leave an exploration of the effects of ambiguity to future research. The second question, instead, is quite central and requires a thorough exploration, separately for R and M. We begin with the latter.

As far as mental models (M) are concerned, the central question is whether participants can alter each other's beliefs by the means of exposure to arguments. The role of competing truth claims in environmental matters has been highlighted above. This calls to our attention, that we can expect participants to hold quite different beliefs on what's going on out there. It is also rather commonsensical that individuals take decisions based on what they think they know. This means that even the strategically behaving participant is quite likely to target the other participants' ideas of what's going on out there so as to pursue his/her own aim (however the latter is defined: individually, altruistically, collectively and the like). Specifically, the strategically behaving participant is likely to try and alter the other participants' understanding of what goes on out there in a convenient way. We don't know whether he/she holds for true what he/she is saying. We assume however that it is

convenient to him/her *that others hold that for true*, be that for material interests or for matters of, for example, honesty.

Here is where we introduce the dimension of persuasiveness. By that we mean the ability of an argument to trigger changes in the minds on those individuals being exposed to it. More specifically, we distinguish the persuasiveness of an argument from its content. The content of an argument tells something about what specific changes it can trigger in the recipients' R's and M's. The persuasiveness of an argument captures instead the strength through which it is able to produce those changes. Content and persuasiveness are kept analytically separate. Here is were our framework departs from Bromley's account. In his view, the uptake of beliefs depends both from the content of it and from the position of those who raise it. The condition of "warranted belief" makes an argument persuasive if it comes from an authoritative epistemic community – this is content-independent. The fact, however, that an argument must be "reasonable" and "valuable", is clearly content-dependent.

Assessing the persuasiveness of an argument on the basis of its content is problematic in a world of imperfect knowledge. Most of all, either it would correspond to taking sides on contested issues or it would assume better, less imperfect knowledge on the side of the analyst. This is why we prefer to recede from a content-based assessment of the arguments and derive their persuasiveness separately, on a different, content-independent basis. We do so by postulating an *emotional appeal* of an argument, which in turn is a function of the formats used so as to voice it. By doing so, we assume that the more often an argument is voiced and the broader set of (physical) means is used so as to voice it (flipcharts, graphs, pictures, slideshows, voice, non-verbal means such as pantomime etc.), the more persuasiveness it gains and therefore the likelier it is that it is going to be picked up.

We see two reasons in support of this approach. The first one is that it's not too far away from common-sense: in a world dominated by visual media, telecommunications and information overflow, it is not too odd to think that the exposure to contents plays a role on their endorsement – it's indeed the foundation of marketing. We also do not say that contents play no role in the persuasiveness of the arguments around: what we say is that we don't look for that, at least at a micro-analytical level – the rich case description is certainly better suited in these respects. This bring us to the second reason in support of content-independent, formats-based

persuasiveness: it is testable. We can account for how often and by which means a certain message is raised and verify how well it gets across.

The above applies to the variable M. A few specifications are however necessary before this all can be extended to R. The R variables encompasses the algorithm an individual consciously adopts so as to identify his/her own arrangement of choice among the available alternatives. The R variable, in its SOT(P) formulation translates into a more or less complex list of things explicitly to be taken into account while deciding, complemented with a specific way of taking them into account (as much x as possible, enough of y, no more than this much of z etc.). The individual, as a participant, is exposed to arguments voiced by other participants stressing the importance of taking this or that other element into account, about the necessity of not taking this or that specific element into account, about the implicit moral commitment of taking something into account in a particular way etc. Our line of reasoning is that, through this exposure, the recipients' SOT(P)'s change. They do so (or don't) as an effect of the persuasiveness of the argument (as laid down above). Content-wise, we assume they do so consistently with the arguments raised.

We see here, however, a possible source of ambiguity in the conversations taking place during decision-making processes. We see two possible, not mutually exclusive ways of interpreting R-laden arguments, bearing a particular SOT(P) connotation in the eyes of the individual participants exposed to them. One focuses on the persuasion dimension of voicing the argument: raising SOT(P)-laden arguments so as to change R in the mind of those participants being exposed to the argument. The other one, instead, falls back to the informative dimension of the argument: raising SOT(P)-laden arguments so as to better communicate one's own R, regardless of the recipients' ones. In this second interpretation, the focus of the change is M, not R. Specifically, the argument has the aim of affecting those elements in the recipients' mental models that capture and express the other participants' R's. An example may clarify.

Take a participant advocating, once again, for a sense of community in taking a certain decision. In Vatn's words, that participant would be breaking a lance for "We-rationality" (Vatn 2007, pg. 13), which we can formulate in SOT(P)-terms as a broadening of the Scope variable. Given the degree of persuasiveness, the recipients

being exposed to the argument may or may not take it up. The problem is that there's two ways for them to take it up: one is to perceive it in R-terms and change one's own Scope towards more community; another one is to perceive it in M-terms and believe that the SOT(P) connotation of the argument expresses the actual R of the speaker, who, given the speech, seems really to think in community terms (be it counterintuitive or not).

This implies that a participant's mental model (M) contains beliefs concerning the R's of his/her counterparts. Specifically, the recipients may have an idea concerning the SOT(P) terms applying to the fellow speaking. The participant's biographical record may tell how solid and rooted in the individual's M such beliefs (including the absence of beliefs) may be. Concerning the specific fellow speaker at stake, these beliefs may or may not involve community.

The exposure to R-laden arguments may either strengthen or question this, provided a certain degree of persuasiveness can be granted. Consistently, recipients can discover to their surprise that the fellow speaker thinks indeed in community terms and review those elements of their own M's that say otherwise. Regardless of all this, being exposed once again to the community mantra may make their R's more community-oriented, even if no R-related updates of mental models (M) take place.

We hence distinguish an R-effect from an M-effect in the exposure to R-laden arguments. This wasn't present and can't be present in M-laden arguments as they miss, content-wise, an SOT(P) structure. The two effects are both a function of the argument's persuasiveness. We will therefore treat the M-effects of R-laden arguments the same way we treat M-laden arguments proper. The two effects are also considered independent from one another. We can therefore treat the R-effect independently from the existence of the M-effect.

The reason why we make this distinction is that strategic behaviour and social acceptability represent a problem of interpretation not only for the analyst but also for the participants. As a matter of fact, within the conversation taking place in a decision-making process, participants do not talk to the analyst but talk, first of all, to one another. If R-laden arguments present distortions in terms of revealed preferences, they don't do so because an analyst may be watching. They do so

because participants may or may not behave strategically towards one another – and may or may not be mutually aware of that.

From the analyst's point of view, an intermediate hypothesis emerges from the specification above. According to the framework laid out so far, arrangements change as a product of deliberative decision-making processes because the latter produce changes in the A = f (R; M) held by each individual participant up to a point that satisfies the Closure condition at play. Decision making processes are here seen as able to produce these changes by the means of exposing participants to arguments. Arguments may be either R-laden or M-laden. While the effects of the exposure to M-laden arguments seems straightforward, it appears that the exposure to R-laden arguments may sort out, independently, both M-effects and R-effects on the recipients. This would lead to the counterhypothesis that, for a given exposure to R-laden arguments, a change of arrangements is triggered by M-effects, with no change in individual R's.

Let's assume a certain degree of awareness, among participants, of mutual strategic behaviour. This assumption counterbalances the extent to which R-laden arguments may sort out M-effects, downsizing the relevance of the counterhypothesis formulated above. Testing for this awareness requires however an experimental design of its own, exceeding the capacities available for this work. We would therefore tend to simply take it for given, and possibly re-discuss the findings in the context of an ex-post sensitivity analysis. As for other controversial aspects raised above, we prefer however not to fully exclude the possibility that M-effects of R-laden arguments take place and affect the development of the A* array. We will therefore keep an eye open for it in the rich case description, while concentrating on R-effects in the formal analysis.

Here is however where we put the model's black box, the non-economic bottom whose workings we arbitrarily assume and leave to colleagues of other disciplines to test and refine. A (social) psychologist is certainly better suited in discerning why a certain argument collects a stronger approval than another one. He or she may eventually be able to weight the relative contribution of different types of formats carrying the same argument, quantify the resulting persuasiveness in ways compatible to the framework developed here, and possibly link it to neuroscientific

evidence. The present work will not go as far. It assumes linearity, instead. Specifically, we will count how often a certain argument is voiced and will not give different weight to different formats. We do so for matters of simplicity and leave more differentiated accounts to better suited colleagues. As we will not deepen the analysis in this direction, we can now concentrate on the implications that the above reference to the "emotional appeal of arguments" bears for the framework's behavioural assumptions. To those now we turn, as we need to ensure their consistency.

Implication #6 – Individuals reshape their context-dependent rationality as an effect of the "emotional appeal" of the arguments they are exposed to. If the exposure to and consideration of arguments produces non-material payoffs for the individual, a problem of circularity may emerge: payoffs are a function of the specific rationality, though rationality becomes dependent on payoffs. We work around this problem by postulating a pre-ordered, non-reducible, non-conscious hedonic calculation upon which the emotional appeal of arguments hinges.

A hedonic calculation is a calculation of pleasure and pain as usual in Standard Economics. Here, we postulate individuals applying a hedonic calculation for the selection of the rationality pattern to apply – specifically, the endorsement of R and M elements in a participant's $A = \mathit{f}\ (R; M)$. We assume this hedonic calculation to be pre-ordered to the one through which they identify A. As such, it is non-commensurable and cannot lead to trade-offs between its own outcomes and those produced by the choice of A. Assuming it as non-conscious, we also postulate that it's not object of deliberation among participants nor it can be strategically acted upon.

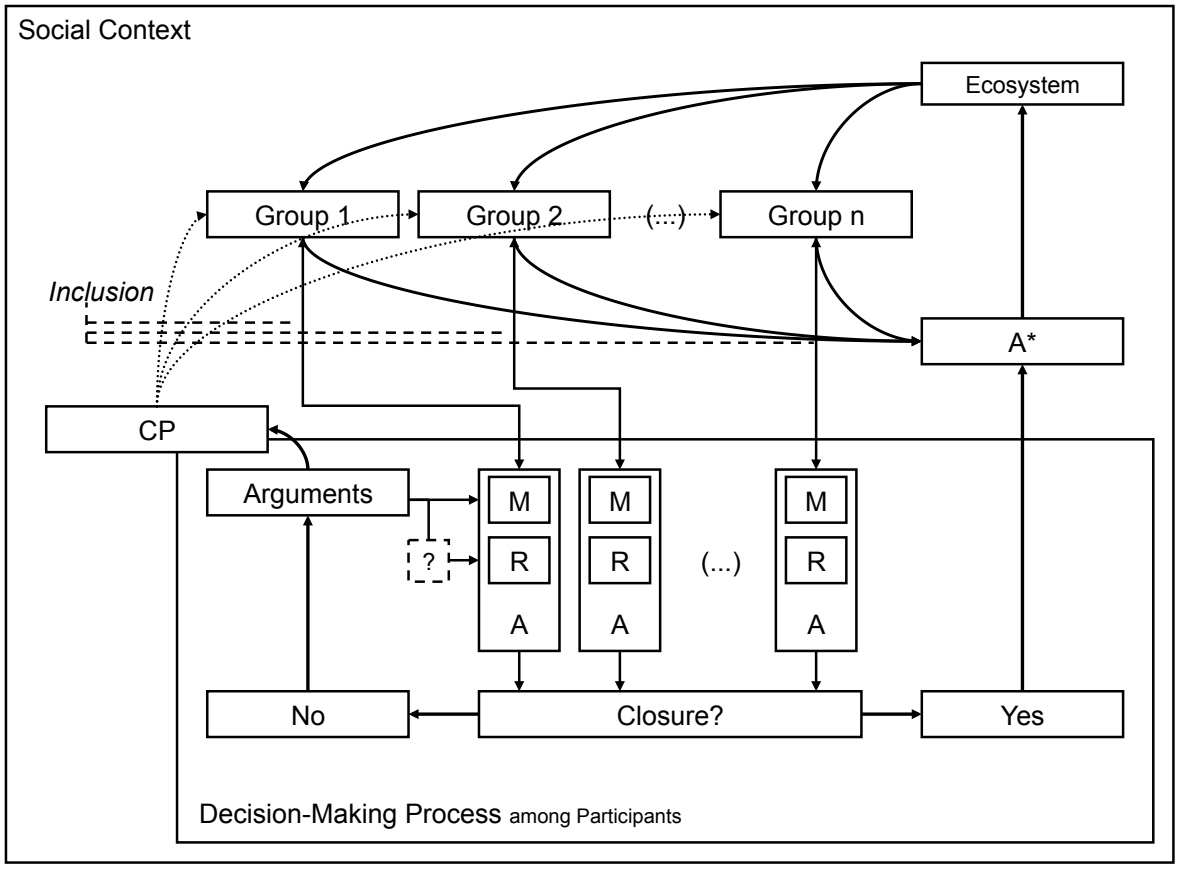
From our perspective, it can only be observed ex-post by observing the endorsement or rebuttal of the arguments voiced. This will be the general methodological principle around which we will structure the analysis of the empirical materials. Chapter 5 will present a specific case study and provide a rich case description of a decision-making process on environmental matters. Chapter 6 will then apply the framework

hereby developed and test a set of hypotheses on the role the deliberative process has had on the decision at stake. The specific hypotheses will be tailored to the rich case description and formulated in their definitive form at the end of Chapter 5. At this point, our aim is to provide continuity through a general hypotheses that qualifies RQ4 in the light of the theoretical discussion above.

The formulation of RQ4 ("By which means and processes did actors communicate so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference?") is descriptive in nature. The insights we have drawn from the literature do not diverge much on what these means and processes are but rather on the effects they produce. This is particularly true for the case of motivation and its relative importance compared to information, which we capture through R and M in the framework above. For this reason the general hypothesis will address the relative contribution of motivation changes in explaining the change in arrangements throughout the process. In general, we intend to test whether:

$$[H0]\ \partial R/\partial P \neq 0 \text{ so that } \Delta A^* = f\ (R \mid P),$$

meaning that we intend to test whether we can explain the change of arrangement ΔA^* as a function of the change in rationalities produced by the process (R conditioned to P). The process is here understood as the bundle of arguments exchanged during the time that has been necessary to take the decision, provided we can detect a change in R and explain it on the basis of the very arguments exchanged. The graphical representation below will illustrate the idea: the relationship at the core of the hypotheses H0 is the one marked by a question mark in a dotted box. The figure shows how it connects with all dimensions highlighted above: the participants' mental models (M), their rationality (R), their individually preferred arrangements (A) and the decision output (A*).



Legend
M: Mental Model
R: Rationality
CP: Communication Policy
A: Arrangement
A*: Decision Output

Figure 4.1 – Analytical Framework.

4.2. Properties of the framework

Connecting all elements as in Figure 4.1 reveals some properties of the framework. Specifically, the framework produces four different loops: 1) the resource regime, 2) the policy cycle, 3) the decision-making loop and 4) the representation loop. It is worthwhile to spend a few words on each of them.

The ‘Resource Regime (1)’ is the loop between the ‘ecosystem’, the ‘social groups’ depending on it and the bundle of entitlements and obligations these social groups obtain through the ‘Arrangement A*’. This loop bears the name resource regime

because the different groups at stake indeed derive their entitlements to and obligations towards the ecosystem at stake from the arrangement A*. The arrangement A* determines the way these groups affect the ecosystem. As they are all, in different ways, dependent on it, they are all affected by its overall state. Given the assumptions of interconnectedness and imperfect knowledge described above, the ecosystem as a whole is best described as a common pool resource (more precisely: a joint impact good) shared by the different groups involved. This, in turn, implies that the social groups affect one another through the use they jointly make of the ecosystem. This closes the first loop.

The 'Policy Cycle (2)' is represented by the loop encompassing the 'decision-making process', the 'arrangement A*', the 'ecosystem', its effects on the groups making up the 'social context' and their representative within the decision-making process. A policy cycle encompasses the phases of agenda-setting, decision-making, implementation and monitoring, whose findings are fed back to the agenda-setting phase and thus close the loop. All these phases can be recognised in this specific loop: the agenda setting happens among participants within the decision-making process; the arrangement A* represents the product of a decision, whose implementation affects the ecosystem and the social groups. The latter have a representation link within the decision-making process, which closes the loop.

The 'Decision-Making Loop (3)' is the one running from the participants 'preferred arrangements' (A) to the 'Closure condition' to the exchange of 'arguments' among participants and back to the 'preferred arrangements'. This loop represents the fact that, for the type of processes of interest here, participants are required to achieve a certain degree of agreement (including that they agree to disagree and continue to live with the consequences of the status quo). This loop is the only one with a hole, constituted by the satisfaction of the Closure condition described at the beginning of Section 4.1. in Formula [2]. Introducing the Closure condition implies that participants are stuck in the loop of the decision-making process until their M's and/or R's change just enough to produce a change in A*. As soon as this is the case, we move to the Policy-Cycle Loop.

The 'Representation Loop' (4) is the one between the groups making up the 'social context', their respective representatives within the decision-making process, the

non-satisfied ‘Closure condition’ and the ‘arguments’ voiced within the process (due to the fact that Closure hasn’t been achieved yet). The loop is closed by the process’s ‘communication policy’ (CP in the figure), allowing the social groups to follow the decision-making process to a given degree and subsequently make use of their representation channels so as to provide a feedback to their respective representatives.

The presence of four loops stands for a high degree of complexity. For the analyst, the major problem is the one of assessing the relative strength of the different loops, so as to ascertain which one is set to prevail. Here is where Bromley’s and Commons’s reference to authoritative actors comes to help. We have assumed participants which, one way or another, hold a certain standing in the broader social context of reference, at least concerning the group they are to represent. Authoritative actors are therefore not seen as simply passive recipients of their constituencies’ preferences towards the arrangements. We assume them to be in a position to alter those preferences by leveraging their own charisma, reputation and position within the group. That is why the arrows connecting the groups with the participants go two ways.

This latter circumstance allows us to minimise the effects of the representation loop and of the policy cycle loop, at least at analytical level. We can thus concentrate on the decision-making loop and control for the relevance of the other loops at the level of the rich case description.

4.3. Summary

Chapter 3 had the purpose of exploring the Economics literature relevant to our set of research questions. With the present chapter we have then produced a framework capable of capturing the literature’s relevant findings in analytical terms and allow for the analysis of empirical materials. The framework thus produced enters the specifics of deliberative decision-making processes and formalises a few relationships between the arrangements at stake, the mind-sets and rationalities of the actors involved and their way of interacting through the exchange of arguments. We could

thus formulate a general hypotheses, focusing on the relative role of the actors' motivation and their mental models in producing shared arrangements. The general hypothesis will be tested against empirical evidence in Chapter 6, after Chapter 5 has introduced the empirical setting. The latter chapter will allow for a specification of the general hypothesis, while a series of additional aspects emerging from the analysis of the framework's implications will also be controlled for.

Chapter 5 – Rich Case Description

Sections: 5.1. The Werra case; 5.2. Insights from the materials; 5.3. Summary.

The previous chapters have explored several branches of the Economics literature and produced a framework for the analysis of social processes in environmental decision-making situations. With the aim of putting theory and empirics on equal footing, the present chapter provides instead a rich case description of a particular decision-making process. The goal is again the retrieval of answers for RQ0 to RQ4. The approach is however based on the organisation of empirical materials on the basis of induction and common sense.

A certain redundancy is evident and unavoidable: bluntly put, why does one need to approach such a large and complex bundle of information if an analytical framework is available that reduces complexity to a limited number of variables? What is the aim of providing a similarly complex analytical framework if one then approaches empirics independently from it? The reason is twofold. First of all, from a technical point of view, plurality of methods fosters the robustness of the results. Secondarily, we defend that a plurality of representations reduces the ambiguity caused by the reliance on common sense in approaching and interpreting the empirics.

In this chapter we will present empirical materials concerning a specific case study. Our aim is to provide an in-depth description and documentation of the case. The following Chapter 6 is dedicated to the formal analysis of the same materials through the framework developed in Chapter 4. The difference in approach between Chapter 5 and Chapter 6 has the effect that not all elements presented herewith will appear in the analysis, nor will the present description be strictly limited to the elements required by the analytical framework adopted. Instead, we intend to provide a rich case description that can be read and understood without reference to the theoretical chapter. In other words, this chapter can be read as a stand-alone section of the document, which has purposes of its own and which the thesis draws on so as to better ground its own analysis and findings.

By doing so, we make the collected materials accessible to the interviewees involved in this research while providing an intuitive background for the analytical findings presented in the following chapter. It may therefore help the reader to keep this in mind: the stand-alone character of this chapter causes several elements to appear in the present chapter that will not directly be referred to in Chapter 6's formal analysis. These elements are meant to better qualify the ones that do appear there, both for the data they constitute and for the findings they suggest. Our purpose is to make the chapter as much independently readable as possible. This also implies that the present chapter partly duplicates what already reported concerning the Werra case. The rationale behind this duplication lies in the research strategy adopted so as to identify a suitable case study for this part of the research.

As mentioned in Chapter 2, the research context required that project and dissertation work be coordinated. The project required reporting on several case studies. The thesis had, however, no comparative intentions. We therefore did not understand the case studies as materials for cross-case analysis. The link between the project's case studies and the thesis's empirics constitutes an iterative process of adjustment between the thesis's theoretical approach and both quality and availability of empirical materials for its application.

The cases addressed in Chapter 2 had therefore not only a role in justifying specific choices in Chapter 3. They also represented a pool of potential cases for more in-depth analysis – their comparative suitability being a matter of expected data availability and quality. Among all cases portrayed in Chapter 2, the Werra Round Table offered abundant, detailed and publicly available documentation. It thus proved as the most suitable for our analysis and became our case of choice. That is why it reappears in the present chapter: the following sections provide a more detailed account of the developments in the case, present the materials we collected and reflect on the cases from the point of view of RQ4.

5.1. The Werra case

The Werra case deals with mineral extraction in an area across the States of Thuringia and Hessen in Germany. The extraction activities relate to a single producer, K+S, which is a global player on the fertiliser market, employs about 5.000 and sustains about 10.000 households in total in an otherwise economically weak area (Döring et al. 2009). The extraction activities produce however a high amount of solid waste, 14 million tons salt every year, whose main channel for disposal is the river Werra.

Several con-causes have forced a re-discussion of the status quo conditions for the operations of K+S. Among those, new insights in the geology of the watershed, pending deadlines concerning the implementation of the European Water Framework Directive, and the expiration of previous authorisations require new arrangements for the disposal of the salt. For this to be done, a Round Table has been set up, involving almost all social groups affected by and potentially involved in the achievement of a new arrangement.

The case is highly relevant for the questions addressed in this work: namely, it deals with a participatory process which has been set up so as to identify in which direction a socio-ecological system will move. It therefore addresses RQ0, or “how participation affects the state of socio-ecological systems”. Furthermore, it makes reference to specific economic activities: not only extraction is at stake, but also the future of the local tourism, the downstream fisheries, the provision of drinking water, the production of hydropower and so on. We see therefore a direct link with RQ1, that we formulated in Chapter 1 as: “How do economy and ecology affect one another in a given ecosystem?”

The case also has a regulatory dimension, particularly concerning the formal authorisation regime for the operations of K+S. We have a link to RQ2 and RQ3, respectively dealing with the entitlements and obligations that draw the line between economy and ecology, and with the concepts and criteria that structure the correlated distribution of entitlement and obligations. The relevance for RQ4, addressing those means and processes used so as to identify a rationale for the abovementioned distribution, is furthermore enhanced by the participatory process that has to envision a new set of arrangements for the salt extraction industry in the area. The process is

indeed highly formalised and structured and constitutes a change in the way actors interact in order to draw the line between socio-economic and ecological concerns.

The following section will present the case in detail, on the basis of interviews with RT participants and organisers as well as with reference to publicly available information sources.

5.1.1. The Narrative

Salt extraction along the Werra river is an activity dating more than a century back. The minerals thereby extracted (referred to as "salt" for the sake of simplicity) are used in the production of fertilizers and are therefore connected with the developments in the world-wide agricultural sector. Quality issues cause however 70 to 80 percent of the extracted salt to have no commercial value. The vast majority of the materials therefore extracted by K+S from the underground represents waste, while a small fraction of high quality salt allows for considerable returns in the form of fertilisers for the world-wide market.

The production of waste requires a channel for its disposal. Historically, the discharge in the Werra has constituted that channel. Consequence was that already at the end of the 19th century even the city of Bremen, more than 400 km downstream, had to find alternative solutions for the provision of drinking water[12]. Despite the trade-off, the extraction of salt was considered sufficiently important to authorise the discharge of salt-rich water into the Werra up to present days.

The Werra is a roughly 300 km long river crossing the States of Thuringia, Hessen and Niedersachsen. It joins the river Fulda in Hannoversch Münden. Together they form the Weser, flowing in the direction of the North Sea for further 440km and crossing two more federal states: North Rhine-Westphalia and Bremen. The river crosses the former border between East and West Germany and, interestingly, the extraction sites are located in the vicinity of where that border used to be. The fact

[12] Source: "Common Demand for a Living Fulda, Werra and Weser" (*Gemeinsame Forderung für eine Lebendige Fulda, Werra und Weser*) of Civil Society Groups and Environmental NGOs, 2007. Annex of the Statement by BUND Thuringia.

that the salt extraction took place on both sides of the German-German border made it a matter of international relations between the two countries. This has basically limited the range of options of the downstream country West-Germany to adaptation measures: the degree of salinity coming in from East Germany had to be taken for given.

The Werra-Weser watershed used to be rich in fish population at the beginning of the 20th century. Its value as a habitat decreased rapidly during the industrialization of the country and definitely collapsed after World War II, mostly as a product of the increased salinity. From the point of view of water quality, the overall river system is to be considered rather degraded[13]. The overall watershed has therefore a low value as a fish and bird habitat, even though the situation is improving: salmons are for example repopulating the Weser and fisheries could still survive in the most downstream segments of the watershed[14]. The river also crosses several environmentally valuable habitats, some of which belong today to the Natura 2000 Network. No information is currently available concerning the role the increased salinity directly plays in the development of these areas.

The above has portrayed the trade-off at stake in terms of salt extraction vs. water quality related to the abundance of species in the Werra-Weser water environment. Though, the diversification of disposal techniques that took place in the last two decades broadened the spectrum of conflicts. The introduction of drying technologies, in particular the ESTA processing technique, has allowed significant quantities of salt to be extracted from refuse waters. Salt concentrations could be immediately lowered, producing however solid waste that causes problems of its own.

Even though energy requirements make the generalised application of such technologies unfeasible, the real question is that of the storage of the solid refuse. The way the matter is currently being dealt with is by accumulating it in enormous salt heaps: one interviewee namely referred to the area where the extraction takes place as “the land of the white mountains” (Group: Environment)[15]. The impact of this

[13] Source: Written statement by the representative of the Federal Government at the RT.
[14] Source: “Common Demand for a Living Fulda, Werra and Weser” (*Gemeinsame Forderung für eine Lebendige Fulda, Werra und Weser*) of Civil Society Groups and Environmental NGOs, 2007. Annex of the Statement by BUND Thuringia.
[15] Original text: *“Das Land der weißen Bergen”*.

disposal technique on the landscape is indeed all but negligible, while further concerns are raised in terms of air quality due to the production of dusts and possible effects on human health for the local residents. Finally, the weathering of the salt heaps produces salt-rich run-off, which ultimately increases the salinity of the Werra. Under this perspective, the production of salt heaps cannot be thought of as a way of disposal. Instead, it represents a way of postponing salt discharges with additional impacts on landscape and air quality.

A second additional and controversial disposal channel is constituted by the practice of injecting salt-rich wastewater into the underground. This is being practiced since more than five years now[16] and involves roughly the same salt quantities as the ones presently discharged directly into the Werra (about 7 million tonnes per year). This practice has been so far authorised considering the underground layers as water-tight. Such belief has been put to question when ground water basins used for drinking water purposes have started showing increased salinity. Recently, this belief has been proven wrong, so that the practice is now likely to be phased out[17]. What is more, the water injected in the soil is now likely to constitute a diffuse source of salinity for the decades to come.

Introducing now an historical perspective, we can identify two major turns: the German Reunification and the introduction of the European Water Framework Directive. The German Reunification has turned a previously cross-border issue into an internal one – the Weser watershed is indeed one of the few watersheds entirely on German soil[18]. In the German three-tiered federal system, Environmental issues are however a matter for state administrations, so that discussions have moved from a two-actors to a five-actors negotiation platform, now involving Hessen and Thuringia on the one side (upstream federal states, hosting extraction facilities) and Niedersachsen, North Rhine-Westphalia (in the following: NRW) and Bremen (downstream federal states, not hosting extraction facilities) on the other side.

One important implication of the Reunification is that the overall national and sub-national regulatory framework has moved away from lax GDR environmental regulations to the more stringent regimes of the Federal Republic of Germany (BRD)

[16] Source: Minutes Meeting 4, pg. 3.
[17] Source: Minutes Meeting 7, pg. 4.
[18] Source: Statement from the Bremen Parliament (*Bremische Bürgerschaft*), October 16, 2007.

back then and in today's unified Germany[19]. This has allowed for much of the progress that has been made so far in terms of abatement efforts. During the years of the separation, the very same more stringent regulations in the BRD have also stimulated a certain technological development in terms of general wastewater treatment, so that improvements could be obtained, first, by replacing obsolete technologies on the former GDR side and, second, by sustaining a practice of investments in continued technological improvement even after the reunification process[20].

The latest point is relevant in order to understand the impact of the European Water Framework Directive. Quality requirements in terms of wastewater are a rather unified across Germany, they are however based on case-by-case judgements with reference to BAT/BATNEEC[21] considerations. As pointed out by one interviewee from the administration, the basic absence of competition, strengthened by the case-by-case approach (as opposed to sector-wide minimum standards) may lead to question the role of the present regulations in stimulating technological development.

One may perceive the current situation as one in which a single company is in the position to choose how much it wants to push the BAT further and/or how much it wants to invest so as to make technologies reachable, that are currently beyond BATNEEC. In such a situation, the European Water Framework Directive has significant implications. We have carried a detailed analysis of the communitarian and domestic legal framework shaping the arrangements at the Werra. The whole analysis, which includes the role played by the European Water Framework Directive, is available in Appendix 1. Here, instead, we just intend to point out the general change in perspective that the directive brings about for the Werra case.

The European Water Framework Directive introduces several novelties in water matters. Among those are the good ecological status and the economic analysis. The good ecological status is groundbreaking for the practice of water management: while prior water regulations were limited to water quantity and quality and equated the latter with its chemical composition, the good ecological status shifts the focus to providing viable habitats for flora and fauna. The focus on habitats makes the

[19] Source: Interview with a representative from the group "Administration".
[20] Source: Statement from the Bremen Parliament (*Bremische Bürgerschaft*), October 16, 2007.
[21] Best Available Technology, Best Available Technology Not Entailing Excessive Costs.

compliance to concentration standards based on a closed set of chemical compounds insufficient: a chemically compliant water body may not necessarily constitute a viable habitat for a certain set of species. If the objective is to ensure that water bodies constitute viable habitats, the attention shifts to species populations and their possibility to thrive. The chemical status is thus downgraded from a sufficient condition to a merely necessary one[22].

The above certainly constitutes an increase in complexity and hence in the effort necessary for complying to water regulations. The economic analysis introduced by the Directive represents thereby a counterbalancing factor. The task for water managers has become more complex as they are now required to go beyond a good chemical status and achieve a good ecological one. They are however obliged to do so only to the extent that it does not entail disproportionate costs. Compared to European biodiversity regulations, this is new: both Birds and Habitats Directive foresee exceptions (and require compensatory measures) in case of "overriding public interest" and rulings from the European Court of Justice exclude potential economic benefits from this category[23]. What for the biodiversity regulations is an impact on the functioning of a socio-economic system is for the water regulation referred to "simply" in terms of costs.

The significance of the two elements for the Werra case is quickly shown: salinity thresholds that were previously authorised on the basis of BAT reasoning must now integrate flora and fauna in the calculation, unless it can be shown that the achievement of a good ecological status would entail disproportionate costs. If this appears as a straightforward criterion addressing RQ1, it is enough to consider the "softness" of the terms involved (basically BATNEEC and good ecological status) to appreciate the uncertainty surrounding any decisions on the matter.

A quick look at the ecosystem services provided by the Werra-Weser watershed may be the clearest way to clarify the complexity of the situation. The watershed encompasses:

[22] This argument is spelled out more in detail in Appendix 1, dealing with the legal framework. Several practitioners interviewed during the consultations (see Chapter 2, Section 2.2.1.) stress this point as well.
[23] See Case C-44/95: Regina vs. Secretary of State for the Environment, *ex parte* Royal Society for the Protection of Birds. The ruling concerns the expansion of the Port of Sheerness in the United Kingdom.

- Sink for K+S salt-rich refuse waters;
- Fishing ground (downstream);
- Recreation areas (also via tourism);
- Residential areas;
- Drinking water provision;
- Intrinsic and symbolic value of the river;
- Intrinsic and symbolic value of the landscape (affected by the salt heaps).

A diversity of social groups gathers around these uses: K+S; worker unions; industry associations; environmental NGOs; recreational groups; resident groups and the representatives of the involved administrations (at different levels, though without the EU). Obviously, each of these groups has a different opinion concerning the specific configuration of uses they would like the ecosystem to sustain. Given, furthermore, the degree of complexity and uncertainty briefly sketched above, each of these actors is in the position to enter a legal battle so as to pursue his/her own particular vision. The outcome of such legal battle will however be highly uncertain. The situation thus persists even though it can hardly be assumed that, in the end, the parties affected must be happy or "better off" with it.

As a matter of fact, none of the affected parties is "happy" with the situation as it is: they would take action so as to change it, but they are all presently held back by the threat of a long and very uncertain legal battle. For at least the last two decades, all actors have been "better off" by maintaining the status quo in a situation of stalemate. This equals however to choosing the lesser evil, rather than settling for a mutually beneficial arrangement.

While a more thorough analytical conceptualisation of this situation will be spelled out in Chapter 6, it is here sufficient to consider that nobody knows how long the lesser evil will still be so, nor anybody knows the degree to which the situation constitutes an incentive, for certain actors, to retaliate one way or another, within legality (e.g.:

protests, media campaigns) or not (sabotage). Plain and simple: current arrangements were so far better than a legal battle, but how long is this still going to be the case? As long as this is so, actors have made use of other ways of taking action on the matter, e.g. via protests. How is this going to develop? Here lies the essence of the Werra "conflict".

Given this situation, the Round Table is set up with a twofold decision by the state parliaments of Hessen and Thuringia dating mid 2007. Hessen had just adopted the same "tool" in the case of the Frankfurt Airport Expansion, making a positive experience. The state of Thuringia, instead, has been particularly proactive in experimenting with the participatory side of the European Water Framework Directive implementation process. Based on such experience and urged by the pending European Water Framework Directive implementation deadlines, the two states decided to set up the Round Table with the task of exploring possibilities for a durable reduction of the salinity of the Werra without compromising employment in the region[24].

5.1.2. The Constitution of the Round Table

The Round Table (further: "RT") was constituted on March 18, 2008 with the initiative of the states Hessen and Thuringia and of K+S. A Joint Declaration of the two state governments and of the company sets the objective of the RT: to bring representatives of the involved states, the company K+S, local administrations and environmental associations together with the aim of developing alternatives that harmonise the economic, ecological and social aspects of the extraction activities along the Werra. This encompasses the long-term sustainability of the disposal channels for the extracting activities, the improvement of the ecological situation of the Werra/Weser watershed, the conservation of the level of employment and the development goals of the region.

The constitution of a RT has the goal of ensuring that discussions concerning the Werra and the future of the local extraction industry take place on a sound and

[24] Source: Constitution of the Round Table.

factual basis. It also has the task of promoting trust and acceptance and of developing solid alternatives for addressing the issue. In order to do so, the RT aims at establishing a transparent, constructive and objective dialogue, aspiring to consensus and taking distance from the ongoing court litigation processes.

According to the Joint Declaration, the RT is expected to produce widely accepted recommendations. The measures to be examined and selected must be economically viable and technically feasible. The requirements of the European Water Framework Directive will have to be considered as well as the economic interests and the present level of occupation. The state administrations intend this way to pursue a sustainable economy and a careful use of natural resource for the decades to come, safeguarding jobs and reducing the pressures on the environment.

5.1.3. Process design

As a constitution, the Joint Declaration represents the fundamental basis for the RT's operations. There are however further sources determining the way the RT is structured and defining its design as a participatory process. Those sources encompass the four Annexes added to the Joint Declaration, respectively translating the Declaration in a codex of 8 basic rules (Annex 1), identifying Members and Observers of the Round Table (Annex 2 and 3, respectively) and determining the Codex of Operations for the Round Table (Annex 4).

Annex 1 shapes the characteristics of the process first of all by duplicating the contents of the Joint Declaration through four of its first eight articles (§1, §2, §3, §6). It goes however further by detailing out a few core aspects determining how discussions at the RT are to take place. The non-binding, recommendation-oriented character of the RT is for example anchored here (§4), as well as the "Principle of Consensus", allowing for majority rule and minority votes (§5). It also states that a draft Codex of Operations must be proposed from the Director of the RT and put to vote (§7). The Director of the RT has also the duty of representing the RT and speaking for it in front of the general public, as meetings are not public (§8).

Annex 2 and 3 respectively enlist the Members and the Observers of the RT. Annex 2 encompasses 25 nominees from the different involved organisations, three of which suggested by the Members themselves and nominated after the beginning of the process, a possibility foreseen by the Codex of Operations detailed out below (§4(2)). For all of them, Annex 2 also foresees individual substitute nominees, so that the presence of every group is guaranteed at every meeting. Same goes for the Observer as enlisted in Annex 3.

Annex 4 constitutes the Codex of Operations referred to by §7 of Annex 1. Differently from the Joint Declaration, the Codex of Operation has been elaborated by the Director of the RT and put to discussion and vote by the Members on the first official RT meeting. The original draft has been accepted with few changes almost unanimously (one vote against it, one vote not classifiable due to unclear status of the voting Member). The Codex encompasses 12 articles, re-stating objectives but further specifying those methods and ways of proceeding briefly laid down in the Joint Declaration.

Article 2 entails a working style for the RT. There, the Codex stresses explicitly that the work at the RT consists in bringing together different opinions: it is thus legitimate for participants to take part in the discussions explicitly on the basis of their own values and interests. Pre-condition for this is however the readiness to listen to other's point of view and to make an effort towards the achievement of common perspectives and goals (§2(1)).

A further, explicitly stated task for the participants is to achieve a recommendation with the broadest possible support. Participants must accept that their final recommendation has no binding character but that it will have the greater importance and acceptance within the public the broader the consensus at the RT will be (§2(2)). Participation is furthermore conditioned to the acceptance and respect of the working style laid down in Article 2. A trust-building approach to discussions is required, together with the careful handling of transparency and confidentiality issues (§2(3)). The RT commits itself to communicate its tasks, approaches and results in a transparent way (§2(4)).

Article 3 regulates closely the roles of the Direction and of the Scientific Support of the RT. The Director is responsible for the organisational aspects of the meetings of

the RT (minutes, circulation of information, communication with the public etc.) executes its decisions and nominates a Scientific Support (§3(1) and §3(2)). The Scientific Support is instead responsible for the technical and scientific aspects of the RT's work. It collects, sorts out and circulates the relevant information and undertakes the necessary assessments and analyses, either directly or via agreed third parties (§3(3)).

Article 4 details out the criteria and the process behind the composition of the RT. A series of institutions is identified by the organisations supporting the RT, hence by the two state administrations of Hessen and Thuringia and by K+S. Those organisations can then suggest specific individuals as their own representatives as well as substitutes (§4(1)). The identified individuals are then nominated as RT Members and act within it on a personal basis. Their relationship to their respective home institutions is not altered by their participation nor can home institutions be held responsible for the actions of a Member related to his/her work at the RT (§4(3) and §4(4)). The Round Table also has the possibility to add three further organisations to its composition. The nomination of the corresponding new members must be put to vote and obtain at least a 2/3 majority. The same procedure applies in case of substitutions during the process (§4(2)).

The composition of the RT is complemented by the Observers (as enlisted in Annex 3) as well as by the participants to Working Groups and Experts. Their participation and status are regulated in Article 8. Observers are nominated by the state administrations Hessen and Thuringia. They are allowed to take part to the discussions but do not have the right to vote (§8(1)). Working Groups can be summoned upon majority vote by the RT and serve for the preparation of specific decisions (§8(2)). Experts may also contribute their expertise in particular decision situations. The selection of Experts shall be based on professional experience and acceptance (§8(3)). The working style laid out by Article 2 applies to Observers, Experts and participants of Working Groups alike (§8(4)).

Article 5 regulates the meetings. In its first three paragraphs (§5(1), §5(2) and §5(3)), the article entails prescriptions concerning invitations and agenda-setting (deadlines for calls, circulation of the agenda in advance, approval of the agenda as first topic of each meeting etc.). Its last two paragraphs instead determine the communication

policy concerning the meetings, building on what prescribed by the Annex 1 on the matter (§8 Annex 1: meetings are not public, communication towards the outside is a task of the Director). Specifically, Paragraph 4 foresees that specific meetings can be opened to the public upon suggestion of the Director and majority vote (§5(4)), while Paragraph 5 gives the Director the possibility to invite guests and experts to meetings. Alternatively, a majority vote suffices (§5(5)).

The possibility for the RT to take decisions during its meetings is regulated in Article 7. In particular, the general rule is that decisions are taken by majority vote, provided at least half of those eligible to vote (that is, Members or their substitutes) are present and the meeting has been announced regularly. The discussions at the meetings are furthermore documented via minutes, as foreseen by Article 6. Minutes contain only the results of the discussions and present the Members' individual positions only if they request so (§6(1)). Minutes are amended and approved at the next meeting (§6(2)) and are subsequently made publicly accessible (§6(3)). Any other communication with the general public is a duty of the Director of the Round Table, as laid out in Article 9.

Finally, the above regulates the way the Members formally interact during the meetings at the RT. Attention is due to the way the Director goes about his role of organising the meetings as foreseen by the Codex of Operation (§3 Annex 4). The way meetings are prepared and information is collected, circulated and discussed off and between the meetings represents a further possibility for interaction among Members. It thus constitutes a non-negligible aspect of the process design characterising the Round Table. In compliance with the Codex of Operations, the Director has hired a communication bureau to serve as a secretariat and intermediate on these matters. Through the secretariat, an internet platform has been established where the members, by the means of a password-protected area of the RT's website, are able to retrieve information and discuss specific topics. The internet platform is an important tool complementing the discussions at the meetings as it has been used to support the selection of alternatives.

The RT screened about 30 individual measures addressing the salinity problem at the Werra. The technical information concerning those measures was concentrated in technical fact-sheets which were commented and discussed over the internet in

preparation of the meetings. Unfortunately, this pool of information was not accessible in light of confidentiality and business-secret considerations and has been mentioned here for the sake of completeness only. The analysis that will follow in Chapter 6 will therefore focus on the final decision between the few alternatives that passed the internet-based screening. As we will show later in the text, the events unfolding during the process by-passed most of the mutual comparison of alternatives per internet-based interaction. What remained to be compared took place almost exclusively during the meetings and is therefore sufficiently documented via the minutes and the interviews.

Furthermore, the Director has used the website of the RT in order to fulfil the communication duties he is entrusted with. Beside publishing the minutes of the meetings, the publicly accessible part of the website has hosted a wide selection of information materials concerning the salinity issue, the documents referred to in meetings and decisions and the several studies and assessments commissioned throughout the process. Press releases where issued whenever a key event within or outside the RT took place. Similarly, a bulletin was published at regular intervals, summarising the state of the discussion while, finally, excerpts from the press where published on a monthly basis.

The dimension of communication and information disclosure does not represent a direct way of interacting between Members. It constitutes however a relevant characteristic of the process because it represent the only official link between what happens at the Round Table and the public at large. To the extent at least one Member has a stake in what is communicated to the general public, communication towards the outside becomes an indirect way of interacting with that Member via the group to which that Member refers to. This is more so if one considers that Members are not allowed to communicate other Members' positions and opinions on what is discussed at the Round Table, nor do the minutes normally reveal the sources of the arguments they report.

The chosen communication policy basically allows Members to discuss anonymously towards the general public. It thus withholds a certain amount of information. By doing so it can at least hypothetically impair the ability of individual Members to fully justify their individual position and the collective outcomes of the discussion towards

the outside. We will elaborate on this aspect later in the analysis, as we will deal with Politics and with the role of Representatives (See the analysis of the first round of interviews in Appendix 4, Subsection A4.1.3.5). For the moment it is enough to characterise the setting where the Members of the Round Table discuss and approach the Werra situation as we have done above. Against this background, we will now introduce the alternatives that the Round Table has taken under consideration.

5.1.4. Alternative options considered

That "nothing falls under the (Round) Table" is a recurring motive.[25] It shows the intention to explore whatever solution may contribute to achieve the objectives stated in the Joint Declaration. This also implies that the number and heterogeneity of the possible pathways to be explored can be expected to be high if the RT intends to live up to its intentions. In the following, we document the steps that were undertaken so as to identify a manageable range of options for addressing the Werra's salinity problem.

Starting point for the selection of measures was the output of a prior pilot project conducted between 2005 and 2007 by the Hessen State Administration in cooperation with K+S and several environmental NGOs. The output of the project was a catalogue of measures possibly allowing for the achievement of a good ecological status as required by the European Water Framework Directive (Schädlich 2007). The set of measures thereby collected was updated by K+S and later on integrated via proposals from the public, resulting in a list of almost 30 individual measures to choose from. Technically speaking the individual measures encompassed three main categories: 1) optimisation of the extraction and transformation processes; 2) local disposal and 3) long-distance disposal. A purely logical fourth category involving the dismissal of the extracting activities was excluded from the decision process.

[25] Source: RT press release on June 25, 2008.

Based on the information collected in the technical sheets corresponding to each measure, a classification based of the different measures' expected effectiveness, implied time-scale and financial costs allowed for clustering. Four categories emerged, labelled A to D and respectively encompassing: A) feasible, effective measures; B) feasible measures producing effects in the long term only and possibly leading to technical realisation problems; C) feasible measures which are either already underway or that will lead to negligible additional effects; D) economically, technically or juridically not feasible or not effective measures. The clustering allowed to reduce the total number of measures by one third (11 measures dropped because in category C or D), while within the remaining, the results of the classification process (see Table 5.1) could isolate a few promising options for further exploration: the transportation to the North-Sea via pipeline and a series of technical improvements in the production and processing facilities. From this point on, the events taking place in and around the RT took the lead of the further selection process.

Category A		**Category B**	
1	Further ESTA-facility in Hattorf	1	Withdrawal from potash-sulfate-based fertilizers
2	Cooling down of wastewater	2	ESTA-process underground with underground relocation
3	Desalination process	3	Recycling of the salt heaps
4	Relocation underground	4	Capture diffuse pollution in Breitzbachsmühle
5	Underground disposal	5	Covering/greening/flattening the salt heaps
6	Transport to the North Sea	6	Covering the salt heaps (several processes)
		7	Biomass production via halophile Algae
		8	Pumping out of underground layers

Table 5.1 – Measures in Category A and B.

5.1.5. Events during the process

Table 5.2 below provides a list of the RT meetings, including both meetings in the formal sense and working groups (§8, Codex of Operations). Along with the list of meetings, specific events are reported that have changed the terms of the discussion

at the RT. The first of such events was the presentation of the Measures Package (*Maßnahmenpaket*) by K+S, closely followed by the Public Law Agreement (*Öffentlich-Rechtlicher Vertrag*) between K+S and the two State Administrations Thuringia and Hessen. The next turn in the process takes place instead with the presentation of the Strategy Paper by K+S and the related Integrated Measures Concept. As shown in Table 5.2, we thus distinguish three phases: Phase 1 (from Meeting 01 to Meeting 08), Phase 2 (from Meeting 09 to the Working Group on Scenarios 02) and Phase 3 (from Meeting 12 to the final Meeting 16).

During Phase 1, the process aimed at identifying a feasible set of solutions for the salinity problem unfolds along the lines sketched above. An initial catalogue of technical measures is reviewed and complemented through the knowledge available to the RT Members. Working groups take place so as to address specific questions and approach a clustering of viable solutions and intervention packages. By the time Phase 2 begins, the process of analysing the catalogue of technical intervention and collectively reviewing the individual measures is at an advanced stage. The presentation of the Measures Package produces a sudden change in the selection process.

The Measures Package presented by K+S encompasses a series of interventions optimising the production processes within the several facilities operated by K+S. It involves investments for about 350 Million EUR. By then, the RT was operating since about six months, though the representatives of K+S made no mention of this plan of theirs. The official narrative put forward so as to justify the secrecy behind the package was that research and optimisation are an ongoing process at K+S, and they didn’t stop because of the company’s involvement in the RT. Furthermore, the Package could be unveiled only when specific technical solutions were available, providing certainty to the realisation of the Package. Unveiling work in progress would have instead harmed the company’s competitiveness.

Label of the meeting	Date	Key Event
Phase 1		
Meeting 01	March 18, 2008	Start of the works; Constitution
Meeting 02	April 15, 2008	
Meeting 03	May 24, 2008	
Meeting 04	June 24, 2008	
WG Measures 01 ("*AG Maßnahmen 01*")	August 7, 2008	
WG Technological State of the Art ("*AG Stand der Technik*")	August 11, 2008	
Meeting 05	September 2, 2008	
WG Measures 02 ("*AG Maßnahmen 02*")	September 18, 2008	
Meeting 06	October 21, 2008	
Meeting 07	November 12, 2008	K+S Measure Package
WG Scenarios 01 ("*AG Szenarien 01*")	December 11, 2008	
Meeting 08	January 13, 2009	
Phase 2		
Meeting 09	January 28, 2009	Public Law Agreement
Meeting 10	February 24, 2009	
WG Measures 03 ("*AG Maßnahmen 03*")	March 26, 2009	
Discussion Meeting April 15 ("*AG Diskussionsrunde 15.4.*")	April 15, 2009	
Meeting 11	April 21, 2009	
Symposium Salinity ("*Fachgespräch Versalzung*")	April 27, 2009	
WG Scenarios 02 ("*AG Szenarien 02*")	May 7, 2009	
Phase 3		
Meeting 12	May 26, 2009	K+S Strategy Paper
WG Scenarios 03 ("*AG Szenarien 03*")	June 4, 2009	
WG Pipeline/NIS ("*AG Fernleitung/NIS*")	June 25, 2009	
Meeting 13	July 7, 2009	
Meeting 14	August 31, 2009	Retreat
WG Salinity Thresholds ("*AG Härtegrenzwert*")	September 25, 2009	
WG Pipeline ("*AG Fernleitung*")	October 19, 2009	
Meeting 15	November 10, 2009	Int. Measure Concept; Pre-vote
WG NIS ("*AG NIS*")	January 26, 2010	
Meeting 16	February 9, 2010	Recommendation
		Legend WG: Working Group

Table 5.2 – Meetings of the Round Table.

From the minutes of Meeting 07, we know that the document unveiling the Package was released on a very short notice (the day before the meeting). We also read that the Package itself has been received with a mixed feeling within the RT. On one hand, it takes up the measures clustered in Category A (see Table 5.1 in the previous subsection) almost entirely. This circumstance is viewed positively. On the other hand, the secrecy behind the Package's development and communication has severely undermined the level of trust towards K+S among RT Members. What is more, Package encompasses measures, that are either limited to zero-cost interventions or that create value added. The minutes reveal how this circumstance undermines the credibility of K+S rhetoric of long-standing commitment towards an environmentally friendly production. Through the Package, K+S appears to react to profit, while tackling the salinity issues in the Werra is thereby a by-product at best (WG Scenarios 3, June 4 2009, pg. 7)[26].

From this point on, the problems connected with the alternative disposal channel of injecting salt water in the underground gains prominence on the agenda. In the very same Meeting 07 (November 12, 2008, pg. 4), the insight is officially put forward, that the underground layers are not as water tight as they were believed until 2006, when the last permit was issued. The renewal of the permit is at risk and K+S is to show a path towards a zero-injection (*Null-Versenkung*) arrangement. Two months later (Meeting 09), a Public Law Agreement between K+S, Hessen and Thuringia is signed, binding K+S to provide a list of short term measures and a Strategy Paper by mid 2009. K+S is also to produce an Integrated Measures Concept (*Integriertes Maßnahmenkonzept*) by late 2009. The agreement is negotiated and signed outside the RT, solely between Hessen, Thuringia and K+S. In the agreement the counterpart for K+S's commitment is a legal framework which doesn't yet grant but allows for a temporary continuation of the injection practice beyond the permits.

A later legal assessment considers the agreement void, a circumstance which is likely to be known back then by the lawyers involved in drafting the agreement[27]. A void agreement has no legal value: it is as if it never existed. The RT Members took it however for valid and had to cope with the consequences that both the Agreement and the Package jointly had on the decision process. From this point on, the Package

[26] On this issue, see also the findings of the 1st round of interviews concerning K+S (Appendix 4, Section A4.1.3.1.).
[27] Personal communication by a legal expert involved in the abovementioned assessment.

belongs to the status quo, implying that the task for the RT is to explore solutions for what the Package does not achieve, taking the Package itself for given and contributing knowledge to the drafting of both the Strategy Paper and the Integrated Measures Concept. The Package “happens” to coincide more or less with those intervention catalogue the RT has identified with Category A (see Table 5.1 above). With this step, the desirability of the Package itself and of the relative extent of its individual elements are however taken away from the judgement of the RT. This is the status quo with which the RT enters Phase 2.

During Phase 2, the work on the fact sheets is accomplished and several assessments are commissioned in order to clarify specific aspects of given measures. This includes the development of a computational model producing salinity prognoses on the basis of different intervention scenarios and variable conditions. This knowledge is sought after so as to allow for an evaluation of the different options available. Given that the status quo now includes the Measures Package, the effort of the RT is concentrated towards assessing its effectiveness and screening for necessary additional measures. From Phase 2 onwards, two measures become the centre of discussion: a pipeline to the North Sea and the fate of the injection practice.

The Strategy Paper marks a second turning point in the discussion. Core outcome of the debate during Phase 2 is (simplifying) that a pipeline is necessary in order not to preclude the achievement of a good ecological status. At the same time, the end of the injection practice causes an increase of the amount of waste water to be disposed of in the Werra. Several years are necessary before the pipeline is operative, leading to a new issue: a temporary increase in the salinity of the Werra caused by the time gap between the end of the injection practice and the realisation of the pipeline. Such an increase is unwelcome under many respects. In particular, the EuWFD forbids the worsening of the ecological state of a river. The EuWFD also allows for a postponed achievement of the good ecological status only under the condition of showing a pathway towards the achievement. In more general terms, it would have been difficult to communicate an increase in the salinity of the Werra as the outcome of the work of the RT.

The Strategy Paper is expected to address this issue, making use of the insights gained through the work of the RT. The release of the Paper is however met with disappointment by most members at the RT. Reason for this is the introduction of the New Integrated Salt Management (labelled "NIS" from the German *"Neue Integrierte Salzsteuerung"*) and its relative weight compared to the prospects of the construction of a pipeline. Through the Strategy Paper, K+S presents a scenario where the Measures Package is complemented with a different injection technique (the NIS), expected to bring down the salinity of the Werra from the current 2.500 mg/l to about 1.700 mg/l. The option of a pipeline can be explored in case either NIS or the Measures Package prove less effective than expected.

Most members in the RT appeared puzzled by this proposal. When the underground has been proven unsuitable as a sink for saltwater, K+S proposes to use it as a filter, pumping salted water into the soil while pumping less salted water out of it at a different location. Furthermore, K+S prospects a scenario where both the underground and the Werra are exposed to environmental pressure in the long term, basically until the salt mines are exhausted and K+S ceases its operations in the area.

Even more puzzling is the fact that, despite the criticism, K+S maintains this approach in the Integrated Measures Concept. The Integrated Measures Concept has been presented in November 2009, at a session which was supposed to conclude the works of the RT. A voting was held on that day, returning 15 votes in support of the recommendation, 3 votes against it and 6 abstentions. This voting had however a preliminary character. The press release that followed announced the "disappointment" of the Director of the RT towards the attitude of K+S and the continuation of the works for a few more months. A final voting was held on February 9, 2010. The draft recommendation put to votes returned 22 votes in favour, 3 votes against and no abstention. To that recommendation we turn in the next subsection.

5.1.6. Decision output and critical reflection

The output of the RT process can be summarised with the following:

- All available technical means should be employed now so as to optimise the current production processes and reduce the current production of wastewater by nearly 50%;
- The disposal of wastewater in the Werra and in the underground should be dismissed as soon as possible and no later than by 2020;
- The planning and realisation of a pipeline to the North Sea shall start now;
- Available technologies, including the NIS, shall be further explored and adopted as soon as possible so as to reduce the disposal in the Werra of wastewater whose production cannot be avoided through optimisation measures.

The recommendation text also reports the following minority votes:

- The representatives of Hessen, of the workers' unions and of the municipalities hosting the production facilities will accept a continuation of the disposal into the Werra if the recommended solutions fail for reasons beyond the responsibility of K+S;
- Niedersachsen and the Association of Fishers of Niedersachsen oppose the construction of a pipeline into the North Sea;
- Environmental NGOs and further civil society groups welcome the end of the injection practice in Thuringia and will not accept its continuation in Hessen beyond 2015.

Finally, the recommendation text reports three important concluding remarks:

- The RT recommendations aim at creating the necessary preconditions for an ecological betterment of the Werra-Weser watershed; they are however not sufficient for that betterment to be achieved, so that further measures have to be addressed within the compulsory management plan of the River Basin District;
- The RT recommendations are meant to achieve socio-economic goals at societal level; they are not meant to achieve K+S's managerial objectives as these do not belong to the sphere of judgement of the RT;
- The implementation of the recommendations lies mainly in the hands on K+S; authorisation processes will be necessary and political support will be needed; the implementation is also likely to be followed by lawsuits.

With the above, the RT endorses the Measures Package by K+S and further recommends the construction of a pipeline to the North Sea. It also accepts the continuation of the injection practice and the disposal on salt heaps as temporary measures during the construction time of the pipeline. Finally, it recommends to further explore alternative disposal channels and additional optimisation options so as to move away from injection and salt heaps as soon as possible.

This decision output has obtained a large majority (22 of 25 votes in favour). After two years of discussions, 22 Members of the RT agreed on the fact that the disposal of salt-rich wastewaters in the Werra watershed has to end, and that includes both surface and underground waters. They also agreed that K+S has to do everything in its powers to avoid producing those wastewaters by improving its production processes, and that the best thing to do with the remaining, unavoidable, wastewaters is to bring them per pipeline to the North Sea. Finally, they acknowledge

the urgency of dismissing the current injection practice but allow it to proceed as long as the pipeline is under construction, provided it is indeed underway.

The size of this majority is certainly impressive and would suggest that the overall arrangement will indeed move in the direction sketched by the recommendations. A careful reading of the minority votes provides however a different perspective as they set a specific mechanism into motion. First, regardless of the assessments made and of the discussions held at the RT, Niedersachsen rejects the construction of the pipeline. Niedersachsen has held this position from the very beginning of the process: the first statement in this regards dates back to Meeting 02 (April 15, 2008). There will be no pipeline without the approval of Niedersachsen. This means that, at the state of things, there will be no pipeline.

Second, there is a broad front that would accept the continuation of the disposal of wastewaters in the Werra in case the recommended measures (e.g. pipeline) fail for reasons not amenable to K+S. The pipeline solution formally fails because of Niedersachsen, not because of K+S. The front at stake includes the upstream municipalities and, most of all, the Hessen State Administration. Taken by the word, Hessen is likely to further authorise the disposal of salt-rich wastewater into the Werra, meaning that neither a good ecological status will be achieved, nor a pathway towards it will be laid down in the foreseeable future. If this is the case and we take the regulations by the letter, we can either expect the intervention of the EU or a complaint filed by any environmental NGO at the European Court of Justice against the Member State Germany for failing to implement the EuWFD.

The RT process may represent a political success, due to the broad majority supporting its recommendations. Under this latter perspective, however, it has substantially failed: if the above holds true, the process around the RT has not proven successful in identifying a viable alternative arrangement, capable of being implemented or even likely to be implemented. Furthermore, K+S rejects the recommendations as well. Three core reasons are brought forward in a written statement: the missing consensus among the state administrations, the missing assessment of the feasibility of the recommended measures from the point of view of the company and the disproportion between the costs of the pipeline solution and its

effectiveness. K+S holds instead to the position that the NIS is a feasible option for the long term and that the abatement thus provided is sufficient.

Regardless of the truthfulness of these points, which mechanism do they set into motion? K+S does not intend to bear the costs of constructing the pipeline and intends, instead to invest into a process (the NIS) which, without a pipeline is not going to be authorised. K+S can therefore expect to lose the possibility to inject wastewaters into the underground and will at best be only able to rely on the Werra as a sole channel for disposal. The EuWFD forbids a worsening of the river's ecological status, so that the current salinity thresholds effectively become a cap to the level of production. Considering that, as of today, the injection practice is the disposal of choice for 7 of the 14 million tons of waste produced each year, a significant decrease in the level of industrial activity can be expected.

The presence of fixed costs makes it furthermore unlikely that the profitability of the facilities reacts linearly to the decrease in production. Simply put, a halved production leads to halved revenues on the one hand, to higher-than-halved costs on the other. This reduces profitability[28]. If the company reacts to profitability (and that is likely, given the above), some facilities may close and some layoffs may follow. Additionally, the company may face additional legal expenses and possibly liabilities, further worsening its situation. How can the company consider this as the best thing to do under the circumstances?

Certainly, the scenario above relies on a strong interpretation of the letter of the process's output. A similarly strong interpretation may or may not prove right. Weaker interpretations, softening the meaning of the statements presented above, may indeed open spaces for different outcomes not involving layoffs, foreclosures, fines and a continued environmental pressure on the watershed. No matter how weak or strong the different statements are to be read, we will avoid at this point to merely speculate on likely outcomes and turn to the interview and written materials we have collected all along the RT process.

[28] Profitability is a ratio between revenues and costs. If revenues are greater than costs, such ratio is greater than one.

5.2. Insights from the materials

We have first heard about the RT in late 2008. At that point in time, five Meetings and three working groups had already taken place. Approaching the Direction of the RT and the steering group proved time-consuming, so that we first obtained official support by mid 2009. We could then conduct two rounds of interviews in the second half of 2009. The timing of the interviews and the fact of starting our observations from the middle of the process were not too convenient, particularly if compared to the phases that characterised the process, as shown in Figure 5.1. Luckily, the interview materials could be complemented by written statements provided by the RT Members at the beginning of the Process. All Meetings and Working Groups were documented and the minutes are publicly available through the RT website[29].

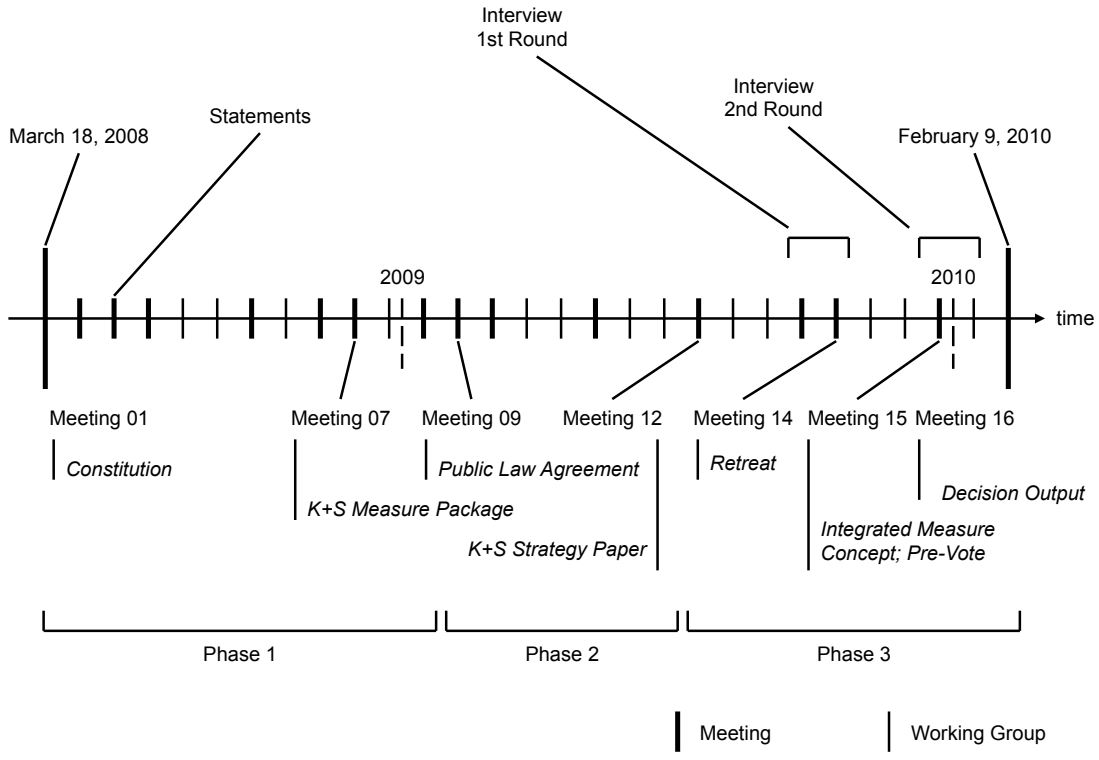


Figure 1 - Timeline of the research design

Figure 5.1 – Timeline of the research design.

[29] www.runder-tisch-werra.de.

All materials (minutes, statements, interviews) were processed in a twofold way: deductively and inductively. A deductive coding was performed on the materials, scanning for those dimensions and characteristics identified via the theoretical exploration presented in Chapter 3. Approaching the materials through the lenses of our theoretical framework would have however left the richness of the materials unexplored. This led us to approach the same materials also in an inductive way, attempting to extract regularities from observation. This is indeed opposite to postulating regularities through reasoning (theories) and testing the corresponding expectations through observation, as one commonly does via deduction.

In the following, we will concentrate on the inductive approach and achieve a mainly descriptive presentation of the materials, leaving the deductive, analytical approach to the following chapter. The remainder of this chapter will thus organise our observations and search for counterintuitive, non self-evident properties of the RT process. The materials are presented as follows: we will first introduce the statements produced by the RT Members at the outset of the process; we will then move to the minutes of the meetings and subsequently turn to the interview materials, distinguishing first and second round.

For each of those sources, we will first provide background, methodological information on the way the different materials were collected and treated. Subsequently, paradigmatic quotes introduce the reader to the perspective we have achieved on the materials. A final subsection summarises the observations we have collected from the given materials and derives insights for the Werra case. Detailed analyses of the text and interview materials can be found in Appendix 2 to 4 respectively. The interview guidelines can be found in Appendix 5.

5.2.1. Statements

5.2.1.1. Characteristics of the materials

At the beginning of the process, RT Members were requested to produce a written statement specifying one's own position on the salinity issue and one's expectations towards the process. The RT Members approached the task rather differently, either

handing in documents drafted within their organisations, drafting documents on a personal basis or a mixture of both approaches.

According to the RT's statute, they all participate on a personal basis (§4(3) Codex of Operations, see Process Design in 4.1.3.2.). It is therefore somehow puzzling that official documents were handed in. What we can however read from this circumstance is that the respective official document possibly represents the term of reference for the individual Member approaching the discussions at the RT. We can read it as a choice of letting aside personal judgements and explicitly refer to the state of things from the perspective of the home organisation.

Not all Members handed in a statement. Reason for this is that some Members were nominated slightly later in the process and thus skipped this first exercise, while other produced a statement in the form of an opening speech on the first Meeting, thus part of the minutes analysis. Also, some submitted electronic text documents, while other apparently faxed or scanned their statements. Time constraints didn't allow us to re-type all non-text submissions, so we chose to do so only for those Members that we also interviewed.

Eventually, we gathered a bundle of 17 individual statements, ranging from about a hundred words to almost 1.500. Each of them was coded in an iterative process, distilling the topics addressed by the interviews. The list of topics thus produced can be seen on Table 5.3, together with relative and absolute frequencies (N=17)[30] and frequency thresholds on the percentile distribution[31].

[30] By Frequency we generally mean the number of times a certain topic appears. In this table, the European Water Framework Directive (topic 'EuWFD') appears in 13 statements out of 17, yielding a relative frequency of f=13/17=0,76. This means that 76% of all initial written statements mention this topic. We chose to provide the absolute frequency (13) as well in order to remind the reader that we deal sometimes with very little numbers. Simply reporting the relative frequency would leave this detail out of sight.

[31] Given the very high number of topics, it is often necessary to limit the analysis to the top results. Choosing however the three, five or ten topics with the highest frequencies would lead to a treatment of the results which is biased towards shorter lists: for example, analysing the top 5 topics of a list of 10 topics would mean to address half of the list, while doing the same for a list of 20 topics would mean to address only a quarter of it. We therefore subdivided the every table using frequency thresholds, obtained as the 90th and the 75th percentile of frequency sets thereby provided. This allowed us to homogeneously yield the top 10% and top 25% most mentioned topics of every specific list. It is normative to settle for the top 10% or 25% of all topics. This is unavoidable. What is however important is that this applies homogeneously across all tables presented.

No.	Topic	Frequency	Freq. Thresholds
1	EuWFD	0,76 (13)	
2	Salinity thresholds	0,76 (13)	
3	Watershed quality	0,65 (11)	
4	Balance economy/ecology	0,59 (10)	>90-Percentile (0,53)
5	Groundwater & injection practice	0,53 (9)	
6	Transparency	0,53 (9)	
7	Jobs	0,41 (7)	
8	Production/waste ratio	0,41 (7)	>75-Percentile (0,35)
9	Emissions	0,35 (6)	
10	Future generations	0,35 (6)	
11	Salt heaps	0,35 (6)	
12	Time pressure	0,35 (6)	
13	Costs	0,29 (5)	
14	Drinking water provision	0,29 (5)	
15	100 years of salt extraction	0,24 (4)	
16	German reunification	0,24 (4)	
17	Objectivity	0,24 (4)	
18	Other disturbances	0,24 (4)	
19	Pipeline (Neuhof-Werra)	0,24 (4)	
20	Regional Economy	0,24 (4)	
21	Werra degradation	0,24 (4)	
22	Environmentally friendly disposal	0,18 (3)	
23	Fish population	0,18 (3)	
24	Other measures	0,18 (3)	
25	Pipeline (North Sea)	0,18 (3)	
26	Production processes	0,18 (3)	
27	Production side effects	0,18 (3)	
28	Tourism	0,18 (3)	
29	2020 deadline	0,12 (2)	
30	Feasibility	0,12 (2)	
31	Participation	0,12 (2)	
32	Water law vs. mining law	0,12 (2)	
33	Competitiveness	0,06 (1)	
34	Debate on Werra salinity	0,06 (1)	
35	Diffuse pollution	0,06 (1)	
36	Effects on the North Sea	0,06 (1)	
37	Environment	0,06 (1)	
38	Investments since 2000	0,06 (1)	
39	Profits	0,06 (1)	
40	Taxes	0,06 (1)	
41	Wastewater Re-Extraction	0,06 (1)	
42	Water Hardness	0,06 (1)	
43	Worldwide food production	0,06 (1)	
44	Worldwide R&D	0,06 (1)	

Table 5.3 – Topics mentioned in the initial statements.

Absolute frequencies in parentheses (N=17). See footnotes 30 and 31 for methodological explanations.

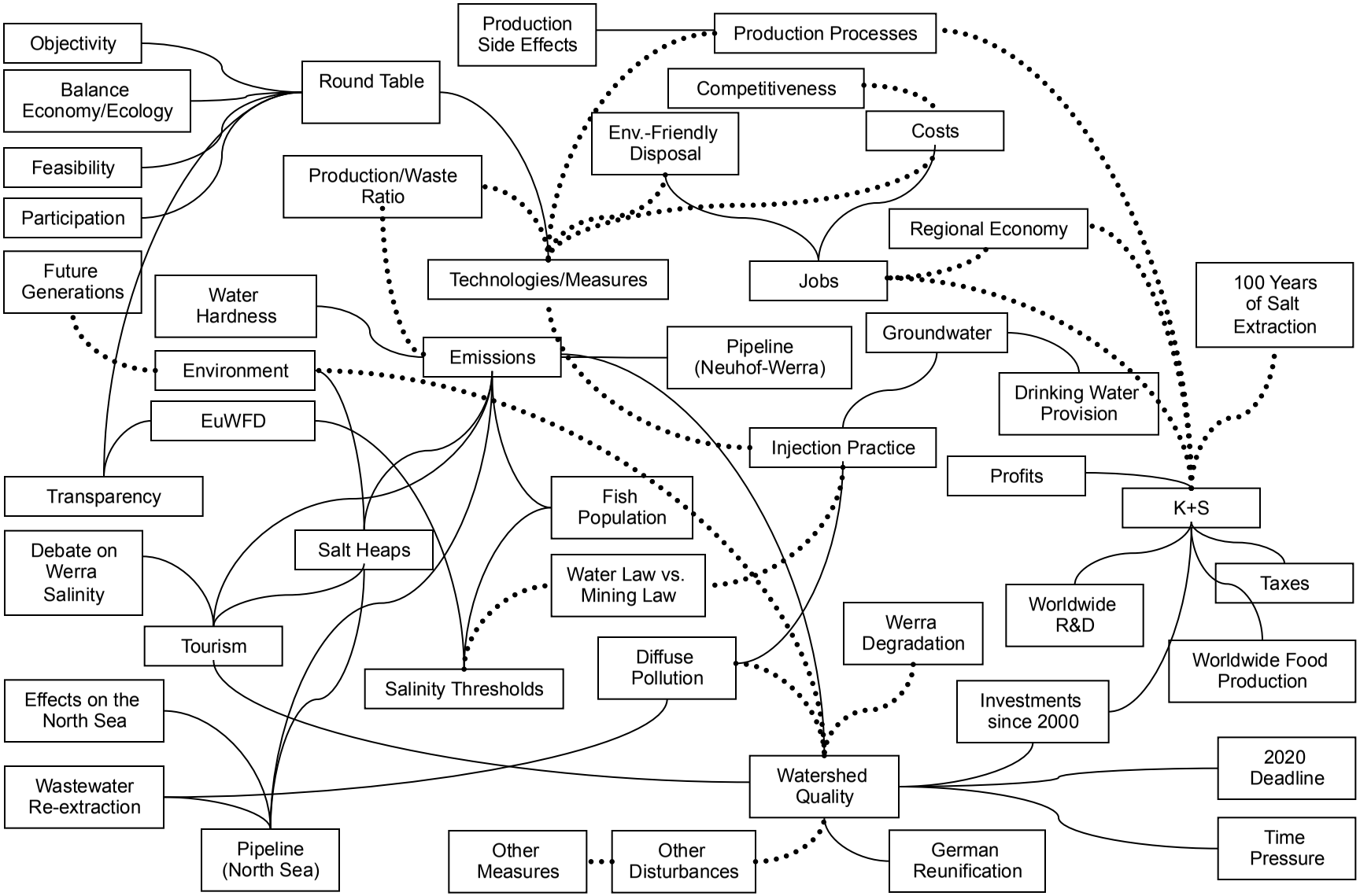


Figure 5.2 – Topics mentioned in the statements and corresponding relationships.

From the statements we derive clues concerning both the understandings the RT Members have of these topics and how these topics connect to one another in the accounts they provide. Figure 5.2. constitutes a graphical representation of the network of relationships thus emerging. In the figure, the solid lines represent explicitly mentioned relationships, while the dotted lines represent those (basic) relationship that can safely be assumed as understood or self-evident.

The core insight we gain from projecting the system emerging from the statements is that the Members deal indeed with a complex system and thus face decisions producing a multiplicity of effects on a variety of dimensions. This said, we will not proceed by formalising the different relationships at play, so as to explore the behaviour of the system. Instead we will turn to the statements, so as to gauge how the RT Members themselves approached (and reduced) the complexity of the matter.

5.2.1.2. Paradigmatic quotes

> "As the EuWFD requires a good ecological status for all water watersheds, this applies to Werra and Weser too. The process of achieving this goal (…) is now a task for the RT" (Municipality of Gerstungen)[32].

> "The Werra finds itself in a clearly better condition compared to the situation at the time of the German reunification. The salt input of up to 40.000 mg/l due to the potash industry of the GDR could be brought down to the level of 2.500 mg/l valid since 1942. This happened on the basis of an administrative agreement between the States Bremen, Hessen, Niedersachsen, NRW, and Thuringia and the Federal Government. The Federal Government provided a significant financial support (more than 64

[32] Original text: *"Da die EU-Wasserrahmenrichtlinie bis zum Jahr 2015 einen guten Zustand für alle Gewässer fordert, gilt dieses auch für Werra und Weser. Vorgehensweise und Werdegang zur Erreichung dieses Zieles (...) ist nun Aufgabe des Runden Tisches".*

Million DM). Nonetheless, the watershed system is still degraded" (Federal Government)[33].

"The RT offers to our generation a unique chance to harmonise the interests of the potash production including its very important jobs with the interests of the at least equally valuable protection of drinking water, nature, watershed and infrastructure" (Municipality of Gerstungen)[34].

5.2.1.3. Overview of the observations

At the beginning of the process, RT Members were requested to produce a written statement specifying their own position on the salinity issue and one's expectations towards the process. The topics most frequently referred to in those statements are: a) the European Water Framework Directive, b) the allowed salinity thresholds, c) the overall watershed quality and d) the balance between economy and ecology (together with the employment issue).

Concerning the EuWFD, RT Members refer mostly to the good ecological status and to the time pressure connected to meeting the directive's deadlines. At this stage, neither delays in the implementation nor less stringent environmental goals are mentioned. The achievement of a good ecological status is put in direct connection with the salinity thresholds, which are up for renewal and whose lowering seems necessary for any ecological improvement to be achieved, albeit at the cost of threatening employment.

The latter point is dealt with at length in the statements, under the umbrella term of sustainability. A closer look at the terms of the trade-off between ecology and

[33] Original text: *"Die Werra befindet sich gegenüber der Situation zur Zeit der Wiedervereinigung in einem deutlich besseren Zustand. Die Belastung aus der Kali-Industrie der DDR von bis zu 40 000 mg/l konnte auf der Grundlage eines Verwaltungsabkommens von 1991 zwischen den Ländern HB, HE, NI, NRW und TH sowie dem Bund unter erheblicher finanzieller Beteiligung des Bundes (mehr als 64 Mio DM) auf den seit 1942 geltenden Wert von 2500 mg/l gesenkt werden. Dennoch ist das Gewässersystem noch immer als degradiert zu bezeichnen"*.

[34] Original text: *"Der Runde Tisch bietet unserer Generation die einmalige Chance, die Interessen der Kaliproduktion inklusive ihrer sehr wichtigen Arbeitsplätze mit den Interessen des mindestens ebenso wertvollen Schutzes von Trinkwasser, Gewässern, Natur und Bauwerken weitgehend in Einklang zu bringen"*.

economy reveal that the real trade-off is between ecology and employment, and that the latter is a direct function of the competitiveness of K+S. The resulting frame of mind is one where concessions to ecology come at the cost of a lower competitiveness for K+S, which in turn is believed to cause a loss of jobs.

Furthermore, the trade-off is not a trade-off: it is rather so that ecological goals are conditioned to the level of employment, which is at least to be kept constant and which is not allowed to decrease. Statements are not necessarily internally consistent on this matter. For the details of the analysis that led to these interpretation, please refer to Appendix 2.

5.2.2. Minutes

5.2.2.1. Characteristics of the materials

The section on process design above has stressed the role granted to information disclosure and communication (see section 5.1.3.). While the meetings of the RT are per se not publicly accessible, the minutes of the meetings are publicly available through the RT website, once approved. The minutes, constituting 2.600 words long texts in average, represent a rich source of information on the characteristics of the debate taking place at the RT. In the following, we intend to characterise these discussions based on the publicly available minutes, encompassing the records of the proper Meetings as well as those from the Working Groups, for a total of 28 texts[35].

The minutes do not report the discussions word by word. Instead, they wrap up the arguments and reproduce the terms and developments of the debates. By doing so, they hide the information on who is raising which argument. This happens however only in part: speeches, presentations and relative question-and-answer are for example reported with the reference to the speaker. The same happens when participants express a wish to be quoted by name.

[35] As anticipated above, the minutes of the last meeting came too late for being considered in this work.

The implication for the purposes of this work is that the information on who says what is not completely lost, particularly when participants come to the forefront of the debate so as to voice their point of view. We have therefore information on the arguments specifically raised and supported by the Director of the RT, by the Scientific Support, by the states of Hessen and Thuringia (as organisers of the process), by K+S and by the invited guest speakers and experts (see Process Design in 5.1.3.). The slides of the presentations held throughout the process are also available, we couldn't however consider them for matters of capacity.

Compared to the treatment of the written statements as in 5.2.1. (details in Appendix 2), the amount of materials to consider for the analysis here is much larger: more than 70.000 words compared to about 9.000. Furthermore the minutes are object of analysis in Chapter 6 as well. That analysis requires the process of coding to be led at the level of the individual argument. This implies the coding of more than 4.000 individual sentences, both deductively and inductively. Due to lack of resources, a complete characterisation of the materials represented by the minutes was not possible. It is therefore necessary to report on how we proceeded.

After studying all minutes in their full extent, we extracted a random sample of sentences for quantification purposes. We initially extracted a random sample of 100 sentences ("Sample": N=100), then expanded it including two contiguous sentences up and down from those belonging to the original sample ("Sample++": N=482[36]). Reason for this expansion was to reduce the extraction of the statements from their context. Relying on contiguous sets of statements allowed us not to miss, while coding, the meaning of the line of reasoning thereby voiced.

We then proceeded to test the sample's representativeness. As we could partly characterise the minutes (e.g. by speaker, by proportion between meetings and working groups, by number of presentations), we then tested whether the sample presented the same proportions as the overall bulk of statements, as shown in Table 5.4, 5.5 and 5.6. Table 5.4 presents the total number of sentences from each meeting (E), those sampled (E_S), and their ratios against the respective totals (E/T

[36] Expanding "Sample" by adding two contiguous statements up and down would produce a "Sample++" of 500 statements only if the statements in "Sample" are more than 5 statements apart from one another. As we extracted a random sample (and not a systematic one, such as picking every 5th or 10th statement), this turned out not to be the case in "Sample++". As the strips of contiguous statements partly overlapped, we ended up with N=482.

and E_S/T_S). It then presents the difference between the ratios, meeting by meeting. Table 5.5. does the same by speaker while Table 5.6. controls for the ratio between presentations and open discussion.

The tables show that differences in those proportions between the overall bulk of statements and the sample are generally in the order of 1%. For us it basically means that no meeting, no speaker and no form of speech is over or underrepresented in the sample compared to the minutes as a whole. We then proceeded to code the sample, which was further expanded by one extra statement up and down for every strip of contiguous statements. These additional statements were coded as well but were not considered in the calculation.

Label Meeting	E	E_S	E/T	E_S/T_S	Diff.
Meeting 01	287	33	0,063	0,068	-0,005
Meeting 02	98	15	0,022	0,031	-0,009
Meeting 03	124	5	0,027	0,010	0,017
Meeting 04	65	5	0,014	0,010	0,004
WG Measures 01	114	5	0,025	0,010	0,015
WG Techn. State of the Art	188	30	0,042	0,062	-0,021
Meeting 05	223	25	0,049	0,052	-0,003
WG Measures 02	220	15	0,049	0,031	0,018
Meeting 06	93	5	0,021	0,010	0,010
Meeting 07	85	15	0,019	0,031	-0,012
WG Scenarios 01	117	10	0,026	0,021	0,005
Meeting 08	82	15	0,018	0,031	-0,013
Meeting 09	159	10	0,035	0,021	0,014
Meeting 10	140	17	0,031	0,035	-0,004
WG Measures 03	120	25	0,027	0,052	-0,025
Discussion Meeting April 15	192	5	0,042	0,010	0,032
Meeting 11	106	10	0,023	0,021	0,003
Symposium Salinity	102	10	0,023	0,021	0,002
WG Scenarios 02	211	22	0,047	0,046	0,001
Meeting 12	172	15	0,038	0,031	0,007
WG Scenarios 03	147	20	0,033	0,041	-0,009
WG Pipeline/NIS	228	15	0,050	0,031	0,019
Meeting 13	347	70	0,077	0,145	-0,068
Meeting 14	164	19	0,036	0,039	-0,003
WG Salinity Thresholds	194	26	0,043	0,054	-0,011
WG Pipeline	215	15	0,048	0,031	0,016
Meeting 15	210	10	0,046	0,021	0,026
Meeting 16	118	15	0,026	0,031	-0,005

Legend:
E: Entries
E_S: Sampled entries
T: Total entries
T_S: Sample size

Table 5.4 – Representativeness of the sample S++ in respect to the meetings.

Speaker	Direction	Borchardt	Richter	Sc. Supp.	Group
Entries	893	182	7	50	1380
Sample	87	21	0	2	168
Entries/Total	0,27	0,05	0,00	0,01	0,41
Sample/Total	0,24	0,06	0,00	0,01	0,46
Diff	0,03	0,00	0,00	0,01	-0,05

Speaker	K+S	Stahl	Waldmann	Mayer	Moehle
Entries	80	331	84	229	125
Sample	4	40	17	15	14
Entries/Total	0,02	0,10	0,02	0,07	0,04
Sample/Total	0,01	0,11	0,05	0,04	0,04
Diff	0,01	-0,01	-0,02	0,03	0,00

Legend
Sc. Supp.: Scientific Support

Table 5.5 – Representativeness of the sample S++ in respect to the speakers.

	Speech/Presentation	Discussion	Ratio
All Entries	963	3332	0,29
Sample	106	354	0,30
Diff.			-0,01

Table 5.6 – Representativeness of the sample S++ in respect to the form of speech.

The process of coding took place iteratively. After reading the whole set of statements, we coded about 2.000, so as to do the final inductive coding from a higher spot on the learning curve. We then extracted the codes and calculated their frequencies a few times so as to achieve a manageable selection of topics best characterising the discussion. The final selection is presented in Table 5.7.

Table 5.7 shows the relative frequencies of the topics object of discussion and their position on the percentile distribution[37]. While reading Table 5.7 or any of the following tables, one must keep in mind that the codes are not mutually exclusive. Each individual statement is assigned one or more codes on the basis of the combination of topics it addresses. We hence must achieve a characterisation of the discussion at hand by looking at the combination of topics and their relative frequencies against the whole sample or specific sub-samples rather than against

[37] For the meaning of relative frequency and percentile distribution, please refer to footnote 30 and 31 above.

one another. We do this in detail in Appendix 3. Here, we proceed instead with a few paradigmatic quotes and with a reflection on the insights thus derived.

Topic/Code	**f**	**Freq. Thresholds**
Measures (*"Maßnahmen"*)	0,26	Max
Procedures (*"Prozedur"*)	0,26	
Available information (*"Vorhandene Information"*)	0,17	
Legal (*"Rechtliches"*)	0,13	>90th Percentile (0,13)
Time (*"Zeit"*)	0,11	
Solutions (*"Lösungsansätze"*)	0,09	
Effect (*"Auswirkungen"*)	0,09	
State of disturbance (*"Belastungssituation")*	0,06	
Economicity (*"Wirtschaftlichkeit"*)	0,06	>75th Percentile (0,6)
Need for clarification (*"Klärungsbedarf"*)	0,06	
Local conditions (*"Standortbedingungen"*)	0,06	
Expertise (*"Expertise"*)	0,06	
Disposal practice (*"Entsorgungspraxis"*)	0,05	
Watershed quality (*"Gewässerqualität"*)	0,04	
Injection practice (*"Versenkung"*)	0,04	
K+S (*"K+S"*)	0,04	
Consent/Consensus (*"Konsens"*)	0,04	
Production (*"Produktion"*)	0,04	
Public/Communication (*"Öffentlichkeit"*)	0,03	
Feasibility (*"Machbarkeit"*)	0,02	
Politics (*"Politik"*)	0,02	
Jobs (*"Arbeitsplätze"*)	0,02	
Forecast model (*"Prognosemodell"*)	0,01	
EuWFD (*"WRRL"*)	0,01	
Transparency (*"Transparenz"*)	0,01	
Roßleben (*"Roßleben"*)	0,01	
Objectivity (*"Sachlichkeit"*)	0,01	
Trust (*"Vertrauen"*)	0,01	
Effectiveness (*"Wirksamkeit"*)	0,01	
Visit (*"Besuch"*)	0,01	
Heaps (*"Halden"*)	0,01	
Communication (*"Kommunikation"*)	0,00	
Public-Law Contract (*"OeR Vertrag"*)	0,00	
N:	482	

Table 5.7 – Relative frequencies (f) of the topics mentioned in the minutes.

5.2.2.2. Paradigmatic quotes

"(Prof. Dr. Stahl) explains the technical specificities of the process of cooling salt-rich wastewaters, as well as the potential for a reduction of the environmental pressure. The latter is expressed as the minimal volumetric reduction as well as the reduction of the salt load of up to 20% of the total magnesium content of the wastewaters. Prof. Dr. Brinckmann asks about the economic perspectives of a possible change of the production process. The answer of Prof. Dr. Stahl is that it depends on the current product prices". (Meeting 06, pg. 5)[38].

"An important reason for the stipulation of the agreement to this specific point in time is that this is necessary to rapidly obtain information from K+S concerning a production without injection so as to define an interim permit: from which time on is such an arrangement feasible, through what measures and with what effects? On this matter, the agreement defines a procedure with clear deadlines. This may sound too little for some. Due to legal and practical matters, though, it is currently not possible to regulate more things than these with an agreement" (Minutes Meeting 9, pg.2)[39].

"Concerning the parameters for the quality objectives proposed by the RT (90-Percentile), it is shown that these thresholds are not suitable, because peaks in the environmental pressure can counterfeit the recovery of the ecosystem. It becomes however clear in this debate that the RT formulates target conditions rather than

[38] Original text: *"Hinsichtlich der Nachkühlung von Salzabwässern erläutert (Prof. Dr. Stahl) die technischen Zusammenhänge sowie die Potenziale zur Reduzierung der Belastung, ausgedrückt als minimale Volumenreduktion sowie als Reduktion der Fracht um bis zu 20 % der gesamten Magnesium-Menge der Salzwässer. Prof. Dr. Brinckmann fragt nach den ökonomischen Perspektiven der Verfahrensumstellung. Die Antwort von Prof. Dr. Stahl ist, dass dies von den aktuellen Produktpreisen abhängt".*

[39] Original text: *"Ein wichtiger Grund für den Vertragsabschluss zum jetzigen Zeitpunkt bestehe in der Notwendigkeit, für die Ausgestaltung einer Übergangserlaubnis von K+S sehr schnell Informationen zu einer Produktion ohne Versenkung zu erhalten: Ab wann ist eine solche Produktion möglich, mit welchen Maßnahmen und mit welchen Auswirkungen? Hierzu regele die Vereinbarung ein Procedere mit klaren Terminsetzungen. Dies möge manchem wenig erscheinen, aber aus rechtlichen und tatsächlichen Gründen seien zum gegenwärtigen Zeitpunkt in einer Vereinbarung mehr Dinge nicht zu regeln".*

thresholds. The RT lays down guidance values. The question is under which overall conditions these values can be met" (Minutes Meeting 14, pg.6)[40].

5.2.2.3. Overview of the observations

The overall discussion emerging from the minutes seems to be a very focused and structured one, at least as we can read from the incidence of procedural issues and references to individual measures. This insight will be confirmed in the next chapter, where a coding based on the analytical framework will reveal a very technical approach to solving the Werra problem at the RT. Nearly two years of meetings at the RT can be best understood as a collective effort to systematically review technical possibilities so as to allow for further production with no harm to the Werra/Weser river basin.

Beside these two pillars, legal and administrative matters, questions of knowledge and evidence and specific geographical and temporal circumstances alternatively gained ground throughout the different phases of the discussion. The contributions to these thematic swings can be referred rather precisely to the production of arguments by specific individual or group actors, mirroring the events that characterise the overall narrative. In the following section, we focus on the point of view of these very actors as they emerged from the interviews we have conducted with selected RT Members. For the details of the analysis that led us to these interpretations, please refer to Appendix 3.

[40] Original text: *"Bezüglich des Parameters für die vom Runden Tisch vorgeschlagenen Qualitätsziele (90-Perzentil) wird vorgetragen, dass dieser für Grenzwerte nicht geeignet sei, da hohe Belastungsspitzen die Erholung der Ökosysteme zunichte machen können. In der Debatte wird klar, dass (...) der Runde Tisch keine Grenzwerte, sondern Zielzustände formuliere. Der Runde Tisch lege für die Salzbelastung Orientierungswerte vor und die Frage sei, über welche Rahmenbedingungen diese eingehalten werden könnten".*

5.2.3. Interviews: 1st Round

5.2.3.1. Characteristics of the materials

The RT Members were interviewed for the first time in July/August 2009. While approaching them, priority was given to the continuity of presence at the RT: for each main group, we prioritised those Members that took part to the most Meetings and Working Groups. This allowed us to produce a set of 16 interviews ranging between 14 and 67 minutes. The structure of the interviews had a rationale in the theoretical discussion as of in Chapter 3[41]. The interviewees tended however to respond from within their own narratives and thus provide a much richer and broader picture than what they were actually asked.

In the following, we intend to characterise the overall picture emerging from their responses rather than the one we were actually searching for while making the questions. This is consistent with the distinction between inductive and deductive approach to the materials (see: beginning of section 5.2. above). We deal here with the inductive approach and concentrate on the overall narrative emerging from the interview materials beyond the specific contents aimed at with the interviews. Chapter 6 will instead work out the materials deductively and produce an analysis of the interviews consistent with the analytical framework in Chapter 4.

For the first round of interviews, it will be enough for the reader to keep in mind that the interviewees were asked about three things: their nomination as Members of the RT, the way they saw the problem at the beginning of the discussions and the way they saw it at the time of the interview. The latter two points were split between the individual assessment and the likely assessment from the point of view of other Members. Initially, this had the goal of helping the interviewee articulate his/her own position by “practicing” while articulating someone else’s point of view. In the end, it proved to be a rich source of data on how the RT Members saw and approached one another in the course of the discussions.

The interviews were subsequently coded the same way we coded the initial statements. For this purpose, we could have adopted the same list of topics derived from the initial statements (Table 5.3) or from the analysis of the minutes (Table 5.7).

[41] See Appendix 5, Sections A5.1. and A5.2. for the corresponding interview guidelines, respectively in German and English translation.

Our objective was however to let a narrative emerge from the materials. By adopting codes from other materials (or from theoretical inquiries) we would have rather forced a specific perspective onto them. The codes were therefore derived anew from the interviews by the means of an iterative process. The results are shown in Table 5.8 below. For both this and all the following tables, please refer to footnotes 30 and 31 for the meaning of Frequency (f) and Frequency Thresholds.

The top of the list is clearly influenced by the interview guidelines: all interviewees were explicitly asked about their background and prior experiences, about the criteria a desirable solution has to fulfil and about what is important for them (thus: their specific motivation). Therefore, it is more interesting to look at what happens between the 75th and the 90th percentile: there we have topics which were covered by a significant portion of the interviews but that depend more closely on the way arguments were articulated and less on the way the interview was structured. The interview guidelines do not mention any of these topics: instead, interviewees brought them up while making their point of view clear.

Ideally, the following analysis would be dedicated to both sets, as they both appear important, albeit for different reasons. Matters of space do not allow us a similar depth of analysis, though. We will therefore concentrate on the top entries as they will add flesh to the bones of the otherwise rather dry formal analysis in the following Chapter 6. Subsequently, for the sake of completeness, we will sketch a few tenets from the remaining topics above the 75th percentile.

Before we proceed it is important to mention that matters of confidentiality bind us to guarantee a certain degree of anonymity to the individual respondents. Quotes will therefore be reported in connection to the major groupings at the RT (Administration; Industry; Environment; Riparian – see brief description in Chapter 2, 2.2.6), both here and in Appendix 4, where we analyse them in depth.

Code	f	Freq. Thresholds
Criteria	1,00 (16)	Max
Motivation (specific)	1,00 (16)	Max
Background and prior experiences	0,94 (15)	
K+S	0,88 (14)	
Information and knowledge	0,88 (14)	>90-Percentile (0,88)
Legal/administrative	0,81 (13)	
Solutions and measures	0,81 (13)	
Contribution of the RT	0,75 (12)	
Chances for the RT	0,69 (11)	
Motivation (generalised)	0,69 (11)	
Pipeline	0,69 (11)	
Politics	0,69 (11)	
Relationship	0,69 (11)	>75-Percentile (0,69)
Groundwater	0,63 (10)	
Trade-off	0,63 (10)	
Consensus	0,56 (9)	
Jobs	0,50 (8)	
Economicity	0,50 (8)	
EuWFD	0,50 (8)	
Public/Communication	0,50 (8)	
Quality of the discussion	0,50 (8)	
Watershed quality	0,50 (8)	
Measures Package	0,38 (6)	
Production	0,31 (5)	
Stake	0,31 (5)	
Technology	0,31 (5)	
Salt heaps	0,25 (4)	
Effects	0,19 (3)	
Authority	0,19 (3)	
Role of Science	0,19 (3)	
Sustainability	0,19 (3)	
Werra/Weser	0,19 (3)	
Feasibility	0,13 (2)	
German reunification	0,13 (2)	
Participant's capacities	0,13 (2)	
N:	16	

Table 5.8 – Relative frequencies (f) of the topics mentioned in the interviews (1st Round).

Absolute frequencies in parentheses.

5.2.3.2. Paradigmatic quotes

"I entered the RT (…) with the goal of doing as much as possible with local solutions, everything which is feasible, and then (introduce) the perspective of a pipeline" (Administration)[42].

"For me, it was important that the problem is solved technically, and not shifted to another area" (Administration)[43].

"Sure I tried to shift the focus of the discussion to the socio-economic necessity of the environmental pressure. This means: if the factory wants to produce, it has to produce economically. They can surely assess whether it is possible to dispose of the waste in the North Sea within an economic production. If this is still profitable, then we have a possibility for disposal. If this is not profitable anymore, we have to live with the consequence that there will be no production anymore" (Riparian)[44].

"If the RT recommends a certain solution, it gains weight. And if the public opinion says it is a good solution, I believe this is something one can have political support for" (Environment)[45].

[42] Original text: *"Ich bin ja rangegangen (...) mit dem Ziel, vor Ort so weit wie möglich etwas zu tun, alles was möglich ist, um dann die Perspektive der Leitung (einzuleiten)"*.
[43] Original text: *"Für mich war wichtig, dass das Problem technisch gelöst wird, und nicht durch eine Umlagerung in ein anderes Gebiet"*.
[44] Original text: *"Natürlich habe ich versucht in der Diskussion (...) den Schwerpunkt auf [17:47] die volkswirtschaftliche (...) Notwendigkeit der Umweltbelastung zu legen. Das heißt, wenn das Werk produzieren will, muss es wirtschaftlich produzieren. Dass im Rahmen der wirtschaftlichen Produktion notwendig ist, diese Entsorgung in die Nordsee zu schultern, dann wird ja sicherlich gerechnet werden und dann gibt es Entsorgungsmöglichkeiten. Für das lässt sich rechnen und das ganze ist wirtschaftlich darzustellen oder lässt sich nicht rechnen und dann muss man eben mit der Konsequenz leben, dass es keine Kaliproduktion mehr geben wird"*.
[45] Original text: *"Da denke ich schon, dass, wenn der RT eine Lösung vorschlägt, diese dann Gewicht haben wird. Und wenn die öffentliche Meinung sagt, ja das wäre doch eine gute Lösung, dass es etwas ist, was man politisch gehen kann"*.

5.2.3.3. Overview of the observations

The first round of interviews took place between July and August 2009 and involved 16 RT members of the four main interest groups (Environment, Industry, Administration and Riparian). Interviewees had the chance to express their views on the criteria a desirable arrangement should fulfil. They could also articulate what is important for both themselves and for one another. The interview materials reflect that and provide us with clues on a further range of collateral topics.

Type	Criteria: A desirable solution has to:
Environmental	durably reduce the salinity of the Werra and of the Weser; allow for a removal of the heaps; address all other environmental impacts of the salt production, starting from the groundwater; avoid a displacement of the environmental pressure towards other locations or other environmental media; decrease the ratio between extracted and wasted salt; prove environmentally beneficial even if considering the short and long-term side effects of the individual measures as well;
Economic	be within the financial possibilities of K+S; do not impair the competitiveness of K+S; allow for long-term planning by K+S; exploit future technical progress; stimulate future technical progress through investments by K+S; guarantee an economic production for K+S;
Legal/administrative	comply to existing legislation; minimise the interference with political processes; gather political support;
Social	maintain employment;
Procedural	be coordinated among all involved parties; be achieved without time delays; address all possible and proposed technical measures; be supported by and verified through scientific assessments; be based on scientific assessments of ecological and economic aspects; be transparent towards economic (also company-internal) dimensions; be complemented by life-cycle assessments of all individual measures considered; be "realistic".

Table 5.9 – Criteria emerging from the first round of interviews.

In order to constitute a “solution” for the salinity problem, a desirable arrangement must fulfil specific environmental, economic, legal/administrative, social and procedural criteria. These criteria are enlisted in Table 5.9.

According to the interviews, the different groups could learn about one another at the RT. At aggregated level, they learned that environmental groups do acknowledge jobs as a legitimate goal. They also learned that the administration is rather weakly divided between upstream and downstream states (exception made for Niedersachsen) and, for the upstream states, not strictly in line with the position of K+S. Finally, they learned that industry groups acknowledge environmental goals as well and that, within limits, they can see an enhanced environmental protection as functional to employment and not as a threat to it.

The interviews also provide us with information on collateral topics such as K+S, the contribution and chances of the RT, the role of and challenges for a representative at a RT, the role of politics in the RT process and the relationship between representatives. K+S can change its attitude and its way of communicating to the outside, it can’t however change its way of doing things and/or its objectives. Along the process, K+S has opened up to the dialogue at the RT (at least for the time until the interviews took place) and learned to communicate with civil society and the public.

The chances and contribution of the RT are portrayed in the light of the difficult challenge the process has to face: reportedly, there is little to be done for a significant environmental improvement and interests are found fundamentally diverging. The RT’s contribution to the solution of the salinity issue at the Werra and Weser consists in allowing for an “objective”, unbiased discussion, gathering neutral expertise in a transparent fashion. This does not change either the general interests or the specific position of any of the actors involved, it is however seen both as a factor of success in identifying a solution and as a value in itself. Most important, actors know more about one another because of the process at the RT.

This is confirmed by the sections on generalised motivation and relationship. Representatives cannot really change their positions as they are bound to specific mandates and expectations. Possibilities for them to “move” towards consensual solutions lie in the grey areas of such mandates. The size of such grey areas vary

across the RT members and is reportedly tightest for Niedersachsen and K+S. Other actors e.g. from the Industry group report being entrusted with rather far-reaching mandates.

While dealing with tight mandates, politics is perceived as an additional challenge. It is seen as fundamentally external to the RT and subject to rather unpredictable drivers. From the point of view of the Members of the RT, politics constitutes a framework condition for the achievement of a solution, which can hardly be affected and/or engaged in a substantial dialogue. As found in the subsection on 'relationship' (Appendix 4, Subsection A4.1.3.6.), the increased mutual understanding achieved (so far) through the RT allows however for a more precise assessment of the external limitations each group has in moving towards a consensual solution, including limitations coming from the political arena. For the details of the analysis that led us to this interpretation, please refer to Appendix 4.

5.2.4. Interviews: 2nd Round

5.2.4.1. Characteristics of the materials

The RT members were approached a second time between November and December 2009. Aim of the second round of interviews was to produce data over a time series, the second round being meant as an assessment after the issuing of the RT recommendation. The events at the RT changed however the baseline conditions for the assessment and required a few changes in the general structure of the interview. We specifically refer to: 1) the first postponement of the final recommendation from August to November 2009; 2) the change of the K+S representative at the RT; 3) the "preliminary vote" on November 2009 and the second postponement to February 2010.

At the time we drafted the research design for this work, the RT intended to produce a recommendation and vote it during a two day retreat in late August 2010. Minutes were not planned for that meeting, implying that the only source of information would have been the anonymous vote and the recommendation itself. This circumstance led us already early in the process to structure the interview in such a way that would

allow us to reconstruct the core dynamics of the discussion and the terms of the decision at stake.

The above has however stressed many times the crucial role of expert assessments in guiding the discussion at the RT. A few central assessments, could not be completed early enough for consideration during the retreat. For example, the findings of the assessment of the environmental costs and economic role of K+S in the region were presented at the retreat itself. This led the RT to postpone the decision on a draft recommendation to November 2009.

In the meantime, the representative of K+S Prof. Ingo Stahl fell seriously ill and had to leave the process. Prof. Stahl, who up to that moment hadn't miss a single meeting, could thus not attend the August retreat. His place was taken by the official back-up representative Dr. Waldmann, who attended many of the previous meetings as part of the audience. Prof. Stahl died on December 24, 2009, as we later read in the minutes of Meeting 16[46].

The change of representative constitutes a turning point in the attitude of K+S towards the RT. As already presented above[47], we enter here a third phase of the process, where in the eyes of K+S, the perspective of a pipeline loses ground in favour of the "NIS". This change of perspective by the major actor K+S created problems to the overall process. The product of this is a controversial vote in the November meeting, scoring 15 votes in favour, 6 abstentions and 3 contrary votes.

At the time we planned and conducted the interviews, we had no access yet to the minutes of the meetings referred to here, neither did we know whether these minutes were going to be available any time soon. We therefore had to reconstruct the process through targeted questions. Our initial plan was, instead, one of simply repeating the questions from the previous interview guidelines, focusing on what is presently important for the interviewee.

[46] Meeting 16 took place on February 9, 2010. The minutes were published in March 2010, and that is when we heard of the news. An interview with Prof. Stahl was initially planned for July. It had first to be postponed and then cancelled. The first postponement of the interview already forced us to re-think the strategy on how to approach K+S and gather the corresponding interview materials. The further withdrawal and later death of Dr. Stahl led us to abandon the goal of interviewing a representative of K+S within the frame developed for this work.

[47] See subsection: 4.1.3.4. "Events during the process".

Subsequently, we produced interview guidelines that first capture the terms of the decision at hand and then elicit criteria by asking the respondent to stress what is desirable and what is not desirable about the options at hand. The guidelines had also the intention to capture the expected consequences of the change of representative for K+S and to extract a narrative on the meaning and consequences of the voting of the November meeting[48].

Eventually, and against our expectations, we did get access to the minutes of all meetings referred to here, including the final one in early February[49]. The information made available this way made much of the interview materials redundant[50]. In the following, we will therefore leave those aspects and topics aside, that aim at characterising the process's latest phase and concentrate instead on substantial issues.

5.2.4.2. Paradigmatic quotes

> "Basically everybody wishes to take the salt load under control without the pipeline and without the dislocation to the North Sea. All assessments have shown (…) that it's not possible (…). That's why the last chance is this pipeline. We presently have no real alternative" (Administration)[51].

> "In August/September, a rather large majority at the RT was of the idea that the pipeline is the solution, and now the NIS by K+S comes into the game as an

[48] The interview guidelines are available in Appendix 5, Sections 5.3. (original German text) and 5.4. (English translation).
[49] Specifically, we could make use of the minutes of Meeting 14 (the August retreat) and Meeting 15 (November 2009), plus three more working groups that took place in the meantime. As anticipated above, the minutes of Meeting 16 came however too late for consideration in the analysis done in this and in the next chapter.
[50] Appendix 5, Sections A5.3. and A5.4., report the interview guidelines for this second round of interviews.
[51] Original text: *"Im Grunde genommen wünschen alle, dass man die Belastung ohne eine solche Fernleitung und Verlagerung in die Nordsee hinkriegen könnte. Alle Untersuchungen die der RT veranstaltet hat, haben gezeigt, dass es (...) nicht geht (...). Deswegen ist die Ultima Ratio diese Fernleitung und wir haben bis heute keine einzige, wirkliche Alternative dazu"*.

alternative. I believe it has other causes, probably a purely economic one… how the company pulls the money together for the pipeline" (Industry)[52].

"Sometimes, I take the arguments against the pipeline for quite philosophical. (…) Niedersachsen questions the sensibility of the pipeline and has announced its opposition. I do not quite understand that" (Industry)[53].

5.2.4.3. Overview of the observations

The RT members were approached a second time between November and December 2009. Members from the four main groups (Administration, Environment, Industry and Riparian) that were already interviewed in the summer 2009 were approached again and could express their view on the present state of the discussions at the RT.

The resulting interview materials focus on the way RT Members see the decision ahead and its main components. They could express what is desirable and what is not desirable about the options on the table and they could provide their perspective on the latest events in the RT process. We could thus derive clues on the characterisation of the measures under consideration and the necessary terms and conditions for a recommendation. We also could see that no substantial development took place concerning the criteria identifying a desirable solution.

Concerning the specific interventions at hand, the discussions at the RT revolve around the characterisation and the mutual relationship of NIS and pipeline solution. The NIS is a newcomer in the process, reportedly consisting in a different type on injection practice. Coupled with the already settled Measures Package, it allows for a further reduction of the salt load in Werra and Weser. However, it implies a continued

[52] Original text: *"Der RT war ja mal im August/September (…) ziemlich mit großer Mehrheit der Meinung, die Pipeline wäre ja die Lösung, die empfohlen wird, und jetzt ist die NIS von K+S mit ins Boot gekommen, und wurde als Alternative genannt. Ich denke, das hat andere Ursachen, wahrscheinlich eine rein wirtschaftliche (Erklärung)... wie das Unternehmen wirklich die Mittel aufbringen kann, eine Leitung zu bauen".*

[53] Original text: *"Also ich halte die Widerstände, die manchmal dagegen gehalten werden, für philosophisch. (…) Niedersachsen diskutiert über die Frage der Sinnhaftigkeit der Laugenpipeline und hat dort Widerstand angekündigt, was ich nicht nachvollziehen kann".*

use of both the underground and the river basin for salt disposal and thus precludes any possibility for a salt free Werra in the future.

The pipeline solution, in turn, is seen mostly in the light of its delayed effectiveness, raising the question of an interim solution. The debate revolves thus on the likely role of the NIS in these respects. More specifically, the solution envisioned by the majority of the RT Members includes a degree of local abatement: possibilities for local disposal and, even more important, for an improvement of the production/waste ratio shall be exhausted even in the light of a pipeline. The exhaustion of these possibilities (mostly through the Measures Package) seems not to be conducive of a complete relief of the watershed from the salt load related to current production, raising in turn the question, whether the Package can be considered enough for an ad interim solution or whether additional temporary measures (e.g.: NIS) are necessary until the pipeline is realised. Interviewees do not seem to have a homogenous opinion on this matter.

Finally, the interview materials provide us with insights on the role and perception of the position held by the state of Niedersachsen in the process. The opposition made by Niedersachsen to the pipeline puzzles the interviewees, as the reader can see in Appendix 4, Section 4.2.2. through the eyes of the RT Members themselves. For them, it is clear that Niedersachsen has a stake, it is however not clear what that stake is. We can briefly summarise here that the arguments brought up are not convincing. Even less convincing is the attitude of holding on to these arguments despite their dismissal on a technical and/or scientific basis and/or of making up new ones. While in the previous round, a certain understanding for the situation of the respective representative was brought up, here interviewees repeatedly stress the irrationality and arbitrariness of the situation. Appendix 4, Section A4.2., reports the details of the analysis that led us to this interpretation.

5.3. Summary

This chapter has provided a detailed description of the Werra case and of the related materials. We have started by exploring the way current regulations shape the choice

between extraction and environmental protection, in line with the research question of this work. We have seen that there may be problems in terms of compatibility with the European Water Framework Directive and have turned to the discussion at the Round Table so as to investigate how participants get a hold on the issue and identify a way forward.

With the recommendation of February 2010, the RT endorses with a broad majority (22/25) a production optimisation scheme consisting of a broad range of local abatement measures. It further recommends the construction of a pipeline to the North Sea and accepts the continuation of the current disposal into the underground and on the salt heaps as temporary measures during the construction time of the pipeline. Finally, it recommends to further explore alternative disposal channels and additional optimisation options.

The RT process may represent a political success, due to the broad majority supporting its recommendation. At a closer look, we could however see that it has failed from a substantial point of view: the process has not proven successful in identifying a viable alternative arrangement, capable of being implemented or even likely to be implemented. This is due to the rejection by K+S and by the state Niedersachsen, two key actors in the implementation of the proposed measures. What is more, neither K+S nor Niedersachsen could convincingly articulate their position, raising questions on the mutual learning process that has taken place during two years of discussions.

Our perspective on the process's outcome relies on a strong interpretation of the wordings contained in the output documents and in the interviews. This means: we can say what we say here if we take them by word in speech and writing. In search for weaker formulations, softening the meaning of statements and thus allowing for different outcomes, we have turned to the interview and written materials we have collected all along the RT process. We have therefore analysed a set of ex-ante written statements, the minutes of the RT meetings and the transcripts of two rounds of interviews.

From the written statements produced at the beginning of the process, we have seen a tendency to structure the salinity issue in the Werra/Weser watershed with reference to the European Water Framework Directive, the allowed salinity

thresholds, the overall watershed quality and a balance between economy and ecology (together with the employment issue), the last point returning the most counter-intuitive insights. A closer look at the trade-off between ecology and economy, reveal that the real trade-off is between ecology and employment, and that the latter is a direct function of the competitiveness of K+S.

Furthermore, we can detect inconsistencies in the formulations provided by the statements, in particular concerning the use of terms such as “balance”. Specifically, there are statements that advocate for an equal consideration between the environment and the economy in some passages. The same statements give then explicit priority to economic issues over environmental ones a few paragraphs later. Similar statements seem internally inconsistent to us (see 5.2.1.3. and refer to Appendix 2 for a detailed analysis of the statements).

Through the analysis of the minutes, we could distinguish phases in the debate, where legal and administrative matters, questions of knowledge and evidence and specific geographical and temporal circumstances alternatively gained ground. These topics are however always second to procedural matters and individual measures, constituting the real drivers of the discussion at the RT. Interestingly, these thematic swings can be followed rather precisely in the production of arguments over time by specific individual or group actors, mirroring the events that characterise the overall narrative (see 5.2.2.3. and refer to Appendix 3 for a detailed analysis of the minutes).

Through the interviews we learned that, in order to constitute a “solution” for the salinity problem, a desirable arrangement must fulfil a broad set of environmental, economic, legal/administrative, social and procedural criteria as enlisted in Table 5.9. As it can be seen in Appendix 4, these criteria proved static throughout the process, so that moving towards consensual solutions must hinge on other dimensions. At the RT, for example, participants learned mostly about one another. This is important in a situation where the possibilities for representatives to “move” towards consensual solutions lie in the grey areas of their mandates, whose size varies from Member to Member (see 5.2.3.3. and refer to Appendix 4 for a detailed analysis of the interviews).

In spite of the mutual understanding developed throughout the process, puzzles do not fail to emerge by the end of the discussion. The success of the RT process was

compromised by the position of key actors K+S and Niedersachsen, whose real motives are not clear to the other Members of the RT and do not seem to be affected by the scientific and technical findings that the process has produced. A perception of arbitrariness and irrationality is thus widespread among the interviewees, who however acknowledge being bound to politics and to their own mandates beyond any objectivity that the process may offer (see 4.2.4.3. and refer to Appendix 4 for a detailed analysis of the interviews).

Chapter 6 – Analysis

Sections: 6.1. General Hypothesis and Framework Operationalisation; 6.2. Dependent Variable: Statements and Interviews; 6.3. Independent Variable: Minutes; 6.4. Discussion: Linking the Dependent and the Independent Variable; 6.5. Conclusions.

The overarching objective of this work is to explore the nexus between socio-ecological arrangements and the deliberative process of distributing entitlements and obligations among actors within a socio-ecological system. Chapter 3 has explored the Economics literature on institutions and environmental distribution conflicts, allowing Chapter 4 to produce a framework for the analysis of empirical materials. Chapter 5 has then established a link with an actual process, providing a detailed description of the Werra/Weser Round Table (RT). With specific reference to the materials collected about the RT process, Chapter 6 intends now to link the decision output thereby produced to the discussions that have characterised the process. It does so by focusing on the criteria making up the participants' positions on the decision output, which are seen in the light of the arguments raised throughout two years of discussions at the RT.

Chapter 6 follows the development of these criteria over time and compares the observed changes with the arguments emerging from the minutes. Both are characterised with reference to the analytical framework developed in Chapter 3. Consistently, Chapter 3's analytical framework shapes both the interview guidelines and the coding of the minutes. Furthermore, a General Hypothesis appears at the end of that same chapter. In the following, we tailor it to the specifics of the RT process and test it against the available empirical materials. By this, we want to achieve a deeper understanding of the contribution of the RT process to the environmental problem it has dealt with. We will then be able to extend the insights thus obtained from the single case to general cases meeting similar conditions. In particular, we aim at producing insights concerning process design and the practice of participation in environmental decision-making.

6.1. General Hypothesis and Framework Operationalisation

The Research Question shaping this work has been previously formulated at varying degrees of specificity. At the highest level, under the label of RQ4, the Research Question targets the “means and processes [through which] actors communicate so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference”. The literature review has then sharpened the focus of our inquiry by focusing on the effects such means and processes do or do not produce on the actors designing socio-ecological arrangements. The analytical framework produced in Chapter 3 narrows the analysis to two fundamental dimensions: the heuristic adopted by the individual participants (“rationality”, R) and the knowledge they thereby apply so as to link possible actions to likely, expected outcomes (“mental model”, M). Both are seen as 1) individual preconditions for collective, shared arrangements and 2) as a product of the arguments raised throughout the process.

Given the above, we could formulate the following General Hypothesis:

$$[H0]\ \partial R/\partial P \neq 0 \text{ so that } \Delta A^* = f\ (R \mid P),$$

meaning that we intend to test whether we can explain the change of arrangement ΔA^* as a function of the change in rationalities produced by the process via the arguments thereby raised (R conditioned to P). Of course, the same is valid for M as well. Specifically, $\partial M/\partial P$ represents the contribution of the process to the knowledge available to the participants. It is commonsensical and understood that the participants acquire new knowledge through the process. That is in principle not disputed and thus not worth testing. Furthermore, it has been adequately dealt with in Chapter 5, so that we can now concentrate on $\partial R/\partial P$ taking $\partial M/\partial P$ for granted.

Chapter 5 has adopted an inductive approach. Complementarily, Chapter 6 now proceeds with a deductive set-up, as implicit in the idea of testing the hypothesis above. The hypothesis formulated so far needs however further specification before it can be tested against empirics. We can see the above formulation as

$$\partial R/\partial P = (\partial R/\partial t) / (\partial P/\partial t),$$

thus comprising two analytically distinct elements, which we can treat separately. The first one, $\partial R/\partial t$, focuses on the question whether changes in R can be detected at all: the question targets specifically whether the heuristics participants apply at the beginning and at the end of the process differ in their formulations. The second element, $\partial P/\partial t$ deals instead with the developments of the process, understood in terms of the discussions unfolding therein over time.

The two different elements $\partial R/\partial t$ and $\partial P/\partial t$ refer to different materials and have thus to be operationalised accordingly. In the first case, targeted, semi-structured interviews have been carried out and integrated with written materials. In the light of the theoretical discussion from Chapter 3, interview guidelines have been drafted that focus on the way interviewees look at possible solutions. Aim was to elicit what is important for them in a desirable arrangement "solving" the salinity problem at the Werra/Weser watershed. Within the same interview, multiple, different formulations of the same question were adopted, stressing "what is important", what criteria need to be considered, how they see the different options discussed at the RT, and whatever else came up along this line[54].

The same point was repeated over time ("now" vs. "at the beginning of the RT") and from different point of views ("for you" vs. "for other colleagues at the RT"). Additionally, at the time we carried out the second round of interviews, the discussions at the RT revolved around basically two options, so that we could ask interviewees to state the respective pros and cons. We could then move on to

[54] The interview guidelines are available in Appendix 5. All materials have been explored individually in Chapter 5. Detailed analyses of these materials are available in Appendix 2, 3 and 4.

formulating explicit criteria from there and test for changes over time so as to support or reject the presence of a ∂R/∂t.

Similarly, we have characterised the minutes of the RT meetings so as to extract criteria from the discussions. Specifically, the minutes were coded statement by statement, assessing whether they provide information about "what is", about "what affects what", about "what to consider" and about "what one prefers". We considered statements presenting elements of the first two kinds ("what is" and "what affects what") as targeting the mental models held by the "listeners" exposed to the argument, thus contributing to a ∂M/∂P and leading us to expect a ∂M/∂t, a change of mental models over time.

Statements carrying elements of the latter two kinds ("what to consider" and "what one prefers") constitute instead R-laden arguments, possibly producing R-effects and M-effects in the listeners as explained in Chapter 4. To the extent M-effects take place, R-laden statements contribute to ∂M/∂P and lead us to expect a ∂M/∂t, a change in mental models over time (specifically, those elements of mental models that reflect the heuristic one expects others to apply). To the extent, instead, R-effects take place, these statements contribute to ∂R/∂P, leading us to expect ∂R/∂t: changes in heuristics over time.

With the latter specification, our hypothesis becomes operational: provided that a change in heuristics is observed over time (∂P/∂t), and given that we expect heuristics to change as an effect of the arguments participants have been exposed to over time (∂P/∂t), does the characterisation of the arguments raised within the RT make the observed change in heuristics a matter of course? In order to test this hypothesis, we will first turn to the heuristics adopted by the RT member and verify whether a change is observed. By doing so, we will characterise our dependent variable R. Subsequently, we will characterise our independent variable P via the coding of the minutes. This way, we will be able to support or reject the correspondence between ∂R/∂t and ∂P/∂t that our theoretical inquiry seems to suggest.

6.2. Dependent Variable: Statements and Interviews

The present section presents the deductive coding of the interview materials and of the initial statements. With deductive coding we mean coding based on deduction: a characterisation of available observations shaped by a prior theoretical construction. This implies that, with the following, we intend to present a bundle of materials through the lenses of the theoretical inquiry carried out in Chapter 3. These lenses are the analytical framework we produced in Chapter 4. This stands in opposition to what performed in Chapter 5, where we presented the very same materials through lenses that "emerged" from the materials themselves, as documented at length in Appendix 2 to 4. This is implicit in any inductive effort.

Adopting the lenses of Chapter 3/4, we aimed at gathering specific insights concerning the heuristics applied by RT Members before and after the process. These criteria represent the way RT Members individually go about the task of identifying their own arrangement of preference among the options the RT is confronted with. We then compare the criteria thus extracted across individual participants and/or over time.

Common sense and the specific pieces of knowledge produced throughout the RT process can shed light on both their consistency and their mutual compatibility. We can thus achieve insights on the resulting size of the range of options for the RT. Finally, knowing what is important for given RT Members and knowing how different options perform on that side, we gain insights on the trade-offs RT Members are facing from their own perspective and thus learn what typologies of costs shape their considerations in the choice of socio-ecological arrangements.

In the following, we present the heuristics adopted by the four different core groups making up the inclusion dimension of the RT process design. We will thus deal with what is important for the Administration group, for the Environment group, for the Industry group and for the Riparian group. In principle, our materials would allow us to lead the analysis at individual level and examine the position of the individual RT members interviewed. This would be the most consistent approach given the theoretical inquiry we led in Chapter 3. In the following, we will however conduct our analysis at group level. We chose to do so for a series of reasons.

First of all, it is safe to assume a certain homogeneity of positions within groups: the interviews report statements in this sense and groups were normally the term of reference used by the interviewees while describing what is apparently important to other members. Groups appear therefore homogeneous not only to us but to the RT Members themselves. What is more, special cases (Niedersachsen, K+S) were addressed individually against this background[55] by the interviewees themselves.

Second, aggregating the criteria per groups will certainly cost us a certain amount of precision but it will allow us to make the exposition and the further treatment of the criteria manageable, transparent and robust. An analysis at individual level would require us to treat and detail out 18 different individual positions derived with varying amounts of materials (for example, some interviews are longer than others, some interviewees were not reachable for the 2nd Round, some didn't submit an initial statement). By leading the analysis at group level, we can limit the exposition to 4 main positions obtained with abundant and to an extent redundant materials, increasing robustness.

Furthermore, dealing with a smaller number of positions allows us a more detailed and less synthetic exposition as well as an easier link to the rich case description, thus increasing transparency. On the other hand, if the assumption of homogeneous positions applies at group level, we can safely consider the losses in precision as negligible. Some degree of compensation cannot be excluded (having e.g. an individual mentioning certain criteria only ex ante and another one only ex post, the aggregation yielding the criteria as constant). We can however assume that, for such cases, interviewees would have come to the same criteria had they had more time for the interview, the aggregation of multiple interviews compensating for the need for an in-depth conversation on the issue.

Finally, matters of confidentiality do not allow us to reveal what views individual respondents held within the interviews. Given the small number of participants, presenting individual positions in anonymous form is no guarantee for secrecy, as sufficient elements are available for the different positions to be attributed to the respective participant. Leading the analysis at group level blurs such details out and allows us to maintain the confidentiality we promised to our interviewees. For all the

[55] See for example A4.1.2., A4.1.3.1., A4.1.3.5., and A4.2.2. on the characterisation of groups in general and on K+S and Niedersachsen in particular.

reasons above, we will aggregate, process and present the criteria extracted from the interviews group by group.

We also aggregate the criteria based on time. Interviews from the first round (July/August 2009) provide information both on what was important at the beginning of the process and what was important at that point in time. This latter point was explored a second time in the second round (November/December 2009). Chapter 5, not distinguishing on who raises criteria, has shown that the two rounds do not differ concerning the sets of criteria they produce. The sets from the two sources (first and second round of interviews) were thus integrated, maintaining the information on the group that endorses the argument. Correspondingly, the criteria referring to the beginning of the process (first round) were integrated with the written statements handed in by the participants in early 2008. The two sets were then merged so as to allow for a comparison between the situation ex-ante and the situation ex-post. Table 6.1 reports the resulting set of criteria[56].

Criteria	Adm.	Env.	Ind.	Rip.
Economic criteria				
Reduce damage to infrastructure	–	=	.	.
Consider construction and operational costs for K+S	+	=	=	+
Maintain present potash production and allow future one	–	+	+	.
Consider the sensibility of investments	=	+	+	.
Individual measures must pay off	.	+	=	+
Environmental criteria				
Solve the problem instead of shifting it	=	.	.	+
Achieve a good ecological status	–	–	.	.
Durably reduce salt loads	–	=	=	.
Stop surface discharges and underground injection	+	=	.	+
Remove the heaps	+	=	.	+
Provide relief for Werra, Weser and the underground	+	=	.	–
Improve the watershed's quality/ecology	+	=	.	.
Do not affect the North Sea	+	=	.	.
Minimise interventions on nature and landscape	+	+	.	.
Consider the environmental impact/ecological balance of the interventions	.	=	=	=
Consider further environmental pressures, beside salt	.	–	–	.
Durably protect drinking water supply	.	.	+	–
Legal/administrative criteria				

[56] The merging certainly involved a loss of *precision* in the dataset. It however produced an increase in *robustness* through the higher amount of coded materials. Given the apparent homogeneity in the partial datasets (present criteria from the 1st Round being very close to the present criteria to the 2dn Round and being the two rounds only a few months apart and both very close to the end of the process) we can prefer the latter over the first.

Criteria	Adm.	Env.	Ind.	Rip.
Implement the EuWFD within the deadlines	=	–	.	.
Lower and further differentiate the water quality thresholds	–	=	.	.
Consider the feasibility of the implementation process	+	+	–	.
Social criteria				
Ensure employment	=	=	=	–
Technical criteria				
Involve as much local abatement as possible	=	+	.	+
Decrease the amount of waste per extracted ton of salt	–	=	.	–
Consider realistic solutions (e.g. probability of success, technical feasibility)	–	–	.	+
Dispose of the remaining waste in an environmentally friendly way	.	=	+	.
Allow for technical development	.	.	+	–
Time-related criteria				
Durable solution of the problem	=	=	.	+
Consider the production phase-out	–	+	+	+
Solution over a time frame	–	.	=	–

Legend
Criteria present both ex ante and ex post: "="
Criteria present ex ante and missing ex post: "–"
Criteria missing ex ante and present ex post: "+"
Criteria missing both ex ante and ex post: "."
Adm. = Administration group
Env. = Environment group
Ind. = Industry group
Rip. = Riparian communities group

Table 6.1 – Criteria extracted from the interviews over time.

While reading the table, the reader shall consider a few specificities in connection with the theoretical construct of Chapter 3. Both while carrying out the interviews and while analysing and coding them, we tried to extract underlying criteria from purely functional ones as much as consciously possible. Criteria that clearly and openly served an underlying purpose on the basis of a specific, explicitly mentioned piece of knowledge were thus substituted by this underlying purpose.

An example may clarify. For our analytical framework, statements on the importance of preserving the North Sea environment “per se” are different from statements concerning the importance protecting the North Sea for the sake of avoiding problem-shifting. For some actors the protection of the North Sea was an obvious functional element in the underlying goal of avoiding problem-shifting. The same functional link

was not as clear for others, forcing us to consider the protection of the North Sea as a goal per se in this second case.

The above has implications in the moment interviews are coded. When the functional link is clearly stated, entries could be coded following that link, the case above being coded as “Solve the problem instead of shifting it”. Criteria are otherwise considered standing on their own, leading us to code the entries in the example above as “Do not affect the North Sea”.

This approach explains some apparently counterintuitive entries in Table 6.1. The Administration and the Environment group apparently do not mention the protection of drinking water supply among what is important for them. Both groups actually do mention the protection of drinking water supply in their respective interviews, but not among the criteria they explicitly keep an eye on while assessing the options at hand.

This is both understandable and in line with theory: either one has infinite information-processing capabilities or the number of things to balance against one another while taking decisions must be limited. In our case, we can safely consider the Administration and Environment group as focusing on other dimensions and seeing the goal of protecting drinking water as implicit in and automatically achieved by other criteria[57].

On the same wavelength, the question of duplication is worth addressing. Let’s take the case where “not affecting the North Sea” is not pursued per se but is instead strictly functional to the overarching goal of “solving the problem instead of shifting it”. One may be tempted to see two criteria here. Nonetheless, solutions may be imagined that comply to one criterion while not complying to the other. If we ignore the functional link between the two criteria and consider them independently, we achieve an evaluation which does not correspond to the one conveyed by the interview materials at stake.

We hence stress the need to consider at least the explicit functional ties across criteria during the coding process and avoid duplication as much as possible. It is also worthwhile stressing that this perspective works two ways. On the one hand, there may be “sub-criteria” which correspond to operationalisations of other, pre-

[57] See Chapter 3, Section 3.5.1..

ordered criteria and have no validity per se but only to the extent they contribute to the corresponding overarching ones. On the other hand, there may be major, overarching criteria that are too general or abstract to be considered in a decision process and are only loosely connected to other, more specific objectives. In such cases, the relevant criterion is the specific not the general one.

A good example here is the criterion “solving world hunger” to which K+S contributes as a producer of fertilisers. As it is difficult to establish a direct link between the different options and the problem of famine in the word, this criterion was coded as “continuing present production and allowing future one”, a criterion present in several other interviews. If this may seem arbitrary (and, to an extent, it is), we could nonetheless rely on the knowledge produced throughout the process so as to detect functional links between criteria and proceed with the aggregations.

Conveniently, the knowledge produced by the several expert assessments has general validity within and across groups. None fundamentally questions the assessments, exception made for K+S and Niedersachsen – exceptions the interviews deal with at length. It is therefore safely to assume more or less homogeneous mental models across the whole RT from an ex-post perspective. Relying on this information, we can make at least educated guesses on what is really important for the different groups and proceed with the aggregations accordingly.

Space restrictions make it impossible to provide a detailed account of all aggregations that have led to Table 6.1. As a matter of fact, the original bulk of criteria extracted from the interviews yielded over 350 individual ones. We have brought the list down to less than a tenth of its original size by applying the procedure sketched out above. This has involved a good deal of interpretation. Interpretation is intrinsic and inevitable in whatever coding exercise. It is therefore important for the reader to keep in mind that the present account represents our interpretation of the case, not the result of a procedure that can be endlessly repeated as the experimental method would require.

Coming back to the criteria extracted from the materials, interviewees indulge in process-related issues. They were not asked to do so. The interview focused namely on eliciting the characteristics of their prospective arrangement of preference and what is important for them about it. Nonetheless, the interviewed RT members didn’t

fail to stress in several occasions what is or was important for them about the work at the RT. We have dealt with these criteria in Chapter 5 already, while Chapter 6's focus lies instead on the characteristics of a new arrangement for the salt production at the Werra. We have therefore left out these criteria from the list provided above.

Table 6.1 groups the criteria in five different categories. These categories have no direct link with the structure of the interview. They appear here for the reader's convenience and provide a continuity with the classifications that inductively emerged from Chapter 5. Instead, we need to spend a few words on the right-hand side of the table, showing for each group a synthesis of the criteria's development over time. A legend illustrates the meaning of the symbols appearing in the four columns.

By reading the criteria with an eye on the different columns, we see that two of the four groups "moved" much (Administration, Riparian), while others did less so (Environment, Industry). As one could expect, the Environment group provided a long list of environmental criteria. Noteworthy is that they did so consistently ex ante and ex post. The Industry group focused instead on two core criteria: the maintenance of production per se and the maintenance of employment. Almost whatever other criteria this group mentioned was overtly functional to either goal and thus does not appear in Table 6.1. For both groups we can thus explain the high amount of "equals" and "dots" in their respective columns.

We detect the biggest movements in the sets of criteria by the Administration and the Riparian group. The administration in particular picks up several criteria on the environmental side: many of those criteria with an "equal" on the column of the Environment group (thus present both ex ante and ex post for them) have a "plus" for the Administration, testifying that over time they have turned into criteria the Administration pursues per se, at least in the accounts they provide when asked about what is important for them at the RT. The two groups have thus got closer to one another in the way they formulate the core tenets of the way they evaluate the options at hand. This is mostly due to a movement from the side of the Administration.

The Riparian group, on its side, produced relatively few criteria ahead of the process, focusing instead on process characteristics. Table 6.1 shows a fairly broad uptake of criteria over time across the different ones provided by the other groups at the RT.

6.3. Independent Variable: Minutes

The previous section opens with a remark concerning the nature of the deductive coding performed on the interview materials and on the written statements. The same remark applies to the treatment of the minutes. In Chapter 5, they were thoroughly described by the means of emerging, inductive classifications. We now look at them through the lenses of Chapter 3, distinguishing “what is”, “what affects what”, “what is desirable to consider” and “what is desirable to achieve”.

As already mentioned in Chapter 5, the size of this written source and the need for a punctual analysis argument by argument forced us to extract a sample, representative for the whole source. We did so, obtaining a set of 482 statements based on the procedure detailed out in Chapter 5. From this set, a 10% of the statements pertained “what is desirable to consider”, while, to our surprise, a mere 4% concerned “what is desirable to achieve”.

Compared to the limited incidence of R-laden statements, 63% and 14% percent of the statements are coded as M-laden, respectively addressing “what is” and “what affects what”. Consistently with the focus on substantial matters, we extracted a sub-sample free of references to procedural issues, with no significant change, though. Table 6.2 provides the corresponding frequencies.

Our attention here goes to the R-laden arguments. The frequencies reported in Table 6.2 testify their little incidence compared to the size of the whole sample. We assume here that the minutes constitute a thorough representation of what has been discussed at the RT. If this is the case, Table 6.2 suggests us that the process at the RT put comparatively little effort in eliciting and articulating the participants’ positions and interests.

However, an alternative hypothesis can be formulated. Actual discussions taking place at the RT and concerning the articulation of the different interests at stake may have been removed altogether from the minutes (for whatever reason, e.g. confidentiality). Indeed, the communication policy of the RT requires individual

positions not to be disclosed. This requirement may have been interpreted extensively, going beyond anonymization and leading entire "value-laden" passages to be omitted. This could explain the limited incidence of R-laden arguments. It is worth noting that, if this was the case, the minutes would not be fully representative of what was discussed at the RT.

Code	S++	S++*NoPr
What is	304 (0,63)	216 (0,61)
What affects what	69 (0,14)	63 (0,18)
What is desirable to consider	46 (0,10)	43 (0,12)
What is desirable to achieve	21 (0,04)	18 (0,05)
N:	482	355

Table 6.2 – Results of the deductive coding of the minutes.

Relative frequencies in parentheses.

It appears that most of the time has been spent trying to achieve a description of the circumstances at hand ("what is") and their interconnectedness ("what affects what"). This has apparently come to the cost of producing and discussing a set of dimensions structuring the analysis ("what is desirable to consider") and a set of objectives to achieve ("what is desirable to achieve") so as to solve the salinity issue at the Werra.

We can now achieve a more nuanced characterisation of the participants' exposure to R-laden arguments (as detailed out in Chapter 4, Section 4.1.) by relying on the inductive coding. By this, we can produce a synthetic description of what variables to consider and what objectives to achieve came across through these arguments. A more precise approach would consist here in (re)coding R-laden statements based on the criteria from the interviews (see Table 6.1 above).

Given the wide overlapping of the criteria with contents of the inductive coding we can however rely on the rich case description for a characterisation of the relevant statements from the minutes. Both matters of space and the little incidence of R-

laden statements within the minutes support this approach. We thus extract the subsets of non-procedural statements concerning "what is desirable to consider" and "what is desirable to achieve" and present the relative frequencies of the related topics in Table 6.3 and 6.4.

Concerning "what is desirable to consider", economic matters take the lead, followed by employment issues and a broad set of environmental criteria. On the side of "what is desirable to achieve", preferences are revealed concerning specific measures and particular combinations thereof. Above the 90th percentile of this latter subset we also find time as object of R-laden statements.

Code/Topic	**f**	**Freq. Thresholds**
Economicity (*"Wirtschaftlichkeit"*)[58]	0,26 (11)	
Jobs (*"Arbeitsplätze"*)	0,16 (7)	
Effects (*"Auswirkungen"*)[59]	0,16 (7)	>90-Percentile (0,14)
State of disturbance (*"Belastungssituation"*)	0,14 (6)	
Watershed quality (*"Gewässerqualität"*)	0,14 (6)	
Measures (*"Maßnahmen"*)	0,09 (4)	
Production (*"Produktion"*)	0,09 (4)	
Time (*"Zeit"*)	0,09 (4)	>75-Percentile (0,07)
N:	43	

Table 6.3 – Topics of R-laden arguments (Consider) by frequency above the 75th percentile. Absolute frequencies in parentheses.

Code/Topic	**f**	**Freq. Thresholds**
Measures (*"Maßnahmen"*)	0,72 (13)	
Solutions (*"Lösungsansätze"*)	0,22 (4)	
Time (*"Zeit"*)	0,17 (3)	>90-Percentile (0,11)
K+S (*"K+S"*)	0,11 (2)	
Consensus (*"Konsens"*)	0,11 (2)	
Available Information (*"Vorhandene Information"*)	0,11 (2)	>75-Percentile (0,06)
N:	18	

Table 6.4 – Topics of R-laden arguments (Prefer) by frequency above the 75th percentile. Absolute frequencies in parentheses.

[58] These are arguments pertaining the business-dimension of the issue, both in financial terms (expenditures, investments, availability of funds, value and rating of the company's shares, etc.) and in economic terms (profitability, returns on investments, distribution of dividends, etc.).
[59] Here we deal with the general effects of specific measures and practices on the environment.

Given this exposure, we would expect the criteria examined in the previous section to shift accordingly. First, RT Members have been exposed to arguments stating the importance of considering economic matters, leading us to expect an increased endorsement of economic criteria. Second, RT Members have been exposed to arguments concerning the desirability of realising certain measures. More specifically, most statements concerning "what is desirable to achieve" support the realisation of a pipeline. We would thus expect the compatibility between the criteria and these measures to increase. Finally, the low frequencies of both type of R-laden arguments would lead us to expect only mild changes.

6.4. Discussion: Linking the Dependent and the Independent Variable

We have so far detected certain changes in the dependent variable "criteria". We can thus support the claim that a change in the heuristics adopted by the RT Members so as to identify their individual arrangement of preference took place over time. Analytically speaking: $\partial R/\partial t \neq 0$. With the above, we could also characterise the independent variable "process", $\partial P/\partial t$, providing an overview of what arguments were voiced over time. At this point, our goal is to focus on $\partial R/\partial P$: does the change in criteria detected with $\partial R/\partial t$ become a matter of course if $\partial P/\partial t$ is considered?

While exploring $\partial P/\partial t$, we have observed three things: 1) the low incidence of value related arguments compared to descriptive ones; 2) a strong call for consideration of economic criteria, above social and environmental ones; 3) preferences expressed for specific measures and their combination 'per se' rather than for what they achieve. Is this confirmed by what we see in Table 6.1? Looking at it, a strong uptake of economic criteria is undeniable, even though the most nuanced developments concern the environmental criteria and not the economic ones.

The fact, instead, that statements clearly expressed preferences for measures and solutions per se and not for their elements, makes a direct connection to the criteria behind these "revealed preferences" difficult to ascertain and thus to read out of Table 6.1. In other words, the minutes do not explicitly help us identify the reasons

why certain measures and solutions, the pipeline most of all, are preferred to others: all we have is a rather detailed description (roughly 60% statements alone on “what is”), the result (most of the 5% statements on “what is desirable to achieve” return that the pipeline is preferred), and almost no explicit articulation of why exactly this is so.

In order to fill this gap, we can however perform a thought experiment by the means of a quick-and-dirty evaluation of the options considered by the RT. We have indeed all the necessary elements so as to simulate the core of the deliberation the RT went through in order to produce a recommendation. First, through the analysis performed in this chapter we have both an initial and a final set of criteria (see above). Second, from the rich case description of Chapter 5 we have a good knowledge of the way RT Members see the two main elements of the decision and the terms of the decision process. Third, the decision output is known. Can we find consistency between these three elements? Is the observed change in criteria (R) consistent with the decision output the RT has come to (A*), given what participants knew about and thought of the options at hand (M)?

For the reader’s convenience, we will briefly sketch the terms of the decision. In the course of the events, the Measures Package (“MP” in the following) becomes object of a binding decision through the Public-Law Agreement between K+S and the State Administrations of Thuringia and Hessen. It is thus not object of decision anymore. The status quo for the decision changes accordingly, moving towards the question of which measures are to complement the agreement, as the MP alone is clearly not sufficient. The elements potentially complementing the MP are two: the pipeline and the NIS. Table 6.5 provides a likely evaluation of the two options on the basis of the information made available throughout the process.

We do not have the elements to produce a set of relative weights between criteria. We thus have to conduct the evaluation at a fully disaggregated level. We can nonetheless choose a convenient scoring system, based on three labels: “Superior”, “No” and “Feasible”, respectively showing when the two options, based on the available information, can be safely considered superior, clearly cannot match the given criteria or fall somewhere in between.

Criteria	MP+NIS	MP+Pipe	Note
Reduce damage to infrastructure	Feasible	Superior	(1)
Consider construction and operational costs for K+S	Superior	Feasible	(2)
Maintain present potash production and allow future one	No	Superior	(3)
Consider the sensibility of investments	Feasible	Superior	(4)
Individual measures must pay off	Feasible	No	(5)
Solve the problem instead of shifting it	No	Superior	(6)
Achieve a good ecological status	No	Superior	(7)
Durably reduce salt loads	Feasible	Feasible	(8)
Stop surface discharges and underground injection	No	Superior	(9)
Remove the heaps	No	Superior	(10)
Provide relief for Werra, Weser and the underground	Feasible	Superior	(11)
Improve the watershed's quality/ecology	No	Feasible	(12)
Do not affect the North Sea	Feasible	Feasible	(13)
Minimise interventions on nature and landscape	Superior	Feasible	(14)
Consider the environmental impact/ecological balance of the interventions	No	Feasible	(15)
Consider further environmental pressures, beside salt	No	No	(16)
Durably protect drinking water supply	No	Superior	(17)
Implement the EuWFD within the deadlines	No	Superior	(18)
Lower and further differentiate the water quality thresholds	No	Superior	(19)
Consider the feasibility of the implementation process	No	Feasible	(20)
Ensure employment	No	Superior	(21)
Involve as much local abatement as possible	Superior	Feasible	(22)
Decrease the amount of waste per extracted ton of salt	Feasible	Feasible	(23)
Consider realistic solutions (e.g. probability of success, technical feasibility)	No	Superior	(24)
Dispose of the remaining waste in an environmentally friendly way	No	Superior	(25)
Allow for technical development	Superior	No	(26)
Durable solution of the problem	No	Superior	(27)
Consider the production phase-out	No	Superior	(28)
Solution over a time frame	Superior	No	(29)

Table 6.5 – Likely evaluation of the options based on the criteria from the interviews.

The specific line of reasoning for each criterion can be found in this footnote[60]. A quick look at Table 6.5 is however sufficient to understand that it would take a

[60] Assumptions: (1) Depends on salt load in the river (MP) and from the possibility to pump salt water out of the underground (Pipeline positive, NIS positive, close to neutral). (2) Pipeline is more expensive than NIS. (3) Assumes closure without the pipeline. (4) Environmental benefits vs. monetary investments. Monetary costs for the pipeline are a multiple of those for the NIS, the environmental benefits are way higher. (5) Measures must lead to savings and/or revenues above their individual costs. This is given for the MP and may be so for the NIS. The Pipeline on itself barely generates revenues and must be paid through other (core) income sources. (6) The overall solution must have a positive environmental balance. NIS relies on the further disposal into underground and river and thus has a negative environmental balance. (7) A good ecological status cannot be reached with the NIS. (8) Depends on MP. (9) NIS relies on further injection and further discharge into the river, albeit lower. (10) Not foreseen by NIS. (11) NIS provides a certain relief to the rivers but only a minor relief to the underground. Pipeline provides a complete relief to both rivers and the underground from present man-made pressures and a certain relief from the diffuse pollution. (12) NIS does not allow for a reduction of the salt load that allows for an ecological betterment. (13) Depends on salt load and impact of construction sites (assumed nil, however). Niedersachsen has a different opinion. (14) Depends on the impact of the pipeline construction sites (15) NIS does not have a positive environmental balance. Pipeline may or may not. (16) None of the options

strongly asymmetric set of relative weights to make the “MP+NIS” option superior to the “MP+Pipeline” one. However unlikely, this still may or may not be the case. What is however interesting for us is that the transition from the ex-ante to the ex-post set of criteria tends to strengthen this *likely superiority* of the MP+Pipeline option.

We can observe the following for all groups: the number of “Superior” and “Feasible” scores obtained by the “MP+Pipeline” option is always higher than that obtained by the “MP+NIS” option. This is so for the ex-ante as well as for the ex-post set of criteria, as shown in Table 6.6 below. Similarly the number of “No” scores is always lower for the “MP+Pipeline” solution, ex ante as well as ex post. Full dominance is not the case, as no option scores better than the other for all criteria considered[61]. Superiority is hence a matter of relative weights, which are however not available.

Based on this evaluation, we cannot say whether either option is absolutely preferable to the other. This is so for both ex-ante and ex-post criteria. We know, however, that the ex-post criteria led to a recommendation which indeed sees the pipeline solution as the preferred one and sees the NIS as something at best to further develop. This outcome would be consistent with a rather homogeneous set of relative weights. A similar assumption would be rather strong elsewhere. At this point of the analysis, however, it is rather safe: by now, all strictly functional criteria have been screened out and only criteria have remained that “count” fairly independently of one another. They all must be at least “feasible” for an option to be desirable.

We can now introduce $\partial R/\partial t$. Let’s look at the difference between the number of “Superior” and ”Feasible” scores gathered by the “MP+Pipeline” and those gathered by the “MP+NIS” solution, as in Table 6.6. We can see that, for the Industry and

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foresees this. (17) Depends on the reliance on the underground. (18) NIS is only WFD-compatible if an exception regime can be obtained. (19) Depends on salt loads over time. (20) Depends on the legal compatibility of the injection (negative for NIS without pipeline) and on the rapidity of reduction of the salt loads (negative for pipeline alone). K+S has a different opinion. (21) Assumes closure without the pipeline. (22) Depends on the combined effect of MP and NIS. (23) Depends on MP only: e.g. MP+NIS produces the same amount of waste than MP alone, part of it is then disposed of in the underground. (24) NIS is highly experimental. Its success is not considered realistic. (25) The impact of the discharge in the North Sea is assumed nil. MP+Pipeline has the same impact of MP+NIS but only for a limited time period, hence scores better. (26) Depends negatively on the amount of investments already done (= with pipeline, no further investments). (27) Underground (NIS) and surface waters are assumed not available indefinitely. MP+Pipeline may make it "on time" with appropriate temporary measures and/or with an exceptional, one-time renewal of the authorisations. (28) Depends on the availability of the pipeline. (29) Assumes no further investments in abatement in case of a Pipeline.

[61] Please note: dominance is a technical term in Game Theory. Whenever the superiority of a certain outcome over other ones is expected to depend on a certain variable, a dominant outcome is one which is consistently superior for the full domain of the given variable, making the superiority of the given outcome actually independent of the variable at play.

Riparian group, a transition from the ex-ante to the ex-post set of criteria increases such difference. The difference remains constant for the Administration group and becomes actually lower for the Environment group. The same can be said concerning the "No" scores.

Administration	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	6	6		9	8	
MP+Pipe	14	14	=	1	0	=
Diff.	8	8	P-A=0	-8	-8	-(P-A)=0
Environment	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	6	10	↘	12	11	↘
MP+Pipe	17	20		1	1	
Diff.	11	10	P-A<0	-11	-10	-(P-A)<0
Industry	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	4	6	↗	4	6	↗
MP+Pipe	5	9		3	3	
Diff.	1	3	P-A>0	-1	-3	-(P-A)>0
Riparian	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	4	3	↗	3	7	↗
MP+Pipe	5	9		2	1	
Diff.	1	6	P-A>0	-1	-6	-(P-A)>0

Legend
A: Ex ante
P: Ex post

Table 6.6 – Disaggregated output of the evaluation criteria by group.

Increases mean here that more "good reasons" for the "MP+Pipeline" and against the "MP+NIS" option emerge as a product of the change of criteria $\partial R/\partial t$. This property of the evaluation holds regardless of the relative weights possibly used so as to aggregate the scores, at least for two groups out of four. If we then restrict the criteria to those ones expressed by at least two or even three groups[62], the transition

[62] Please note: only a few criteria are expressed by all four groups.

produces these type of increases for all groups and not just for the Riparian and the Industry group. This result is shown in Table 6.7 below.

Administration	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	4	6	↗	6	7	↗
MP+Pipe	9	13		1	0	
Diff.	5	7	P-A>0	-5	-7	-(P-A)>0

Environment	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	5	8	↗	8	10	↗
MP+Pipe	12	17		1	1	
Diff.	7	9	P-A>0	-7	-9	-(P-A)>0

Industry	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	3	4	↗	3	5	↗
MP+Pipe	4	8		2	1	
Diff.	1	4	P-A>0	-1	-4	-(P-A)>0

Riparian	**Superior/Feasible**			**No**		
	A	P		A	P	
MP+NIS	3	3	↗	2	6	↗
MP+Pipe	4	8		1	1	
Diff.	1	5	P-A>0	-1	-5	-(P-A)>0

Legend
A: Ex ante
P: Ex post

Table 6.7 – Disaggregated output of the evaluation criteria by group restricted to criteria endorsed by at least 2 groups.

Criteria expressed by several groups can be considered as resting on fairly shared understandings. For these criteria, the transition captured by $\partial R/\partial t$ best contributes to strengthening the superiority of the “MP+Pipeline” solution over the “MP+NIS” one. Our interpretation of this goes as follows: on those specific matters where participants had a common ground (possibly after lengthy technical discussions), they all adjusted their own criteria in favour of the pipeline solution. Certainly, this outcome ultimately depends on the relative weights between criteria. It definitely

constitutes a robust outcome in a world where all criteria count more or less the same – and we have seen it is safe to assume so here.

We can now introduce the perspective of the RT discussions and move in the direction of ∂P/∂t. We have shown that these discussions were very technical in nature and left little space for articulating and reflecting on mutual positions. Nonetheless, we know from Chapter 5 that RT members had a certain idea of what is important for one another and, throughout the process, witnessed some changes there. This is so despite the little trace left of this in the minutes. Our interpretation here goes as following: 1) throughout the process, they were exposed to plenty of technical information on all kinds of measures and, to a small extent, to statements of preference towards the pipeline solution; 2) they could read in that a sign of the increasingly likely superiority of the pipeline solution; 3) this may have constituted the overarching, though seldom outspoken, R-laden argument that has triggered the change we observe in ∂R/∂t.

Our observation is namely that, over time, they adjusted the way they formulate what is important to them so as to better adhere to the solution which was emerging as the collectively preferred one. In these terms, we can see a certain consistency between the change in criteria that we have observed and the developments of the discussions at the RT emerging from the minutes. This is what we intended to test. Our hypothesis seems to be confirmed by this interpretation of the data.

On the other side, the change in the dependent variable “criteria” seems to come about through a different mechanism than the one we initially postulated. It seems unlikely that the change of criteria certainly did come about only because of the exposure to the small bundle of R-laden arguments detected in the minutes. Instead, it appears that RT Members were able to gauge each other’s motivation and the related development (as interviews confirm they did) by other means than the R-laden arguments we could extract from the minutes. If this applies, they could see a majority for the pipeline solution coming. This may have worked as a strong, though subtle, R-laden argument – the one, we couldn’t find in the minutes.

Our hypothesis is not properly refuted by the lack of R-laden arguments in the minutes. It would have been so if, despite an intense exposure to R-laden arguments**,** we would have observed no changes in criteria or inconsistent ones.

Instead, the R-laden arguments played a consistent (albeit minor) role in the change of criteria, as our reconstruction shows. Thus, in order to be consistent with this minor role of explicitly voiced R-laden arguments, we need to find an explanation of the ∂R/∂P link where criteria play a concurrent but not central role for the endorsement of the pipeline option.

If we look at the ex-ante criteria under the assumption of rather homogeneous relative weights, we notice that the transition from the ex-ante to the ex-post criteria was substantially not necessary: under rather homogeneous relative weights, the pipeline is superior already ex-ante. The transition may strengthen this circumstance but it's not necessary for the outcome of our simulated evaluation to change. We would therefore rather not talk of a consensus-oriented change in criteria, consciously aimed at making space for a common solution. Instead our impression is of a co-evolution of the criteria set along with the solution: the stronger the pipeline option became (as an effect of the M-laden technical examinations, given the current sets of criteria), the closer the groups' criteria sets adhered to it.

If this is the case, the change in criteria we observe is a by-product of the technical examinations. It is not a product of the mutual understanding produced throughout the process and the connected mutual learning experience. From this perspective, the RT Members did not come towards one another so as to make room for an otherwise impossible joint solution. Instead, the technical examinations provided a solution which had the potential to meet all groups' criteria as they were in the beginning. Criteria then moved towards that solution and strengthened its position. Incidentally, they happened to converge in the process of doing so.

6.5. Conclusions

The overarching objective of this work is to explore the nexus between socio-ecological arrangements and the deliberative process of distributing entitlements and obligations among involved actors. Chapter 3 has explored the Economics literature on institutions and environmental distribution conflicts and produced an analytical framework. With the present Chapter 6, we have explored specific empirical materials so as to test the hypothesis underlying the analytical framework.

Materials have proven somehow less suitable than expected for testing our hypothesis. Specifically, the process emerging from the RT minutes is one focusing on the technical and procedural aspects of the options at hand. Very little space was left to the articulation of the different positions and for the discussion of the relevant criteria for a shared solution. Criteria leave little traces in the minutes. Hence, it is difficult to establish a direct link between the criteria that were voiced during the process and the ones that were taken up or rejected in the interviews.

Nonetheless, the rich case description performed in Chapter 5 helped us achieve a coherent picture: we could detect consistency between the change in criteria used by the RT Members and the arguments voiced throughout the process. In order to do so, however, we had to account for different and less explicit mechanisms producing the observed change of criteria. Specifically, we expected to observe a certain degree of causality between the exposure to preferences and the development of the criteria adopted by the different groups. Instead, we have observed a co-evolution between the two variables, where values and options strengthen one another: values identify a preferred option and subsequently gather around it.

In the following, we intend to concentrate on the implications of our findings on two different accounts. On the one hand, we intend to explore what this means for the RT process, also in the light of the rich case description from Chapter 5, and, more in general for participatory processes in environmental decision-making. On the other hand, we intend to review our findings in the light of the theoretical debate that has produced both our hypothesis and our analytical framework. It is important for us to see whether this can return interesting insights confirming or refuting those contributions that have most shaped our approach. We will then move on the

concluding Chapter 7 and explore possible implications for the research context described in Chapter 2, including the research project and the other case studies, and for the more general questions formulated in the opening Chapter 1.

6.5.1. Implications for the RT process and for participation in environmental decision-making

Our analysis was centred on the relative role of motivation and knowledge in environmental decision-making situations. On this matter, the process design of the RT takes a specific stand: to focus on objectiveness and scientific thoroughness in order to mediate and ultimately solve a conflict situation. From this point of view, the little incidence of value-related statements in the minutes is not surprising: values were not meant to be articulated at the RT.

The process relies instead on the idea that, by increasing “knowledge” in the RT Members, the range of options will coincide with one and only one solution, making the selection of a shared arrangement a matter of course and not a matter of choice anymore. In these terms, the core idea of the process was antithetic to our research: to make sure that $\partial M/\partial t$ is strong enough for all actors to identify one and the same solution as the one to go for, all else being either unfeasible or not up to the task.

The process certainly pursued this objective consistently. Our analysis of $\partial P/\partial t$ strongly confirms that. Nonetheless, the process substantially failed: while a majority could be found that supported the pipeline solution, two important actors didn’t move at all, namely the State Niedersachsen and the very company K+S, compromising the whole effort. The co-evolution of values and knowledge that we detected for every group as a whole did not take place for these two individual actors. This raises the question, whether the process design was compatible with a co-evolution of values and knowledge, even if by accident.

Structuring a process on the idea that knowledge and values affect one another implies that, if one changes, the other changes too. If values are to change, two characteristics of the process design appear central: first, RT Members must be in

the position to make choices in the name of the groups they represent; second, they must be in the position to let their own position “co-evolve” with the one of their home institutions. For both aspects, the actual design of the RT process stands in the way.

First, only a few RT Members are in the position to make choices for their home institutions. On the contrary, they are not always able to understand and/or openly communicate it. A good example of this is the role of politics as described in Chapter 5: an arbitrary, unpredictable, external force. RT Members representing State Administrations are all technicians, bound to the application of the law “as it is” and to the political goals of their home parliaments. Certainly, interpretation creates spaces for choice and value judgement to be filled with discretion. Politics seems however to exploit this space from outside almost to the full extent. This leads us to the second aspect.

The link between the developments at the RT and those in the home institutions happens on two lanes: 1) the “reporting” activity of the RT member themselves (including their peers in the observer ranks); and 2) the actions of the Chair of the RT. Both aspects are affected by the communication policy of the RT: in particular by the requirement not to disclose positions. As an example, let’s assume that the opposition of K+S to the pipeline is already clear through “corridor talks” (which do not appear on the minutes and are therefore off the records): RT Members would not be able to disclose it, nor to openly adjust their respective positions accordingly.

While entertaining a dialogue with their home institutions, RT Members can only rely on the scientific evidence emerging from the assessments (knowledge, M), not on what others make of it (values, R). This is so because they cannot disclose what others make of it nor do they actually spend much time discussing and articulating it. If this happens at all, it does so off the record (e.g. via corridor talks) and/or in a highly interpretative way (gauging values from reactions to measures, not from the open discussion thereof), in spite of all the rhetoric of transparency and mutual understanding. This also applies for the Director as well in his duties of speaking for the RT as a whole.

We have no doubt that the choices behind the RT’s process design were made carefully. We would hardly believe that the idea behind the RT was to pursue a technocratic dream of solving long-lasting conflicts through better knowledge and

engineering. If the articulation of positions and the discussion of specific topics were left out of the process, we guess there were overriding matters causing this. As a matter of fact, the endorsement of the same knowledge would have been way more problematic without the RT. Several interviews report as a merit of the RT the fact of finally having produced “neutral”, third party knowledge on the case, even though its endorsement is still not complete.

If the goal, though, was to stay away from those aspects of the issue which are value-related and/or politically sensitive, a mediated modelling exercise would have probably been more suitable and less costly regarding everybody’s time and effort: releasing the pressure on a common recommendation and focusing on collectively understanding the “science” of the issue (which is apparently the core contribution of the RT, see Appendix 4, Subsection A4.1.3.5. and Chapter 5, Subsection 5.2.3.3.) would have probably sorted the same “value-free” learning experience among RT Members without forcing them to behave strategically in the face of the possible commitments to any prescriptions.

One may counter-argue, that a process without a prescription would not have been politically and/or substantially interesting for the involved parties. For many participants, the RT does not decide anything, though. Substantial achievements were not even a target for some of them. This circumstance downsizes the implications of similar counterarguments. The ambiguity surrounding the uptake of the “failed” decision output in the press similarly supports our point of view.

6.5.2. Implications for Institutional Economics

Before we look back at the theoretical foundations of this work so as to outline the implications of our findings, it is important to repeat what has been stressed before: this work has no ambitions in terms of Experimental Economics. We are interested in institutions. The right question for us is therefore not “What do we know now about human beings and decision-makers that we did not know before?” but rather “What do we know now about institutions (in participatory environmental decision-making) that we did not know before?”. This subsection tries to formulate a few answers to

this latter question, concentrating on the two core issues put forward by our theoretical inquiry: motivation and knowledge.

Concerning motivation, we have distinguished static and dynamic approaches (see Chapter 3, Subsection 3.9.3.1.). In the first case, actors are seen statically in their preference sets and behavioural assumptions, while in the second case such parameters allow for diversity and change, both based on varying sets of variables. While the main concern is the efficiency of given arrangements in the first case, the second type of approaches aims at characterising the specific efficiency actual arrangements try to achieve. The question basically shifts from “Is it worth it?” to “In which sense is it worth it?”.

Our analysis certainly belongs to the second kind: by observing a shift in the criteria adopted, we can actually see how the “value” of the preferred arrangement changes over time, as the specific trade-offs implicit in each of the criteria change their terms. Each one of them corresponds to a specific endowment, implies a certain distribution of rights and the definition of particular duties. By changing the terms of the choice, actors review what they are ready or not ready to give up for the sake of the new arrangement and thus they redefine the costs and burdens they are ready or not ready to take upon themselves. They review their very definition of the costs and benefits they perceive connected with the choice at hand.

The elicitation of these criteria, under the assumption of their mutual independence, also allows us to characterise the typologies of costs involved in a similar process of collaborative and deliberative institutional change. We have dealt with a process trying to identify a desirable amount of abatement to be performed by a polluter, as if out of the handbook. What we have encountered is however a process where individual interventions (local abatement, NIS, pipeline) are worth per se rather than for what they achieve. They are pursued in terms that go beyond the distribution of abatement, mitigation and opportunity costs between both sides of a Coasean bargain.

As an example, the pipeline makes most interventions within the Measures Package (MP) substantially useless, not to mention an additional NIS. The narrative confirms, though, that the MP has to be realised nonetheless. This has a rationale not just in bridging the construction time of the pipeline but rather in triggering further

improvements of the state of the art in salt extraction. Nobody knows whether these improvements will actually come about, nor can one say that the MP is explicitly functional to producing them. The consideration, however, of a loose connection between the two objectives (MP and an improved state of the art in salt extraction) makes the MP an objective ‘per se’, at least for the time being.

This changes the terms of our Coasean bargain significantly. The MP has to be realised, but not because less costly than the environmental damage that would occur without it. It has to be realised because, regardless of its effectiveness, it sets a precedent for the further development of the salt extraction industry, and this is priceless. In other words. The costs involved here do not only consist in the environmental damage produced by the extraction activities of K+S: they also involve opportunity costs in technical future development, in turn affecting prospective abatement frontiers. If this is the case, the comparison between environmental and abatement costs falls short of the entire industrial relevance of the trade off at stake.

What is more, this may or may not be the case but it is certainly the way some actors see the decision here. Assessing a different “optimal” arrangement on the basis of a different account of “what counts” can only be justified if the analyst knows better. A positive understanding of the terms of the trade-off requires instead an ethnographic inquiry as performed here through the interviews. Here is where our findings may make a difference, and we show it below.

First of all, criteria seem to change throughout the process, with the straightforward implication that ex-ante assessments may produce biased insights and return biased results. In our case, the change was not sufficient to (and actually not meant to) alter the outcome, this may however be a special case. More important is that the criteria seem to change throughout the process because of the process itself. The straightforward implication is that a process-blind assessment based only on substantial criteria would be doomed to an ex-ante bias. Furthermore different processes, hence different process designs, may lead to different arrangements starting from the same initial situation based on the effects they have (including no effect) on the criteria at play.

In terms of process design, the latter circumstance translates into the question, whether skilfully choosing process characteristics may return arrangements bearing

intended substantial characteristics[63]. We can rephrase as follows: can substantial aims be pursued by skilfully choosing process characteristics? If this is the case we can read given arrangements more or less as a function of what is substantially important for "conveners", for those in charge of designing the decision-making process. More specifically, the presumption of efficiency concerning a specific arrangement should be defined not in Pareto-related terms, with or without consideration for social costs. Instead the terms for the presumption of efficiency would be dictated from the conveners only, including their very own understanding of what things possibly count or do not count as social costs.

This case has very practical relevance as it covers the recurrent claims and allegations of manipulation in participatory processes. We can clarify through an example. Take a fictional environmental NGO whose objective is to preserve nature. If that is the case, our NGO has a clear substantial goal to pursue and, consistently, would enter participatory processes not for process related values (e.g.: cooperation in environmental management, democracy, self determination, caring for the poor population who is affected by environmental degradation, etc.) but for the promise of a substantial return: improvements in the ecological status of a certain ecosystem, however defined.

Imagine now that our NGO is given the possibility to affect or even determine the design of a process (in the worst case by choosing whether to participate or not): that NGO would ideally go for the design that brings about the most and largest ecological betterments. It hence would be pursuing substantial goals by the means of procedural choices. Process design choices would then be made so as to influence or pre-determine a certain substantial outcome – they would thus constitute a case of manipulation. This is clearly a highly hypothetical case: real-life situations are simply too complex. It is nonetheless a perspective worth exploring as we have heard perspectives of this kind in several workshops outside of the RT context[64].

[63] Please note: the difference here is between the substantial and the procedural dimension of the process design in relation to its output and/or outcome. If procedural aspects (e.g. representativeness, transparency, democratic profile, etc.) are valued per se, translating them into a process design is a straightforward endeavour. If, instead, procedural aspects are valued because functional to specific substantial outcomes, their consistent translation into process design ideally requires a one-to-one link to be established between design and output/outcomes, so that a design can be chosen accordingly.

[64] Please note that none of the environmental NGOs represented at the RT takes a similar position. Our choice of the example is per se fictional.

Let us leave morals aside and concentrate on the Institutional Economics of the issue. Let us consider the unlikely and remote possibility that one could design and run an entire process so as to provide the right information (M) to the right type of rationality (R) so as have enough participants converge on a certain arrangement (A*). Should we then read the arrangement eventually produced as the efficient one from the perspective of the convener (here, our fictional NGO) given the available knowledge?

In the light of this analysis and the likely co-evolutionary relationship between knowledge and values, our answer is no: our findings would suggest that a similar attempt is bound to fail and reach other outcomes than the initially aimed ones, even in the highly remote case manipulation works as intended.

The success of a similarly manipulative exercise would indeed rest on the possibility to trigger ad-hoc changes in the participants' positions. For known and constant or, at least, knowledge-independent values, manipulation would consist in feeding ad-hoc information into the process so as to obtain the desired position and thus the desired decision output.

Analytically, each individually preferred arrangement is a function of a given rationality and mental model: $A = f(R; M)$, where R is known and constant, so that A becomes a function of M, allowing for potentially whatever A to be achieved with the right, "manipulation optimal" M. If values and knowledge, though, change co-evolutionarily, ad-hoc knowledge (M) leading to the desired, "manipulation-optimal" individual positions (A, given initial values) does not necessarily exist and is likely to produce changes in values (R) that, in turn, may affect the endorsement of further information and lead to different individual A's.

In our case, furthermore, the co-evolution of knowledge and values has passed through consensus. It has taken a likely-superior option, the pipeline, for criteria to converge on it as information kept feeding into the process. Structuring a participatory design able to achieve the same developments in an ad-hoc fashion would require a convener able to reproduce the same "pull" the pipeline has had on the participants at the RT or, alternatively, a situation where participants are basically already convinced and simply need good arguments so as to support their choice. In this latter case manipulation doesn't seem necessary.

On a similar note, our account of the Werra case confirms the importance of Bromley's take on the way information enters a decision. Bromley warns us not to simply account for the accumulation of individual pieces of information but to follow how claims are accepted or rejected throughout the whole conversation taking place among actors. He stresses thereby plausibility, convenience and authority as discriminating factors for a piece of information to enter a decision process and affect its outcomes (or not).

The point on plausibility suggests a piecemeal approach to information: a piece of knowledge is new when it constitutes something participants didn't know before. In order to be plausible, though, it has to "fit" with other, pre-existing pieces of information or at least to produce the least friction with them. We see how such a requirement strongly restricts *what individuals may or may not be ready to understand*. We also see that it takes iterative and incremental exposures for "revolutionary" (surprising, unexpected, unlikely) pieces of knowledge to enter the mental models of the individuals. If coming to terms with the existence of certain circumstances produces too much friction, additional observations may pave the way by re-arranging those prior pieces of knowledge that are responsible for the very same friction.

A similar approach would explain the high number of expert assessments produced by the RT on very punctual, narrowly focused topics, often in the absence of a systemic view. As an example, the rhetoric of employment plays a strong role all over the process. Nonetheless, no assessment has been made that links jobs and abatement measures. Instead, the realisation costs of the different measures have been compared against the monetarisation of the environmental damage, and this comparison has been complemented by the amount of taxes and household incomes are connected to the activities of K+S (Döring et al. 2009, respectively pp. 94-100 (part on environmental costs) and pp. 37-40 (part on employment and fiscal effect)).

Can we link the two pieces of information? No. We know that the environmental costs are much higher than the construction costs for the pipeline but we don't know how much income K+S will distribute in terms of incomes and taxes *as an effect of the different options*, regardless of how big these numbers may be at the present level of operations (and abatement). That information is central so as to address the social-

environmental-economic question faced by the RT because it represents the causality link between abatement and employment. It has not been addressed, though. What is more, a preferred arrangement has been selected in the absence of this information. Is this surprising? According to Bromley, it's not: information needs to enter the process piece by piece, removing obstacles one by one, each piece of information making sure that the next one is plausible.

The point on convenience and authority allows us then to appreciate the implication of our findings. According to Bromley, information is taken up more readily if it is coming from authoritative epistemic communities and if it brings "good news". This is strikingly resonant with what we have observed at the RT. First, the dimension of plausibility stressed above relied strongly on expert judgement, focusing on technical expertise in the definition of what is technically "feasible" and "realistic". The plausibility dimension was thus reinforced by the contribution of epistemic communities from "science" and "engineering". Second, the role of these epistemic communities was in turn reinforced by the fact of being summoned through the RT, thus constituting a "neutral" source of knowledge in opposition to "partisan" and "interested" knowledge produced so far by all sides autonomously.

Here is where co-evolution comes in: expert must be perceived as neutral because their findings would otherwise be biased by the interests of their sponsors. Whether information is convenient or not depends on the criteria used for evaluating the different options. Such bias exists, though, only to the extent criteria do not change. What we have witnessed, instead, is that criteria changed along and consistently with the production of knowledge strengthening the superiority of the pipeline option. We can see here a positive feedback coming about, increasing the solidity of the pipeline option. Bromley's point on information holding "cash value" is thus strengthened by our observations.

6.5.3. Summary

The present section has explored the implications of our findings for both the RT and for Institutional Economics. Concerning the RT, we maintain that specific aspects of

the process's design impaired its possibility to accommodate changes in the selection criteria. Point in case are the knowledge-oriented set-up of the process and the communication policy: we believe they impaired the possibilities to fully articulate the values at play, thus forcing an increased degree of guessing and a certain degree of strategic behaviour. Most of all, these aspects of the process were not fully consistent with the claims of transparency of the process design.

From the point of view of Institutional Economics, our findings generally seem to confirm and to an extent strengthen specific trends in the way institutions are seen and understood. Detecting a co-evolution of values and knowledge provides a theoretical counterargument to claims of manipulation in participatory processes. In our analysis, we do allow for persuasion efforts to take place among participants as well as for strategic disclosure of information. Even if such efforts were successful, our analysis suggests that decision outputs would diverge from the ones initially aimed at through manipulative process designs.

Instead, we find that process matters and participation matters with it. Without process, the analysts is likely not to understand the *intended* superiority of chosen arrangements: the specific perspective under which a seemingly puzzling arrangement is, indeed, superior to other ones. Without participation, actors are forced to guess each other's position and are thus bound to second-best solutions, which may surely be statically efficient "given present values and available information", but are thus based on not articulated values and inferior information.

We believe that the RT has contributed strongly in moving the Werra conflict away from this situation. It has however done so on one side only, that of improving information. It didn't put comparable emphasis on articulating and processing values. Eventually, the exclusive use of technical arguments didn't prove sufficient to produce an arrangement yielding everybody's consent: few individual (but powerful) actors in the conflict still oppose the preferred solution, turning a major political success (23 votes in favour of the pipeline solution out of 25) into a substantial failure (a solution that cannot be implemented for the time being).

We will now move on to the concluding Chapter 7 and feed these implications back into the research context described in Chapter 2. More specifically, we will search for implications from the point of view of the research project, GoverNat, in whose frame

this work takes place. Furthermore, we will critically review the other case studies and for the more general questions formulated in the opening Chapter 1.

Chapter 7 – Conclusions

Sections: 7.1. Implications for the case studies and the overall research context; 7.2. Overarching conclusions and outlook.

Chapter 5 and 6 have provided us respectively with a in-depth description of the Werra case and with an analysis of the empirical materials based on Chapter 3's analytical framework. This twofold effort has returned Werra-specific findings. They offer us a perspective on how actors interact so as to produce new governance arrangements, provided the Werra-specific conditions hold. In this final chapter, we intend to broaden the perspective thus provided beyond the Werra case and explore the possibilities to generalise the insights achieved so far. We do so by reviewing the implications and the general plausibility of our findings for the different case studies explored in Chapter 2 and for the GoverNat project more in general. Before we do so, it is important to wrap up the findings.

In the Werra case, we have found a socio-ecological system highly reliant, in some of its regions, on one economic activity: the extraction of salt by K+S. This activity has a broad set of detrimental effects, partly caused by previous abatement strategies. Despite spreading the salt discharge pressure on different environmental media and despite the technological betterments of the last twenty years, the situation still qualifies as a "problem" in the sense sketched in Chapter 1: a situation that persists not because all actors involved are happy with it, but because the same actors are 'held back' from taking action – in this case due to the uncertainties of a likely court litigation[65].

In the last two decades, this situation gave rise to a broad discontent, leading to demonstrations, allegations and a heated debate in the public sphere. With the Round Table (RT in the following), actors were then given a possibility to interact in a different manner. The hope was to achieve a "solution" of the problem: a new arrangement whose stability is not based on the uncertainty of a court litigation and

[65] See Chapter 1, Section 1.2.4. for the meaning of a "problem".

instead relies on the acceptance of all actors involved, seeing themselves sufficiently better-off in the new situation not to challenge it. In technical terms, we describe here a likely transition from a corner solution to a new situation where a presumption of efficiency may be granted. As spelled out in Chapter 1, this implies moving from arrangements that actors *would but can't change* due to structural reasons to arrangements that actors *would not want to change* because they are 'happy' with it.

In the past, actors have dealt with one another in very heated ways. The RT process tried thus to calm down the tenor of the debate by setting on the science behind the RT problem. This was an attempt to provide an *objective and therefore shared* perspective on the matter. Subsequently, the interaction among the actors was technically led. Our analysis shows that, against intuition, little or no articulation of the interest at play formally took place in the process. Goals and objectives were kept at an overarching level and not spelled out in their details and implications. The range of alternative options was narrowed down in terms of *feasibility* and *realism*, hoping that what remains would meet everybody's approval and be preferred to the status quo and the connected, incumbent litigation.

This applied at the group level but failed to do so for specific individual actors. From our analysis of the evaluation criteria brought up by the different actors, we could show that none of the two major options matches everybody's criteria, given the knowledge produced by the process. One of the two options is however more compliant than the other, and by far so, suggesting superiority in case there's no 'killer' criteria among the missed ones.

We could also show that criteria change over time and that, if we discard those criteria brought up by one group only, the likely superiority of the one solution increases as a function of the newly endorsed criteria. This implies that the likely superior arrangement became *more so* as a product of the RT process. We interpret this in the sense of a likely co-evolution between the knowledge gathered on the solution and the values determining its superiority. Given the new information, values first determined the superiority of one solution and then adjusted so as to strengthen it and thus produce convergence.

The same didn't happen for all actors individually, though. Two crucial ones eventually did not endorse the solution scoring the majority vote at the final meeting

of the RT and entering its recommendations. The rejection of the envisioned solution by these actors makes the recommendation impossible to implement, causing its substantial failure, despite the broad majority and the related political success.

Through the interviews, we found out that the position of certain actors cannot "move". This is caused, at least in part, by the inclusion dimension of the process design: few of the RT members can take decisions for their home institutions or significantly affect their position. The implication of this finding is that, in the absence of alternatives both passing the feasibility test and matching everybody's criteria, actors unable to move would automatically maintain the status quo and go for the litigation option if changes are made to the present arrangement. As they cannot change what they hold for important, the process can at best give them information on which to act strategically but cannot lead them to review their positions even if that turns out to be a dead end and lock them into the status quo.

Furthermore, politics emerged as an element of arbitrariness in the process, strongly conditioning the position of several central actors. The process has dealt with this mostly in centralised terms through the work of the Director of the RT. The very same inclusion concept of the RT, in line with the idea of getting to the science of things, involved high-rank technicians, who were bound to elected political representatives and did not hold a comparable mandate. Consistently with what observed above, this effectively limited the range of options of these representatives: they could choose how restrictively to interpret current laws, they had however no mandate to change things[66].

Eventually, the RT process came up with a solution encompassing a bundle of technical improvements of the current production system, the end of the underground disposal and a pipeline to the North Sea, where the salt can be discharged with negligible harm to the environment. The solution will not be implemented though, since both the company K+S and the State of Niedersachsen reject the construction of the pipeline and basically prefer a series of technical improvements, the

[66] See 5.2.3.3. and the corresponding detailed analyses in A4.1.2.3. and A4.1.3.4.

continuation of the underground disposal and a lower environmental standard for the Werra[67].

The missing agreement implies that the socio-ecological system substantially will not move towards the configuration envisioned by the RT. Instead, it is likely to maintain the status quo until the end of the current authorisations and then enter a litigation process. The litigation process will then finally be able to authoritatively re-distribute entitlements to a certain degree of surface and underground water quality and to establish a mandatory degree of abatement by K+S and adaptation by all others.

Summarising, our goal at the end of Chapter 1 was to find out by which means and processes actors communicate and interact so as to identify a rationale for the distribution of entitlements and obligations concerning the ecosystem of reference (RQ4). Given the above, our answer is that:

1) Actors in the Werra case focused on identifying the technical possibilities for a distribution of entitlements to environmental quality and obligations to abatement and adaptation. We detect here the *primacy of a technical discourse*.

2) They did not really discuss a different rationale for distribution in detail, and remained at the level of sustainability as environmental, social and economic compromise. We detect here the *avoidance of value-related issues*.

3) Since goals were not questioned and discussed, any likely output of the RT process equals to a mere redistribution of endowments and does not stand for a new, collectively defined way of running the socio-ecological system in the Werra/Weser watershed: what is important for everybody slightly converges around the pipeline option but fundamentally stays the same. We detect here a *resistance to collaboration*.

[67] This is explicit for K+S, implicit for Niedersachsen. Despite the claims, Niedersachsen hasn't shown yet that it is possible to achieve the current level of production (and profitability) with localized measures only. Until this is proven, the rejection of the pipeline solution implies either a lower level of production which does not rely on emissions into the Werra, or a lowering of the environmental objectives for the Werra. We can however dismiss the first of the two possibilities: since it leads, to present knowledge, to a lower or even nil production, it contradicts the goal of "a long-term solution for (…) the present production" (Statement Niedersachsen).

4) As the technical possibilities did not produce an alternative solution matching everybody's criteria, the abovementioned redistribution of endowments will be discussed in court, with the means and channels for interaction which are usual for that type of setting. We detect here the *primacy of the legal sphere*.

In the following we will review the empirical materials mentioned in Chapter 2 from each of these points of view.

7.1. Implications for the case studies and the overall research context

7.1.1. The primacy of a technical discourse

The primacy of a technical discourse has a rationale for the RT in the heated debates that took place at the Werra in the last two decades. Do we see value-free, technically driven approaches in the other case studies and in the related materials? Can we explain the success or failure of those cases in relation to the centrality they gave to technical aspects? Possibly.

Technical aspects certainly play a great role in defining the quality of decisions in almost all cases. The initial consultations introduced us to a tension between technically dominated, "value-free" approaches and more discursive ones, acknowledging certain degrees of freedom and thus leaving room for interpretation, compromise and the articulation of different interests. This resonates well with the process design of the RT, focusing on scientific evidence and objective feasibility as tools for restricting the range of options available.

The Krebsbach Dam case also adheres clearly to the model proposed by the RT. The difference here lies in the fact that the technical focus of the process was developed in isolation and modified incrementally rather than developed collectively. In comparison, the collective dimension of the technical developments taking place at

the RT has possibly paved the way to its broad endorsement, while the probably equally solid engineering behind the Krebsbach Dam case underwent major criticism.

The same can be said about the Sprotte case, where the strictly technical aspects were dealt with by a private bureau basically in isolation. We still don't have a collective development as in the RT. Instead we have an intense communication effort from the side of the decision makers towards the public and the participants of the different events. Participation is here explicitly meant as a tool for creating acceptance and not for structuring collective decisions. Decision makers had here a good standing and could leverage the trust they had in the eyes of the general public so as to express and articulate their interests. A similar approach would not have worked for the RT.

Technical aspects played a more nuanced role in the Panke case: while they represented the dominant level of communication on the Brandenburg side of the project, they constituted a mere control instance on the Berlin side. They surely encompassed the core of the discussions within the Steering Group, but they apparently did not play an equally dominant role in the participation workshops. Participants were given the possibility to express preferences and wishes and, by doing so, to affect the planning. Indeed, proposals underwent a subsequent technical check. This shows however that technicalities play a control role rather then a dominant one: here preferences were expressed first, and feasibility came after. Instead, at the RT feasibility comes across as a way not to enter a discussion on preferences.

The Watershed Connection case has a different relationship with technical issues. Here there is no actual, acute environmental problem to solve but rather an opportunity to seize – which may in turn create problems. Feasibility arguments therefore play no restricting role but rather an enabling one, as for the several feasibility studies behind the project. Of course, environmentalists have a different take on the matter. Due to the open structure of the Green Ring, constituting a forum "for the willing only", any debate on technical aspects is screened out and postponed to potential, later litigation phases.

Overall we see a certain tendency towards a technocratic approach to environmental problems, even within participatory settings. This is puzzling as it seems that the

social nature of environmental problems is acknowledged only partially. On the one hand, it is acknowledged that one must talk to people instead of diving into top-down engineering projects. On the other hand, one talks to people so as to talk engineering to them: explain the measures clearly enough and stakeholders will agree that what you think is good for them is indeed good for them. At this point we can only guess why this is so: possibly a poor understanding of social processes; more probably lack of time and resources.

This latter point is consistent with the tenets of the Leipzig Workshop. Credibly taking everybody's interest into account is indeed important (and costly), but that doesn't mean putting these differences into the focus of the collective discussions. Instead, a knowledge gap is stressed, and the fact that a structured process creates acceptance. Once all actors are at the table, focusing on the engineering and scientific aspects of the decision at hand perfectly fills these criteria and is expected to produce consensual outcomes.

From a GoverNat point of view, facing technically dominated processes and discourses can impair the possibilities of successfully adopting the analytical framework so as to describe the processes. Technical discourses do not make social circumstances irrelevant at all. The problem lies however in eliciting information from respondents and interviewees whose responses will come from within technically dominated narratives. If this is actually the case, the framework may perform worst where it is most needed: in processes that tend to underplay, consciously or not, the interpersonal dimension of the problem at hand.

The primacy of a technical discourse certainly represents an empirical challenge. However, it also constitutes a strong argument in support of the GoverNat framework from a conceptual point of view: the framework seems to point at dimensions currently neglected in the design of actual process but apparently crucial for their understanding – possibly also for their success, however defined.

7.1.2. The avoidance of value-related issues

The observed avoidance of value-related issues is directly connected to the search for objectivity at the RT. Interviews have stressed the arbitrariness and unpredictability introduced by politics in the RT process, in connection with the limited ability of most actors to “move” and reframe their positions. From the point of view of process design, the choice of restraining from value-related issues is thus consistent. What do the other empirical materials return on this issue? What does this imply in the broader research context of this work?

The interviews from the consultation round seem to take values for granted. the references to the interplay of interests between different actors (e.g. environmental agencies, commercial land users and developers, “threatened” residents, etc.) are plenty. The idea, though, of using participatory, discursive processes so as to redefine these interests is absent altogether. Instead, we find an idea of “defending” or “taking into account” interests that would be otherwise overlooked. At best, different interests are clear and clearly stated but certainly not worked upon.

The Krebsbach Dam is emblematic here: the conflict of interests is between parties with clearly stated interests. The actors leading process of re-engineering the piece of land left void by the dam are aware of the different interests already from the beginning. They take a specific stand when considering some and not others. The effect of the legal dispute during the authorisation process can be seen as a process of adjusting or correcting what is to be taken into account for such a project. If interests are known and they are not going to be discussed, involving the different actors ex ante and discussing the reasonability of their positions loses any rationale. The only crucial point representing a shortcoming in the process is the different assessment of the authorising agency on which interests to pick, which was picked up and integrated in the planning only ex post, possibly with additional costs.

The Sprotte case is similar in these respects: participation is present, but as a way of creating acceptance for an arrangement which was produced with very little explicit interaction. On the other hand, the planners here had an extensive prior experience in the area, which we could interpret as an informal process of taking up preferences over a period of time. An explicit re-discussion of the interests at play is still missing.

If positions do not fundamentally move because of the process, a design based on prior up-take and later clarification appears actually sound.

For the Panke case, a process of collective preference uptake did take place by the means of the participation workshops. Proposals were thus produced, which were subsequently scanned for conflicts and incompatibilities at technical level. However, participants were given the possibility to discuss these proposals in groups with the help of technical personnel already in the course of the workshops. This suggests that a certain degree of articulation did take place. We deal here with a one-off exercise, though, which possibly gave little room for individual preferences to be extracted from the specific proposals and made explicit. Surprisingly, settling incompatibilities through the technical assessments, as implicit in planning based on proposals, didn't trigger opposition. Our guess here is that stakes were possibly too low for conflicts to escalate.

The Watershed connection case is ambiguous on this matter, again due to its open and loose participation concept. The Green Ring offers indeed plenty of fora for settling different positions. Their consensus-oriented and willingness-oriented approach makes it however unlikely that in-depth debates ever take place within such fora. This appears even more unlikely if one considers that those parties involved in the Green Ring do not have to formally and/or explicitly agree on joint decisions. From this point of view, the Green Rings constitutes a platform for coordination-support, but certainly not a forum where conflicting interests are settled, producing shared arrangements and giving the socio-ecological system a truly collaborative dimension. Instead, and consistently with the previous subsection, acceptance is sought after at the Green Ring through technical arguments in the form of feasibility studies.

Finally, we have already stressed the static role of values and interests in the outcomes of the Leipzig Workshop concerning shared decisions. What is interesting here is that participation is seen in a twofold way: once for deciding together and once for creating acceptance. The two phases involve different individuals and groups and act at different degrees of specificity. The idea, then, that positions are *static and therefore not worth discussing* plays out differently in the two phases. At decisional level, technical arguments can still be used so as to explore the middle

ground: if there are, in other words, technical possibilities that make incompatible interests less so. At implementation level, in search for the acceptance of previously not involved parties, one accepts, instead, that opposition and frustration are unavoidable: technical arguments may still reduce them by the means of transparency, but only provided the suitable values are available among the stakeholders.

From a GoverNat point of view, the fact that processes do not lead to the articulation and re-discussion of positions and their underlying values makes it difficult to interpret the inclusion and closure dimension of the respective process designs. There are certainly formal requirements to the process that one can interpret as inclusion and/or closure, but it would be difficult to link the formal output of the process to its actual endorsement by the different participants. To an extent, it's the fate of the RT as well, where the distance between the formal almost-unanimity and the substantial failure of the process is striking and is, even after two years, only object of speculations.

7.1.3. Resistance to collaboration

The difficulty, – for some interviewees, the impossibility – of a change in paradigm in the way positions are articulated from underlying goals to specific choices resizes the possibilities of a learning experience to take place within a decision-making process, even if protracted over a long period of time as for the RT. We could go as far as to question whether the term collaborative governance applies at all.

What happens is the following. Actors gather a certain degree of information on one another. To the extent their respective positions depend on it, they may strategically review them accordingly without alterations of underlying values and objectives. Similarly, new technical or scientific knowledge may induce them to review their position on specific elements of given arrangements, provided they were not sought after per se but were functional to pre-ordered objectives.

At least for the RT, decision-making processes seem able to alter arrangements mainly at the level of substantial or strategic information. If this is the only difference

between situations before and after participation, and the output of participation is termed collaborative, we are forced to conclude that actors were collaborating even before the participatory process, albeit on the basis of different, possibly poorer information. This is absurd, in the sense that it would force us to adopt a pluralistic definition of collaboration which applies all the time, even to competition and open conflict. This isn't useful here.

The processes analysed here do not intend to alter and coordinate what actors are after and thus they don't re-organise ongoing arrangements on the basis of new, collectively found goals and objectives. If the RT is representative in that and does not represent just a special case, participation understood and implemented in these terms is not conducive to collaboration as we mean it above. What is more, interviewees consider this as a fact of life, implying that individuals in their position, in light of mandate and representation issues, *have to be resistant to collaborating with other participants*, at least if collaboration is intended as we mean it above. How does this insight resonate with the other materials?

The consultations and the Krebsbach case can be left aside on this issue as they have no collaborative dimension per se. The Sprotte shows instead an interesting set-up as it does foresee a forum for political representatives, the Mayors of the involved municipalities. The Mayors may indeed face political restrictions similar to the RT case and connected here to dynamics within and among their supporting political parties. Dealing with a rural area, we can however assume a strong degree of social control on the operation of the municipal administrations, so that Mayors represent a link between their own municipality's operations and the residents' preferences.

If we assume this bond to be stronger than the one to the respective political formations and to be a two-way kind of link, the forum set up for the mayors becomes capable of collaboration: theoretically, it is possible for Mayors to take up their constituencies' preferences, engage in discussions with the other Mayors, identify compatibilities and conflicts, work out common, collectively defined goals for a new arrangement at the Sprotte and communicate them. We can only speculate whether this actually took place or not, but from the point of view of process design it certainly represents an alternative to a technically focused, 'value-free' set-up as for the RT.

For the Panke case, collaboration certainly does not involve the participation workshops, due to their one-off character. We can however concentrate on the Steering Group. The Steering Group is made up by technical representatives only. In what they do, they are certainly restricted by the application of the law (given a certain interpretation) and by bureaucratic procedures. To the extent they have a certain room of option, collaboration becomes possible. This is true for RT Members holding technical posts as well. The difference here is maybe that the participants in the Steering Group hold much more homogeneous posts in comparison to those at the RT. Intuitively, this can give them a clearer view of how they can come towards each other and allow for a certain degree of "targeted" learning. This may be supported by mutuality and reciprocity within a clearly given but homogeneous frame.

The Watershed Connection Project seems to make a similar case. Top-level bureaucrats play the leading role within the project and the dedicated fora of the Green Ring. Such representatives have rather homogenous tasks and spheres of influence, so that collaboration as envisioned here can be buttressed by a certain degree of reciprocity. Furthermore, as the process tends to involve only "willing" actors, we may expect mutual reinforcement in the endorsement of specific measures and particular arrangements. Finally, in the absence of pressure towards formally and officially shared solutions, actors can work on producing shared visions and objectives over a rather long time horizon, as testified by the Watershed Connection Project itself, at large since more than a decade.

Finally, while the findings of the Leipzig Workshop have little to add on collaboration between different actors, a certain resistance to collaboration would have strong implications from a GoverNat point of view. Certainly, the inability or impossibility to produce collaboration has normative implications while evaluating processes: an actual process design intentionally fostering collaboration among participants can be tested for consistency against its own inclusion and closure variables. The question would then be, given the process's design and goals, whether these goals are within reach or not. Specific substantial goals for the process as a whole may require a redefinition of individual goals and objectives. As we see here, this may or may not be possible in light of the inclusion concept the process has adopted.

7.1.4. The primacy of the legal sphere

The distribution of entitlements and obligations making up the ex-ante arrangement for salt extraction and disposal in the Werra/Weser watershed was overtly unsatisfactory for all actors involved. Facing an unsatisfactory arrangement, these actors were held back from taking action and change it by the uncertainties of the legal battle that any such step would have triggered. Through the RT process, they had the chance to jointly review the state of things and come to a new arrangement, one which is ideally satisfactory for all.

Despite two years of discussions, it has not been possible to identify an arrangement matching everybody's criteria, nor did the very same criteria sufficiently change over time so as to make a similar arrangement possible. From a legal point of view, the status quo is not feasible any longer, so that actors now face a redistribution of entitlements and obligations, which will ultimately take place through the judiciary.

At this point in time, it is difficult to foresee how a court will adjudicate, even though the evidence produced by the RT with its recommendation will certainly be relevant. What is interesting for us is however that actors now enter a similar adjudication as a consequence of a failed deliberation process. Avoiding litigation was the reason that held them back for more than a decade – or else we would have to conclude that they were all better off with the status quo. Holding on to the idea that they were not better off with the status quo than with a court adjudication, the question is for us what to conclude now that we see them fail in the RT process and head towards a litigation case.

Certainly, the intention and what actually happened are two different things. We see nonetheless a process which appears deficient by design as an alternative to a court litigation and yet it is welcome and taken up extremely seriously by all parties involved as a way to solve the problem. The answer lies probably in the fact that a settlement in the court was pretty close to inevitable but the RT could offer a way to reduce the uncertainties surrounding it. Maybe, the RT is not to be seen as an alternative to a court settlement at all but as a 'lubricant', able to 'unlock' the problem and let it glide towards a solution, albeit through the judiciary instead of through collaboration as described above.

As a matter of fact, the RT did not rely on a fundamental change of positions as it probably did not consider it feasible. If this is the case, we were actually wrong stating that the process substantially failed. It was probably not meant to substantially achieve anything but rather prepare the participants for the litigation case ahead. In the impossibility of redistributing entitlements and obligations voluntarily, the court stood as the only forum able to produce a different arrangement.

What does this perspective tell us about the other cases? The threat of litigation and court cases certainly appears in the back of many aspects of the consultations. Certain references in the interviews are particularly explicit on this, such as the difficulty of operating (land) use changes and the often missing internal verification of administrative operations. The same goes for the difficulty of authoritatively achieving a good ecological status: however functionally effective, certain measures can be brought to court and can lose the case.

Litigation didn't play a central role in any of the other case studies. The Krebsbach case has seen an authoritative settlement, albeit still within the authorisation process. The outcome was not fully satisfactory, no alternative settlement mechanism was foreseen, though. Neither the Sprotte nor the Panke case have any major litigation aspects, and for the Watershed Connection Project, litigation is a present, but very remote threat. Also the insights brought back by the Leipzig Workshop focus on other aspects than litigation.

Finally, from a GoverNat point of view, a strong incidence of litigation threats requires data collection to put specific emphasis on the legal profile of the different cases. Particular attention shall be put on the grey areas of the arrangements at play: that is what courts may be asked to adjudicate on. Similarly, the interests of the actors at play and the available knowledge shall be reviewed in light of these grey areas, allowing for an assessment of the threat's likelihood and thus of the actors' willingness to enter a voluntary settlement through a participation process instead.

7.2. Overarching conclusions and outlook

The preceding section has put our core findings from the RT case into the frame of the broader research context of this work, establishing links with the consultations, with the other case studies, and with the outcomes of the Leipzig Workshop. This allows us to extract very careful generalisations from the overall materials we have gathered.

- First of all, we believe we witness a certain tendency towards technocratic approaches even when participation is involved. Each case offers a different rationale for that, but they all grant technical assessments a leading role.
- Secondarily, there is little or no sensitivity towards more nuanced articulations of the interests at play. The cases differ on that, but they all tend to leave comparatively little space for a thorough work on exploring common grounds.
- Thirdly, creating common grounds, collectively reviewing goals and objective so as to make a different arrangement possible, appears more or less off the agenda, even though some situations could have actually allowed that.
- Fourthly and finally, some cases must rely on top-down, authoritative interventions for entitlements and obligations to be redistributed. The cases show very little voluntariness on that.

We may be tempted to say that the we face a “light” interpretation of participation here. We can look back at our theoretical inquiry and reflect on the role social processes have for Vatn or Bromley. It seems to us that, for Ecological Economists, the “spirit” of participation *as a social process* is one of deciding together, beyond formal and legal constraints, collectively re-orienting and re-defining objectives so as to produce truly novel governance arrangements. This is what actually makes it desirable and worth the term “collaborative”. There is very little of that to be seen here, though. We have found that this is so for lots of different reasons, including good ones.

This leaves us with two considerations. On the one hand, participation is something new in all these cases: it may simply be a matter of time and possibly cultural development before the “spirit” of participation assumes the shape we understand it here. On the other hand, participation may mean and does actually mean something different in these cases: it means to produce new, more reliable information for smoother interaction, with no ambition to review anybody’s point of view.

It may well be that the ideal of participation, confronted with practical applications and real-life contexts, has assumed new and different characteristics and will further develop accordingly, regardless of the take Ecological Economists have on collaboration. For sure, future research will be needed so as to monitor any developments on this subject and adjust the positive understanding we have of participation.

Finally, our inquiry focused on the means and processes redistributing entitlements and obligations among interdependent actors in socio-ecological systems (RQ4). What can participation contribute to that, if understood and put to work in the way emerging from our analysis?

Our impression is that a participation of this kind can contribute to redistributing entitlements and obligations to the degree it is able to smoothen litigation cases and provide participants with appropriate knowledge and confidence so as to face them. With this type of participation, the act of redistributing entitlements and obligations among interdependent actors remains within the domain of courts and parliaments and will take place through the means and processes foreseen for them.

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Appendix 1 – Legal Framework

Sections: A1.1. The European Water Framework Directive; A1.2. The national legal framework; A1.3. Discussion and conclusions.

A1.1. The European Water Framework Directive

The European Water Framework Directive (2000/60/EEC, EuWFD in the following) is the cornerstone of today's water regulation in Europe. As a Framework Directive, it replaces and unifies prior European water regulations scattered across a plurality of directives[68]. The directive itself brings in a series of novelties for water authorities across the European Union. We can summarise them as follows:

- The introduction of the good ecological status;
- The prohibition of the worsening a river's state/status;
- The introduction of river basins districts as central administrative units;
- The economic analysis and the distinction between water uses and water services;
- The endorsement of the polluter-pays-principle, in particular concerning the requirement of full cost recovery for water services and the prohibition of sectoral cross-subsidisation;
- The concept of disproportionate costs;
- The "early, active involvement" of affected parties;

[68] The Drinking Water Abstraction Directive (75/440/EEC) and its Daughter Directives (77/ 795/EEC and 79/869/EEC); the Fish Directive (78/659/EEC); the Shellfish Directive (79/923/EEC); the Groundwater Directive on Dangerous Substances (80/68/EEC); the Discharge of Dangerous Substances Directive (76/464/EEC, later on codified as the Dangerous Substances Directive, 2006/11/EC).

- The drafting and timely reporting of Programmes of Measures and Management Plans.

The introduction of the good ecological status (§4(1), read: “Article 4, Paragraph 1”) constitutes possibly the most radical change: it moves the target of water management from achieving compliance to a closed list of chemical pollutants to achieving a certain quality of the habitats a watershed provides. The change scales up the complexity of the task from chemistry to at least biology if not ecology. The implications for the operations of a water authority are far-reaching, starting from the assessment methods thereby applied all the way to the catalogue of intervention measures an agency can rely on. It is safe to assume that time-frames and uncertainties generally increase due to the increase in complexity.

Given the assessment of a certain river’s state, the Directive foresees a timeline for its betterment (including delay and/or exception possibilities) and a general prohibition of its worsening (§4(1)). The latter provision strongly constrains the range of options for water managers. For example, policies distributing the burden of certain impacts across river basins would not be allowed. Even measures foreseeing a temporary worsening of a river’s status may be problematic. This latter case represents a grey area of regulation and its compatibility with the overall directive is yet not clear.

The introduction of River Basin Districts constitutes yet another major change in that it forces a geophysical and hydrological rationale for the definition of administrative boundaries. Political boundaries do seldom reflect surface-water hydrology, so that coordination systems become necessary. More precisely, coordination systems were always necessary, as ecological systems do not respect political boundaries either. The introduction of the River Basin Districts makes such coordination structures explicit.

The directive distinguishes water uses from water services and entails specific provisions accordingly. In particular, water uses constitute a broader category than water services. They encompass all activities, commercial or not, that affect or relate to water bodies. Water services, instead, foresee the channelling or accumulation of

water in specific structures “as an intermediary between the natural environment and the water use itself” (European Communities 2003, pg. 73). The Directive refers explicitly to: “abstraction, impoundment, storage, treatment and distribution of surface water or groundwater, along with wastewater collection and treatment facilities” (§2(38)). While activities such as fishery or water sports qualify as water uses, the provision of drinking water or the construction of irrigation systems constitute water services.

The distinction is important in that for the latter category cross-subsidisation is generally forbidden: this requires for example costs for water abstraction and distribution to be shared proportionally between irrigation and drinking water provision activities. Based on the provision of full cost recovery, water services are furthermore required to enact pricing mechanisms that match the monetary expenses connected with the activities at stake. Put this way, both provisions emerge as specific applications of the otherwise generally endorsed Polluter/User-Pays-Principle. This undergoes a specific transparency regime in that Member States are required to justify their choices on the basis, a. o., of an economic analysis (§5).

The concept of disproportionate costs (§4(5)) represents a controversial category. Trying to hypothetically reconstruct the policy-formulation process that has produced the Directive, it may represent an attempt to counterbalance the increase in complexity (hence efforts, hence costs) triggered by the introduction of the good ecological status. Put in very simplified terms, it introduces an exception regime based on the lack of alternatives below a certain cost-effectiveness threshold. In general, if achieving the good ecological status is more costly than what the involved parties can be expected to pay for, the environmental objectives for the area at stake may be lowered, while a compensation regime must be set-up.

The question lies in what the involved parties can be expected to pay. This category is left open by the Directive’s text, leading to different approaches across the EU (Görlach and Pielen 2007). Due to the specific timeline foreseen for its implementation, no established jurisprudence on the matter is available at the time we write (mid 2010). The literature, on its part, offers so far only interpretations based on specific cases and/or on deductive reasoning, e.g. referring to the impact of the monetary costs of particular measures upon the general “affordability/ability to pay”,

e.g. average administrative budgets, environmental budgets, sector-wide average margins and the like (e.g.: Klauer et al. 2007, Ammermüller et al. 2008).

The provision concerning the early, active involvement of all affected parties (§14) plays a similar role. The text “encourages” participation but leaves blank who is to be involved and how. As above, this has largely spurred interpretative and experimenting efforts on the side of theory and practice, respectively.

Lastly, the EuWFD obliges Member States to draft and publish Programmes of Measures (PoMs) and Management Plans (MPs) at least at the level of the River Basin Districts (§13, §15). Programmes of Measures consist of binding planning documents providing the details of how a certain Member State intends to achieve the good ecological status of a certain river basin. Management Plans instead entail the use regime of that specific river basin, basically laying down what activities can or cannot take place where and within which limits.

Putting this set of provisions into the Werra context, a few challenges emerge. Starting from the deadlines, Programmes of Measures and Management Plans for the Werra/Weser River Basin District are due by 2009, while the good ecological status is to be reached by 2015. Alternatively, if Germany cannot reach the set objective by 2015, it will have to show a path for its achievement by 2027. The salinity of the Werra is by no means negligible in terms of good ecological status, it has therefore to be accounted for within Programmes of Measures and Management Plans, either in the sense of providing the requisites for an exception or in the terms of identifying measures (Programme of Measures) and setting a salinity threshold (Management Plan) prospectively compatible with the good ecological status.

To put it plain and simple, the EuWFD forces the competent authorities to report on where they intend to draw the line concerning the salinity of the Werra. What is more, the directive binds them also concerning how they intend to draw that line. An economic analysis must be performed, justifying the choices made in the light of the connected financial flows and showing, to a certain degree, the respect of those provisions concerning non-subsidisation and the cost profile of the planned interventions.

The directive furthermore forbids the worsening of a river's status: solutions shifting the salinity away from the Werra into other water bodies would be, in principle, not allowed. Finally, the endorsement of the Polluter Pays Principle puts a further restriction on the distributive character of the arrangements chosen for the salinity question. In principle, it will not be possible to shift the costs of whatever chosen arrangement upon society: as a polluter, K+S will have to foot the bill.

A1.2. The national legal framework

The previous subsection has briefly portrayed the European Water Framework Directive both in general terms and for what concerns the decision at stake. A detailed exposition of the legal framework in which the Directive is to be integrated exceeds the possibilities and the aims of this work. We will therefore limit the scope of this subsection to those core provisions within which the decision is being taken.

In the following, we do not aim at presenting an exhaustive account from the point of view of legal studies. Instead, we intend to provide a general legal framework so as to make the discussion at the Round Table understandable for the average reader without specific legal expertise. It will be therefore sufficient to set as a criterion for relevance whether the given provisions were mentioned in the interviews or in the minutes.

This restriction allows us to limit the focus of our exposition to four pieces of regulation. The Water Household Act, the Environmental Impact Assessment Act, the Plan Designation Procedure (within the Administrative Procedure Act), and the Federal Act on Mining. All of them represents pieces of regulation at federal level within the German federal system.

A1.2.1. The Federal System

Germany's politico-administrative system encompasses three tiers: the federal government (*Bund*), the states (*Länder*) and the communes (*Kommunen*). Each of them has legislative powers allowing for the production of laws and an administrative apparatus for their execution. The Constitution (*Grundgesetz*, in the following "GG") regulates the relationship between the federal the state level concerning the production of laws (§30, §70). It distinguishes two mutually exclusive cases[69]: the production of laws on a specific topic can either represent an exclusive domain of the federal level (1) or have concurring regulation between the federal and the state level (2). The constitution foresees either of these types for a full list of topics (§74), while the court rulings adjudicate on possible grey areas between the two.

In the first case, the states cannot produce their law unless federal law allows them to. This is for example the case for foreign policy, telecommunication policy and national defence (§73). In the second case, states can either produce their own laws in the absence of federal regulations or integrate with state laws pre-ordered federal laws. Water and nature protection regulations fall within this latter typology (§74(29), §74(32)). For our case, regulations by the states extend a delegation chain that starts at the EU level with the introduction of the European Water Framework Directive, continues within the German legal system with the Water Household Act and ends with the Water Acts of the different states involved.

A1.2.2. The Water Household Act

The Water Household Act (*Wasserhaushaltsgesetz*, "WHG") regulates surface water, coastal waters and groundwater at federal level. In light of the federal/multi-level set-up, it has two main purposes: to transpose the Water Framework Directive into the German legal system (e.g.: §1a(1), §1b(1), §6, §§25a-25d, §36, §36b) and to set up a regime of delegations towards the states. While the WHG provides a framework, state law addresses more specific issues, such as the organisation of river basin districts (§36) or the drafting of management plans and programmes of measures (§36b).

[69] Previously three. One was recently dropped with the 2006 federalism reform.

The concept of a good ecological status is already substantially transposed by the WHG in the first article. Watersheds must be secured in their function of natural habitats (§1a(1)). The same article also states that the ownership of land does not extend to the water flowing through it (§1a(4)) and does not entitle to watershed uses. Instead, water uses are listed in §3 and require official authorisation in the form of either "permits" or "approvals" (*Erlaubnis* vs. *Bewilligung*, §7 vs. §8). Authorisations may be subject to conditionalities (*Auflagen*), requiring measures compensating for damages to the ecological or chemical status (§4(2) and §4(2.2a)). Similar measures can also be required ex post, provided that their cost is proportionate to their effectiveness (§5(1)).

Authorisations via permits and approvals must be applied for and are generally granted. The WHG provides however a list of criteria identifying cases where the authorisation must be refused (§6). For example, an application for a permit may be refused if the specific use at stake has detrimental effects over protected areas that are not adequately compensated (§6(2)). Permits and approvals have a similar domain of application (compare §7(1) with §8(1)). Most provisions within the WHG apply to both alike. They foresee however different administrative procedures. Most relevant for the Werra case is that permits directly foresee an environmental impact assessment (§7(1)), while approvals do so only if they are applied for within a process that requires it (§9).

The choice between the two instruments is seemingly discretionary, allowing for closer regulation at state level. This happens via concurring regulation between federation and states as foreseen by the federal setup. As a matter of fact, permits constitute the relevant instrument for the Werra case. This is so because approvals are actually seldom and may disappear in future environmental regulations[70]. Even more important is however that water discharges (as for the Werra) are the only topic the WHG explicitly foresees permits for (§7a(1)). An environmental impact assessment is therefore mandatory for the Werra case.

The reference to the environmental impact assessment sets the stage for the administrative procedure concerning discharges into the Werra/Weser watershed to

[70] The proposed Environmental Framework Act (*Umweltgesetzbuch*) integrating and replacing the different environmental laws of the federal legal system did not foresee this distinction. The introduction of the Environmental Framework Act in 2009 failed however, leaving environmental law as it currently is, fragmented across different pieces of regulation.

be detailed out. The specifics of the procedure are regulated by the Act on Environmental Impact Assessment and will be presented further in the text. On this point, the WHG merely stresses that Watersheds have to be managed for the common good (*Wohl der Allgemeinheit*), in such a way that the achievement of a good ecological status is not undermined (§25a(1)). The common good as a reference point implies that watersheds are not granted the strictest protection. Instead, activities having detrimental effects can be authorised if the stream of benefits derived from them fulfils two conditions: 1) the good ecological status is not undermined and 2) the resulting stream of benefits surpasses the costs of abatement/compensatory measures from the point of view of society as a whole (§6(1))[71].

Detrimental effects in the Werra case come from both direct and indirect discharges of salt into the watershed. Salt represents waste from an extracting activity. We deal specifically with the discharge of wastewaters into the environment. Within the German legal system, waste is dealt with in the Closed Substance Cycle Waste Management Act (*Kreislaufwirtschafts- und Abfallgesetz*, "KrW-/AbfG"). The same act states however that waste is a matter of water law as soon as it enters in contact with a water body (§2(2.6) KrW-/AbfG). This provision anchors wastewaters in the WHG. As shown above, authorisation processes under the WHG foresee the respect of the two principles mentioned in the previous paragraph and generally require an environmental impact assessment.

The WHG provides details of the competences regarding the authorisation process (§14). An authorising agency is foreseen (§14(1)), issuing the permit in agreement with the competent water authority (§14(3)). The WHG text does not specify which pre-existing or ad-hoc constituted office represents a competent authorising agency. In the light of the competing regulation by federal and state law, this vacuum allows for later regulation, possibly by the states themselves. When however the permit at stake is connected with extracting activities, the WHG text specifies that the competent authorising agency is the mining authority (§14(2)). Mining authorities have procedures of their own for issuing permits. Before we turn to them, we need to introduce the general regulations on authorisation procedures and on environmental impact assessments.

[71] Please note that the reference to compensatory measures implicitly allows for the worsening of a watershed's environmental quality.

A1.2.3. The Plan Designation Procedure

The plan designation procedure (*Planfeststellungsverfahren*) is a procedure regulated by the Administrative Procedure Act (*Verwaltungsverfahrengesetz*, "VwVfG", §72 to §78). It foresees a series of steps that a general administration body has to follow whenever fulfilling administrative tasks. The procedure herewith has the aim of guaranteeing adequate transparency to administrative acts. It for example foresees that, whenever an administrative act foresees a plan designation procedure, this act must be made public via notice on local newspapers (§72).

The VwVfG text takes for granted that an authorising agency is clearly identified. It therefore leaves a legal vacuum concerning the identification of the specific agency. Exactly as we have seen for the WHG, this legal vacuum can be filled by other laws, while the VwVfG focuses on the plan designation procedure only. Within it, the authorising agency acts upon the presentation of a plan by a proponent and organises a hearing within 4 weeks from the presentation onwards. It forwards the plan documentation to the territorially affected municipalities for exhibition. It's the municipalities' duty to make the plan publicly accessible (§73(5)).

From the moment the plans are on exhibit (*Auslegung*), there is a legal time for the submission of statements (*Stellungnahmen*) by concerned citizens. In the meantime, the authorising agency also collects statements from technically competent administration offices (§73(2) and §73(3)). This procedure represents the public hearing and may or may not include public events according to the number of known affected parties.

The VwVfG generally grants to affected parties the right to a hearing (§28) whenever an administrative act encroaches on their rights. Accordingly, it foresees the obligation for acting administrations to provide the possibility for statements to be submitted (§66). The consideration of objections raised towards the approval remains discretionary (§74(2)). This does not affect the possibility for affected parties to challenge the authorisation process on formal grounds (§74(1)) via the administrative court (§70). While authorising the plan, the agency has to impose additional

measures for the protection of the common good or so as to minimise damages to third parties, if necessary. A compensation in money is foreseen if prevention is not possible.

A1.2.4. The Act on Environmental Impact Assessments

The plan designation procedure described above has general application and represents the background against which an environmental impact assessment takes place. Together with strategic environmental assessments, environmental impact assessments are regulated by the Act on Environmental Impact Assessments (*Gesetz über die Umweltverträglichkeitsprüfung*, "UVPG"). The UVPG text entails a procedure documenting and verifying the effects of plans and programmes on a series of protected objects (*Schutzgüter*, §2(1)). Finally, it transposes the Directive on Environmental Impact Assessment (97/11/EC) into the German legal system.

In the UVPG text, environmental impact assessments and strategic environmental assessment represent two distinct procedures. Similarly to the plan designation procedure, both procedures are to be seen as part of pre-ordered administrative processes, such as the granting of permits, approvals and the like. Thus, the UVPG text does not identify a specific responsibility by one specified, pre-existing or ad-hoc constituted agency for environmental impact assessments and/or strategic impact assessments to take action in a set of circumstances so as to ensure the application of the UVPG. Instead, the procedures laid out here apply to whatever agency is in the process of granting a permit or an approval (§3a). The given agency has to refer to the provisions laid out in the UVPG text so as to verify whether its provisions apply and what they entail for the particular activity being considered for authorisation, unless pre-ordered regulations explicitly say otherwise.

The domain of application of UVPG is primarily defined via the reference to two lists of activities: Appendix 1 for the environmental impact assessment and Appendix 3 for the strategic impact assessment. More specifically, Annex 1 provides a list of activities subject to environmental impact assessment. For each entry of the list, Annex 1 further distinguishes whether an environmental impact assessment applies

straight away, whether it has to be decided for the general case, whether it has to be decided for the specific case or whether thresholds are set by state regulation. Each of these types are regulated by specific articles of UVPG. Annex 3 identifies instead a series of administrative acts for which a strategic impact assessment is foreseen. Furthermore, UVPG also defines its own domain secondarily, via a series of protected objects potentially being affected by those plans and programmes under scrutiny (§2(1)).

Once the question is cleared, whether the UVPG applies or not, the Act ensures that specific steps are taken by the involved agency in the process of granting an authorisation. Those steps represent minimal obligations, in the sense that state or concurring federal laws can foresee tighter and more encompassing duties for both environmental impact assessments (§4) and strategic environmental assessments (§14e). Those steps involve a full list of information requirements for both disclosure and for consideration in the authorisation process, a regime of cooperation with technically and territorially overlapping agencies, a specific communication policy and, finally, a general rationale for decision for or against the plan or programme.

The UVPG text requires a review of the significant adverse effects the plan or programme is expected to have on the environment, a review of the measures aimed at avoiding, reducing or compensating them ("*…vermieden, vermindert, …ausgeglichen…*"), a review of the alternatives considered and of the process that has identified the specific measures chosen. Here lies the core procedural difference between the environmental impact assessment and the strategic impact assessment. In the first case, the above information is part of the documentation submitted by the proponent of the plan or programme, applying for authorisation (§6(3)). In the second case, they are object of an environmental report (*Umweltbericht*) drafted by the authorising agency (§14f, §14g).

In the UVPG text, the choice between an environmental impact assessment and a strategic environmental assessment takes the latter for a special case. In other words, within the domain of UVPG, the environmental impact assessment is the general case. The strategic environmental assessment applies, then, if the plan or programme under scrutiny either figures in Annex 3 or is related to an activity thereby listed (§14b). Furthermore, nature protection regulations can explicitly require a strategic environmental assessment (§14c). Finally, states regulate whether the

strategic environmental assessments are mandatory on particular water-related cases (14d(2)).

As described above, the UVPG text does not foresee dedicated bodies. It rather entails a procedure generally applicable by authorising agencies identified by other means. It is therefore not granted that the authorising agency at play has the technical expertise to judge the matter. The UVPG text contains provisions for this circumstance. First, a point of reference is set: agencies are to refer to the current state of the art in terms of knowledge and technical assessment methods, as entailed by §6(3) for the environmental impact assessment and by §14f(2) for the strategic environmental assessment. Other technically competent administration agencies may be consulted (§7; §14h) so as to close specific knowledge gaps.

The UVPG text also foresees a regime of public participation. It makes thereby full reference to what foreseen for the plan designation procedure (specifically: §73 to §74 VwVfG) and adds the information mentioned above to what must be publicly available due to the Environmental Information Act (see §9(1a), §9(1b)). Furthermore, the public must be given the possibility to submit statements (*Gelegenheit zur Äußerung*, §9(3.3)), again with full reference to the plan designation procedure (§74 VwVfG). In case the plan or programme involves more states, the states nominate a leading one among them ("…*federführend*…"), which undertakes these duties (§14).

Finally, from a substantial point of view, the actual decision authorising the plan or programme under scrutiny (*Planfeststellungsbeschluss*) may only be granted if it can be ensured that the common good is not threatened (*Wohl der Allgemeinheit nicht beeinträchtigt*) (§21). This means: it must be certified that the protected objects mentioned in §2 are not threatened and that precaution has been taken towards them. The ex-ante state of the environment is thus granted protection. Those activities foreseen within plans and programmes must take place within it, avoiding significant environmental effects. As this is seldom possible, they must either remediate or compensate for the changes they produce, taking the common good for a benchmark.

As we see, UVPG aims at ensuring authorisation processes with a clear precautionary approach. Extraction activities and the effects thereof have however an

exception status within the abovementioned water regulations, as mining regulations come into play (§14(2) WHG). Above, we have sketched the treatment that the combined VwVfG and UVPG would normally grant to environmentally significant authorisation processes. We now turn to the Federal Act on Mining so as to appreciate its implications against the background of VwVfG/UVPG authorisation processes.

A1.2.5. The Federal Act on Mining

The purpose of the Federal Act on Mining (*Bundesberggesetz*, "BBergG") is to regulate access to mining resources, so as to ensure 1) the provision of raw materials, 2) the safety of the companies and 3) that precautions are taken towards damages to third parties (§1). Its approach is therefore opposite to the regulations portrayed so far: BBergG aims at ensuring that a given activity (mining) *does* take place. In other words, setting the boundary between the state of the environment and the extent to which a certain economic activity can take place, all regulations mentioned so far (WHG, UVPG, VwVfG) intend to make sure that the specificities of the environment are adequately considered. BBergG, instead, is there to make sure that the specificities of mining are adequately considered.

The environmental relevance of BBergG emerges implicitly through those provisions that either refer to UVPG or to VwVfG or that clearly indicate terms of reference for setting checks and balances to mining activities. Similar provisions appear in two distinct aspects of the BBergG text: the authorisation procedure and the permission given to an operation plan (*Betriebsplan*). It is noteworthy that both constitute procedural requirements. Thus, the BBergG text does not encompass substantial prescriptions concerning the environmental consequences of mining activities. While the WHG text for example encompasses detailed references to the good ecological status to be achieved, BBergG foresees procedural steps where environmental considerations can enter via the reference to further regulations.

On the authorisation side, the background of the administrative procedure is that the Federal Act on Mining (BBergG) approaches the access to underground resources in the same way the Water Household Act (WHG) approaches water uses. Ownership

overlaps with landownership only in part, while both searching for and extracting underground resources is subject to authorisation via the obtainment of an approval (*Bewilligung*) and of a permit (*Erlaubnis*), respectively (§7; §8). An application (*Antrag*) is required (§10) for both. Applications are generally granted and can be refused on the basis of criteria listed in §11, §12 and §13. Specifically, these articles describe a series of circumstances that require the authorisation to be refused. Those administrative procedures for the issuing of permits and approvals are generally regulated with reference to the plan designation procedure (§73 to §78 VwVfG) portrayed above. The BBergG text regulates however specific aspects explicitly.

The competent agency issuing the permits/approvals is required to provide other affected agencies the possibility to give a statement (§15). In this, BBergG duplicates a provision which would apply anyway via the reference to the plan designation procedure. There is however a different formulation identifying the affected agencies: affected agencies are those whose task is to pursue the public interest as in §11(10), the provision denying approvals for matters of overriding public interest. This formulation identifies a broader set of agencies than the technically competent ones the plan designation procedure (§73(2) and §73(3) VwVfG) would otherwise foresee. At the same time, the formulation is subject to a broader range of interpretations.

Authorisations can be subject to conditionalities, also ex-post (§16(3)). Conditionalities represent additional measures targeting those circumstances that would otherwise lead to an authorisation refusal as of §11, §12 and §13. The set of additional measures such conditionalities can impose on the extracting company is however restricted to those measures that are economically viable for the mining company, within the generally accepted technical standards. Here we have further two important dimensions for setting the boundary between what extracting companies may or may not be asked to take care of within their activities: economic viability an technical standards. The same dimension come into play for the permission (*Zulassung*) of the operation plan (*Betriebsplan*), constituting the second interface between extraction and environmental aspects in the BBergG text. En passant, this explains the focus of the RT on technical issues.

By detailing out the requirements for an operation plan (§48 and §50 to §57c), the BBergG text regulates rather closely the management of both the search for

underground resources and the management of the extraction activity to be set up. Most prescriptions deal with safety issues (e.g.: §55(2), §55(3), §55(5), §66(8), §55(9), §55(10), §55(11)). Some take however the broader public interest as a point of reference (e.g.: §55(4), §55(6), §55(7)). In particular, §55(6) requires that the plan is approved only if it shows that waste will be appropriately disposed of. As for the authorisation process, conditionalities can be laid upon the permission, also ex post. This may happen, though, only if economically viable and within generally accepted technical standards (§56). Here is why entitlements and obligations in the Werra case belong to a grey area of regulation, with particular reference to time and technical standards.

The Act may also require that operation plans are approved only after an environmental impact assessment or a plan designation procedure has been performed (§52(2a)). The definition of the terms under which those procedures are mandatory is delegated to the Ministry of the Economy and Technology, in cooperation with the Ministry of the Environment, both at federal level (§57c). The terms of the impact assessment are instead defined by the agency issuing the permission, in cooperation with the extracting company and with other technically competent agencies. The operation plan must encompass all information relevant for an environmental impact assessment. In particular, it must provide a reasonable description of the expected significant effects on the environment under current knowledge as well as a reasonable description of those measures intended for minimising, avoiding, compensating, replacing them (§57a(2)). Precaution in environmental concerns is thereby understood in terms of public interest as of §48 (§52(2a)).

Given the above, extraction activities should hardly differ from other plans and programmes in terms of the procedure authorising them and balancing their importance against their impact upon the environment. An environmental impact assessment with a minimal degree of information disclosure and a regime of cooperation with competing authorities is ensured by the reference to the plan designation procedure and to the UVPG. The text states however, that a decision concerning authorisation has to be taken according to the criteria foreseen by BBergG (§57a(4)). This is explicitly so concerning the relationship between affected parties, the extracting company, and the protection of third party interests. Even

though the decision must take into account a summary of the environmental consequences (§57a(4)), and even though BBergG does not overrule those regulations that forbid specific activities for matters of overriding public interest (§48(2)), care should be taken that search and exploitation of mining resources are affected as little as possible.

A1.3. Discussion and conclusions

Having portrayed the core regulations characterising the Werra case, we can now get one step closer to the discussion taking place at the Round Table. We do so by exploring the role of the aforementioned regulations in shaping the choice between how much extraction and how much environmental protection the actors at play should be entitled to/burdened with. BBergG and WHG seem to provide different pictures: WHG makes reference to the common good as a core objective for authorising processes, while BBergG grants a priority to extraction: matters of overriding public interest can at best constitute a second-order restriction. The two formulations may give room to diverging interpretations and hence lead to different distributions of entitlements.

Furthermore, WHG has an explicit goal concerning the quality of the environment. As a transposition into German Law of the European Water Framework Directive, it aims at the achievement of a good ecological status and forbids any worsening in ecological quality. BBergG instead foresees requirements for extracting companies only within reason, with reference to the current technical knowledge and only if economically viable. Situations can therefore be imagined, where current technical knowledge is not sufficient for avoiding or compensating environmental damages in an economically viable way for the extracting company. In similar situations, the extracting activity shall be allowed, unless reference is made to overriding public interests not to authorise it.

Is there a problem emerging from this different treatment of the same authorisation under WHG and under BBergG? Yes, though it’s an indirect one. The correct identification of the norm to apply is rather straightforward: 1) the operations of K+S

on the Werra constitute extraction activities which in turn require the production of salt-rich wastewaters; 2) since those wastewaters get in contact with a watershed, the Closed Substance Cycle Waste Management Act (KrW-/AbfG) refers to the Water Household Act (WHG); 3) on its part, WHG refers to the Federal Act on Mining (BBergG), since the wastewaters come from an extraction activity. BBergG is the rule to apply.

Little ambiguity can emerge. The problem comes in terms of compatibility with the European Water Framework Directive, of which WHG is the main transposition into the German legal system. The German legal system may recognise mining as a priority, hence allowing WHG to leave way to BBergG. That, however, does not exempt the European Member State Germany from its obligations towards the European Union. Such obligations are fulfilled only to the extent that BBergG produces the same arrangements WHG (the transposition of the EuWFD) would achieve. This may or may not be the case, as we have shown above.

Seeing this as a problem of interpretation, the legal scholar would now turn to the available jurisprudence for precedent cases and prior rulings in search for the "correct" interpretation. This correct interpretation must be able to unambiguously define: 1) what is the current knowledge on abatement/remediation possibilities; 2) what is the current knowledge on the effects of K+S's activities on the watershed; 3) what it is economically reasonable to require from K+S; 4) whether the good ecological status is thereby achieved or not; 5) whether disproportionate costs would arise; 6) whether overriding public interests would justify a refusal of the current authorisation regime.

Legal aspects are of interest for us only in the broader frame of the decision process at stake. Therefore, instead of turning to prior rulings, we need to turn to the discussion at the Round Table and investigate how participants get a hold on the interpretation of the key dimensions highlighted above.

Appendix 2 – Analysis of the statements[72]

Sections: A2.1. The European Water Framework Directive; A2.2. The salinity thresholds; A2.3. Overall watershed quality; A2.4. The balance between economy and ecology.

In Chapter 5, Table 5.3 enlisted more than 40 topics constituting the arguments put forward by the RT Members. Matters of space and capacity prevent us from addressing all of them. We will thus concentrate on those arguments above the 90th percentile, the ones most frequently referred to in the statements. They are: 1) the European Water Framework Directive, 2) the allowed salinity thresholds, 3) the overall watershed quality and 4) the balance between economy and ecology (together with the employment issue)[73]. The following sections address these topics individually.

A2.1. The European Water Framework Directive

Concerning the European Water Framework Directive (EuWFD), two main interpretations seem to emerge: the entitlement to a good ecological status and the time pressure connected to meeting the Directive's deadlines. A possible, alternative interpretation, seeing the EuWFD as a way of structuring collective decisions over the Werra-Weser watershed, (e.g. whether to invest in its betterment or accept a lower environmental standard) does not emerge from the statements, nor does the idea that the good ecological status may or may not apply in full. In support of the

[72] Please note: this Appendix was originally part of Chapter 5 and has later been taken out for matters of space and readability. For information on methodological aspects and for a summary of the insights, please refer to Chapter 5, Sections 5.2.1.1. and 5.2.1.3. respectively.

[73] For the sake of precision, we have to report that the injection practice is mentioned almost as often as the balance between economy and ecology. It is however mostly mentioned as a general demand to stop that specific practice, without a detailed articulation. We therefore leave it aside and concentrate on those topic which are generally dealt with in greater detail within the statements.

"entitling" use of the EuWFD argument, the following quotes are enlightening (note the use they make of the concepts of "requirement" and "obligation"[74]):

> "As the EuWFD requires a good ecological status for all water watersheds, this applies to Werra and Weser as well. The process of achieving this goal (…) is now a task for the RT" (Municipality of Gerstungen)[75].

> "The above presentation leads almost directly to a series of requests for the achievement of the goals of the EuWFD. (…) Overall, we consider the suggestions hereby reported appropriate for (…) meeting the requirements of the EuWFD in full scale" (Env. NGO Hessen)[76].

> "Goal for the Environmental NGOs of Niedersachsen is to achieve a good ecological status for Werra and Weser as entailed by the EuWFD. The Federal Republic of Germany is obliged to do so in the process of implementing the EuWFD" (Env. NGO Niedersachsen)[77]

> "The EuWFD requires a good ecological status for all watersheds by 2015. Obviously that must apply to Weser, Werra and Fulda as well" (Env. NGO Thuringia)[78].

The last quote also introduces the element of time. In the following quotes, please note the use of the terms "by" and "deadline"[79]:

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[74] In German: "*Fordern/Forderung*" and "*Pflicht*".
[75] Original text: *"Da die EU-Wasserrahmenrichtlinie bis zum Jahr 2015 einen guten Zustand für alle Gewässer fordert, gilt dieses auch für Werra und Weser. Vorgehensweise und Werdegang zur Erreichung dieses Zieles (...) ist nun Aufgabe des Runden Tisches"*.
[76] Original Text: *"Fast ergibt sich aus der eben aufgezeigten Aufstellung im weitesten Sinn schon ein Forderungskatalog für die Erreichung der Ziele der EU-Wasserrahmenrichtlinie. (...) Die hiermit eingebrachten Vorschläge werden als geeignet angesehen, (...) der EU-Wasserrahmenrichtlinie in vollem Umfange Rechnung zu tragen"*.
[77] Original Text: *"Die Umweltverbände Niedersachsens streben einen guten ökologischen Zustand von Werra und Weser im Sinne der Europaeischen Wasserrahmenrichtlinie (WRRL) an. […] Dazu ist die Bundesrepublik Deutschland im Rahmen der Umsetzung der WRRL verpflichtet"*.
[78] Original Text: *"Die EU-Wasserrahmenrichtlinie fordert bis zum Jahr 2015 einen guten Zustand für alle Gewässer. Das muss selbstverständlich auch für Weser, Werra und Fulda gelten"*.

"The EuWFD must be implemented by 2015, so as to allow the Werra to return to an almost natural watershed by 2020" (State of Bremen)[80].

"In order to fulfil the requirements of the EuWFD a binding concept for the sustained reduction of the salt-rich wastewater emissions is necessary, so as to restore freshwater habitat conditions *within the deadlines* prescribed by the EuWFD" (Fishery Association Niedersachsen – emphasis added)[81].

"The planning document about to be drafted, concerning measures and their timing, should conform to the prescription of stepwise developing almost natural conditions for the watershed by 2020 (…)" (District of Göttingen)[82].

"As time presses due to a plurality of reasons – ecological aspects, drinking water quality, tourism (and also because of legal matters) – the self-appointed goal of producing results in about 18 months absolutely has to be achieved. Results must afterwards be quickly presented to the authorities for a quick implementation" (Municipality of Gerstungen)[83].

The last quote suggests that the necessity to comply with the time dimension of the EuWFD, keeping up with its deadlines, may have an instrumental value: a dimension of urgency seems to be present as well in the way the RT Members approach the question of time. Under a similar interpretation, the deadlines have to be met not

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[79] In German: "bis" und "Frist".
[80] Original Text: *"Die europäische Wasserrahmenrichtlinie muss bis 2015 umgesetzt werden, um darüber hinaus die Werra ab dem Jahr 2020 wieder zu einem naturnahen Gewässer werden zu lassen"*.
[81] Original Text: *"Zur Erfüllung der Vorgaben der EG-Wasserrahmenrichtlinie (WRRL) ist ein verbindliches Konzept zur nachhaltigen Reduzierung der Salzabwassereinleitung erforderlich, um im Rahmen der in der WRRL genannten Fristen die Wiederherstellung limnischer Lebensbedingungen in Werra und Weser zu erreichen"*.
[82] Original Text: *"Der zu entwickelnde Maßnahmen- und Zeitplan sollte unter der Maßgabe erfolgen, dass die Werra und Weser schrittweise bis zum Jahr 2020 zu naturnahen Gewässern entwickelt werden (...)"*.
[83] Original text: *"Da die Zeit wegen einer Vielzahl von Gründen mehr als drängt – ökologische Aspekte, Trinkwasserqualität, Tourismus etc.(und auch wegen rechtlicher Gesichtspunkte) – ist das selbst auferlegte Ziel, der einvernehmlichen Ergebnisfindung in ungefähr 18 Monaten, auch unbedingt einzuhalten, um danach das erarbeitete Resultat den genehmigenden Behörden zur schnellen Umsetzung vorzuschlagen"*.

because it is imperative to respect them, but because they connect to a urgent problem. We couldn't however retrieve specific indications on the sources of such urgency. For example, urgency due to matters of irreversibility could not be detected in the text, at least not explicitly.

A2.2. The salinity thresholds

In the narrative emerging from the different statements, the achievement of a good ecological status has a direct and obvious connection to the salinity thresholds allowed in the Werra (*"Grenzwerte"*). A lowering of those thresholds is first of all referred to in legal terms, in the light of the pending renewal of the emission permits. This is best captured by quotes such as the following:

> "The permit determining the salinity thresholds for (…) total chloride expires in 2012. An actual lowering of the thresholds (…) should take place the latest by then" (District of Göttingen)[84].

> "(The Weser River Basin District) has furthermore decided, that (…) the current chloride thresholds (…) of up to 2.500 mg/l chloride (daily average) is to be lowered after November 2012 the latest" (State of Niedersachsen)[85].

Other statements make an explicit mention of the link between a good ecological status as required by the EuWFD and lower salinity thresholds:

> "In order to reach a good ecological conditions, the chloride thresholds has to be lowered below 200 ml/l" (Federal Government)[86].

[84] Original text: *"Die Genehmigung des Grenzwertes (...) läuft für das Gesamtchlorid 2012 (aus). Spätestens ab dann sollte die konkrete Absenkung der Grenzwerte (...) erfolgen"*.
[85] Original text: *"(Die FGG Weser) hat weiter beschlossen, dass (...) die heutigen Chloridkonzentrationen (...) von bis zu 2500 mg/l Chlorid (Tagesmittel) spätestens nach dem November 2012 zu reduzieren sind"*.

> "100 mg chloride/l (LAWA) and 250 mg chloride/l at 25º dH (Drinking Water Act) should be set as a guideline value to be reached for a good ecological status" (Env. NGO Niedersachsen)[87].

While other excerpts refer to the biological effects connected to a salinity threshold, more articulated statements stress the link with socio-economic dimensions. Compare the first two and the second two of the following excerpts:

> "(Concerning) the reduction of the chloride emissions from 2012 (…), the concentration has to be lowered to 400 mg, so that plants, fishes and other species within the fish food chain can thrive (…)" (Fishery Association Hessen-Thuringia)[88].

> "For the protection of the watershed habitat Werra and Weser and their fish stock, we plead to oppose an increase of the salt emission and to lower the current thresholds as soon as possible to a level compatible with fish life" (Fishery Association Niedersachsen)[89].

> "(We demand the lowering of the threshold (…) aimed at the achievement of a good ecological status as required by the EuWFD (…) The permit granting the abovementioned threshold (…) of 2.500 mg/l chloride until 2012 (…) has to be verified in legal terms. The height of the threshold has to be set exclusively on the

[86] Original text: "*Zur Erreichung des guten ökologischen Zustands müsste der Chlorid–Grenzwert unter 200 ml/l abgesenkt werden*".
[87] Original text: *"100mg Chlorid/l für einen guten ökologischen Zustand (LAWA) sowie 250 mg Chlorig/l bei 25 Grad deutsche Härte (Trinkwasserverordnung) sollten als zu erreichende Richtwerte festgelegt werden"*.
[88] Original text: *"(Bezüglich der) Verringerung der Chlorideinträge ab dem Jahr 2012 (...) muss die Konzentration auf 400 mg gesenkt werden, damit eine Besiedlung durch Pflanzen, Fische und Fischnährtiere erfolgen kann (...)"*.
[89] Original text: *"Wir fordern, zum Schutz der Fließgewässerlebensräume Werra und Weser und ihrer Fischbestände eine Erhöhung der Salzfracht zu verhindern und die bestehenden Grenzwerte schnellstmöglich auf ein fischverträgliches Maß zu senken"*.

basis of independent analyses of the effects of the disturbance on the watersheds' biotic communities" (Env. NGO Thuringia)[90].

"Riparian dwellers of Werra and Weser, environmental NGOs and civil society groups demand a lower salinity threshold after 2012 than the 2.500 mg/l granted by the current permit until 2012. (…) The company K+S has communicated in October 2006 that it is currently not possible to reduce the 2.500 threshold without threatening the potash production at the Werra. The discussion on the thresholds is therefore suitable so as to decide whether the potash factories should remain at the Werra. For this reason we look at the initiative of lowering the thresholds with great concern, because most of its supporters have no stakes in terms of employment" (District Hersfeld-Rotenburg)[91].

A2.3. Overall watershed quality

Under the header of the overall watershed quality, we scanned the statements for indications and value judgements on the state of the Werra-Weser river basin. Most statements present a dynamic element in these respects, as they either introduce a historical or a causal perspective. For example, we learn that:

[90] Original text: *"(Wir fordern die) Absenkung der Grenzwerte (...) zur Erreichung des guten ökologischen Zustandes im Sinne der WRRL […] Die Genehmigung des angeführten Grenzwertes (...) in Höhe von 2.500 mg/l Chlorid bis 2012 (...) ist rechtlich zu überprüfen. Die Höhe der Grenzwerte soll ausschließlich auf der Basis unabhängiger Untersuchungen zur Auswirkung der Beeinträchtigung auf Lebensgemeinschaften der Fließgewässer ausgerichtet sein".*

[91] Original text: *"Es wird von Werra/Weser-Anliegern, Umweltverbänden und Bürgerinitiativen gefordert, dass der mit der derzeit erteilten Einleitungsgenehmigung bis zum Jahr 2012 genehmigte Grenzwert von 2.500 mg/l nach dem Jahr 2012 gesenkt wird. […] Das Unternehmen K+S Kali GmbH hat in einer Information im Oktober 2006 darauf hingewiesen, dass eine weitere Reduzierung des Grenzwertes von 2.500 mg/l ohne eine Gefährdung der Kaliproduktion an der Werra derzeit nicht möglich ist. Damit ist die Grenzwertdiskussion auch dazu geeignet, grundsätzlich über den Bestand der Kaliwerke an der Werra zu entscheiden. Aus diesem Grunde betrachten wir die Initiative zur Senkung der Einleitungsgrenzwerte mit großer Sorge, da bei den meisten Unterstützern eine Betroffenheit bezüglich der Arbeitsplätze nicht vorliegt".*

> "The increased salinity due to the potash industry in Thuringia and Hessen is the main cause for the poor watershed quality of Werra and Weser" (Env. NGO Niedersachsen)[92].

> "Prior to the industrial potash extraction, Weser and Werra were a watershed rich in fish. The salmon as a dominant fish species caused anglers from all over Europe to spend their holidays on the Weser. Several endemic plant and animal species disappeared throughout the 20th century as a product of the massive human interventions. The fish yield of the Weser went back from 200 kg/ha in the 20ies to 80 kg/ha in the 60ies to 4-5 kg/ha at the end of the 90ies" (Env. NGO Thuringia)[93].

Several statements put indeed the present degree of disturbance into perspective by referring to historical values. While the quote above show things getting (we could say) worse and worse, other statements by RT Members closer to the potash industry stress that the situation is getting (we could say) less and less bad:

> "Today's pressures have no comparison with the massive pressures during GDR times" (Municipality of Unterbreizbach)[94].

> "At the times of the German separation, our region had to bear significantly bigger pressures, without any possibility to substantially affect them. After the fall of the German-German border and the merger between east and west factories, technological progress caused substantial progress in the years that followed. The

[92] Original text: *"Die Versalzung durch die Kaliindustrie in Thüringen und Hessen ist einer der Hauptgründe für die schlechte Gewässerqualität in Werra und Weser"*.

[93] Original text: *"Vor dem industriellen Abbau von Kali waren Weser und Werra fischreiche Gewässer. Der Lachs als Leitfisch veranlasste Angler aus ganz Europa, ihren Urlaub an der Weser zu verbringen. Im 20. Jh. verschwanden als Folge der massiven menschlichen Eingriffe viele ursprünglich heimische Tier- und Pflanzenarten aus dem Weser- und Werragebiet. Der Fischertrag der Weser ging von 200 kg/ha in den zwanziger Jahren über 80 kg/ha in den sechziger Jahren auf 4-5 kg/ha Ende der 90er Jahre zurück"*.

[94] Original text: *"Die heutigen Belastungen stehen aber in keinem Verhältnis zu den massiven Belastungen aus DDR Zeiten"*.

> salinity of the Werra could this way be reduced to the emission threshold of 2.500 mg/l" (District of Hersfeld-Rotenburg)[95].

> "The biological state of the Werra has achieved since 2000 indisputable and provable betterments. This is not least the positive result of the high investments that K+S made for the environment" (K+S)[96].

Bluntly put, things may be better than they used to be. That doesn't mean they are good, though. In particular, not all statements agree on the last point, attributing a dominant role to post-2000 improvements and attributing their paternity to the efforts by K+S. Specifically:

> "Due to the dismissal of the former Thuringian factories, the salt input could be reduced between 1990 and 2000 by 90%. The salinity has however stagnated ever since and could not be brought further down. The ecological condition of the Werra is yet to be ranked as 'critical'" (State of Bremen)[97].

> "The Werra finds itself in a clearly better condition compared to the situation at the time of the German reunification. The salt input of up to 40.000 mg/l due to the potash industry of the GDR could be brought down to the 1942 level of 2.500 mg/l. This happened on the basis of an administrative agreement between the States Bremen, Hessen, Niedersachsen, NRW, and Thuringia and the Federal Government. The

[95] Original text: "*Zu Zeiten der innerdeutschen Teilung hatte unsere Region erheblich größere Belastungen zu tragen, ohne wesentlichen Einfluss darauf nehmen zu können. Nach dem Wegfall der innerdeutschen Grenze und dem Zusammenschluss der ost- und westdeutschen Kaliwerke haben sich aufgrund des technologischen Fortschrittes erhebliche Verbesserungen in den nachfolgenden Jahren ergeben. So konnte auch die Salzbelastung der Werra bis auf den Einleitungsgrenzwert von 2.500 mg/l reduziert werden*".

[96] Original text: *"Der biologische Zustand der Werra hat sich seit dem Jahr 2000 unstrittig und nachweisbar deutlich verbessert. Das ist nicht zuletzt das erfreuliche Ergebnis der hohen Investitionen, die K+S zu Gunsten der Umwelt getätigt hat"*.

[97] Original text: *"Durch die Stilllegung ehemaliger thüringischer Kaliwerke wurde die Salzbelastung zwischen 1990 und 2000 bis zu 90 Prozent reduziert. Der Salzgehalt stagniert jedoch seitdem und konnte nicht weiter gesenkt werden. Der ökologische Zustand der Werra ist immer noch als ‚kritisch' einzustufen"*.

Federal Government provided a significant financial support (more than 64 Million DM). Nonetheless is the watershed system still degraded" (Federal Government)[98].

A2.4. The balance between economy and ecology

Addressing watershed quality with reference to abatement efforts from both private (e.g.: K+S) and social/public hands (e.g.: investments by the Federal Government) provides a stepping stone to the topic of balancing socioeconomic and ecological concerns. Behind the act of balancing different dimensions against one another is a zero-sum-game in which fundamental restrictions allow for a limited set of mutually exclusive combinations of the target dimensions at stake. This is to say: one cannot have more of everything – more ecology and more economy. This is so, until a technology emerges that makes salt disposal in the environment ecologically beneficial. This is yet not the case. Under this header, we have scanned the statements for explicit indications and value judgements concerning the terms of this zero-sum game.

Clearly, statements appear to be based on a fundamentally dyadic articulation of the trade-off at hand (ecological vs. economic aspects) rather than on a triadic approach (ecological vs. economic vs. social aspects). In other words, we can detect a particular articulation of the concept of Sustainability. Sustainability is at the very core of the entire RT process or, at least, of its "rhetoric" or language. The concept of inclusion adopted for the process design shows this, as it includes civil society groups, industry representatives and environmental associations along with the people-planet-profit triad.

Dyadic articulations are not much based on the absence or neglect of the social aspects of the salinity problem. They rather emerge from the way the same social

[98] Original text: *"Die Werra befindet sich gegenüber der Situation zur Zeit der Wiedervereinigung in einem deutlich besseren Zustand. Die Belastung aus der Kali-Industrie der DDR von bis zu 40 000 mg/l konnte auf der Grundlage eines Verwaltungsabkommens von 1991 zwischen den Ländern HB, HE, NI, NRW und TH sowie dem Bund unter erheblicher finanzieller Beteiligung des Bundes (mehr als 64 Mio DM) auf den seit 1942 geltenden Wert von 2500 mg/l gesenkt werden. Dennoch ist das Gewässersystem noch immer als degradiert zu bezeichnen".*

aspects are related to the economic ones. We see this in formulations such as the following:

> "A timely implementable overall concept is strictly necessary. It should balance the protection of groundwater and surface water with socio-economic aspects such as the reasonable costs for K+S and the conservation of the workplaces" (Env. NGO Thuringia)[99].

> "The salinity problem of the Werra is a complex one. A solution of this situation demands consideration for both ecological and economic (including legal) aspects" (Env. NGO Hessen)[100].

Other formulations articulate the link to the employment dimension in a more elaborated fashion:

> "The company K+S is the most important employer in East Hessen and has the possibility to exploit higher salinity thresholds until 2012. For this reason, economic activity and a sustainable handling of nature must be harmonised" (State of Bremen)[101].

The essence of these dyadic formulations of the sustainability paradigm lies in the reduction of the social aspect to the employment dimension. Employment is in turn a direct function of the economic dimension, understood in terms of the competitiveness of the potash industry. The following statement makes it explicit:

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[99] Original text: *"Zwingend notwendig ist aber ein zeitnah realisierbares Gesamtkonzept, welches den Schutz von Grundwasser und Fließgewässern mit den sozioökonomischen Aspekten wie den zumutbaren betriebswirtschaftlichen Kosten für K+S und dem Erhalt der Arbeitsplätze vereinbart"*.

[100] Original text: *"Das Problem der Werraversalzung ist komplex. Bei der Lösung dieses Sachverhaltes sind sowohl ökologische als auch wirtschaftliche (sowie ebenso rechtliche) Aspekte zu betrachten und zu berücksichtigen"*.

[101] Original text: *"Da das Unternehmen K+S Kali GmbH der wichtigste Arbeitgeber in Osthessen ist und er bis 2012 höhere Grenzwerte ausschöpfen könnte, muss wirtschaftliches Handeln mit einem nachhaltigen Umgang mit der Natur ein Einklang gebracht werden"*.

> "The RT offers to our generation a unique chance to harmonise the interests of the potash production including its very important jobs with the interests of the at least equally valuable protection of drinking water, nature, watershed and infrastructure" (Municipality of Gerstungen)[102].

The above formulation constitutes a landmark because it shows that the trade-off at hand is not purely between ecological and economic dimensions. Instead, the core economic dimension "potash production" is traded off against other equally economic dimensions (drinking water provision, infrastructure) as well as against intrinsically nature-related dimensions. This is not explicitly acknowledged in all statements:

> "Potash extraction takes place in the Werra valley since more than 100 years. Today more than 4.000 people work in this sector. They constitute more than 10% of the (…) employed population of our district. Furthermore, 300 young people have a chance to learn a qualified profession. Qualified work and training positions are an absolute requisite in the fight against emigration, an issue which strongly affects the District of Hersfeld-Rotenburg. (…) This type of industrial facilities are always connected with certain limitations or disamenities, which so far were always accepted and tolerated by the population. (…) The District of Hersfeld-Rotenburg therefore believes, that we cannot afford to question every industrial activity for matters of environmental protection" (District of Hersfeld-Rotenburg)[103].

A certain line of reasoning is presented here: 1) employment is important; 2) employment comes from potash extraction; 3) potash extraction is industry; 4)

[102] Original text: *"Der Runde Tisch bietet unserer Generation die einmalige Chance, die Interessen der Kaliproduktion inklusive ihrer sehr wichtigen Arbeitsplätze mit den Interessen des mindest ebenso wertvollen Schutzes von Trinkwasser, Gewässern, Natur und Bauwerken weitgehend in Einklang zu bringen".*

[103] Original text: *"Seit mehr als 100 Jahren wird im Werratal Kali abgebaut. Heute arbeiten dort mehr als 4.000 Menschen, das sind 10 % aller sozialversicherungspflichtig Beschäftigten unseres Landkreises. Darüber hinaus erhalten 300 junge Menschen die Chance, einen qualifizierten Ausbildungsberuf zu erlernen. Qualifizierte Arbeits- und Ausbildungsplätze sind unabdingbare Voraussetzungen, der Abwanderung aus den ländlichen Räumen entgegen zu wirken, von der auch der Landkreis Hersfeld-Rotenburg in starkem Maße betroffen ist. (...) Derartige industrielle Anlagen sind leider immer auch mit gewissen Einschränkungen oder Unannehmlichkeiten verbunden, die bislang von der Bevölkerung auch akzeptiert und getragen wurden. (...)Der Landkreis Hersfeld-Rotenburg ist deshalb der Ansicht, dass unsere Gesellschaft es sich nicht leisten kann, jegliche industrielle Betätigung aus Umweltschutzgründen in Frage zu stellen".*

industry always produces environmental nuisances; 5) environmental nuisances can be tolerated and are not worth trading off against employment. This line of reasoning obviously does not apply if a certain industry is traded off against a different industry (e.g. potash production vs. drinking water provision; potash production vs. infrastructure), as it (partly) was in the preceding statement. Hence, this latter statement does not acknowledge that the nuisances created by the potash production also have an economic dimension and, with that, consequences in terms of employment beyond the employees of K+S.

More interesting for us is however that the line of reasoning hinges on step 2: employment comes from potash extraction. This suggests that the target dimension "employment" is a function of another target dimension "potash production" which in turn is a direct function of the pollution abatement required from K+S. This equivalence was already presented above, in the excerpt (from the same statement) announcing that "K+S has communicated in October 2006 that it is currently not possible to reduce the 2.500 threshold without threatening the potash production at the Werra. The discussion on the thresholds is therefore suitable so as to decide whether the potash factories should remain at the Werra. For this reason we look at the initiative of lowering the thresholds with great concern, because most of its supporters have no stakes in terms of employment".

The logic underneath the excerpt above is the following: more abatement means less potash extraction and less potash extraction means less jobs. Here is the core implication of a dyadic approach to the discussion at the RT. Triadic approaches break this syllogism: even reducing social aspects to employment, a full-fledged triadic formulation would want to find the optimal balance between employment, the business goals of K+S and the environment, suggesting that also the first two can be traded off against one another. This perspective is completely missing in the statements, as a product of the syllogism shown above.

Conflating the social and the economic aspects of the trade-off has important implications for the way the terms of the very same trade-off are treated:

> "In our opinion, the realisation of a good ecological status for Werra and Weser, including its extensive floodplains, while simultaneously ensuring jobs in the potash industry and fully protecting drinking water in Hessen and Thuringia, is to be achieved through the following measures…" (Env. NGO Hessen)[104].

If the above statement holds true, the RT does not pursue a specific balance between ecological and economic goals. Instead, it assesses the amount of abatement that can be done holding the present degree of employment constant. Taken by the letter, this reveals that socio-economic goals are pre-ordered to environmental ones.

Furthermore, if social goals (employment) are a direct function of the economic ones (further operation of K+S, including the current level of abatement efforts), the logic above implies that the discussions taking place at the RT aim at assessing how much more abatement can be done with the same effort from K+S. This boils down to optimising K+S's abatement budget in the light of, for example, promising new technologies.

It is perfectly legitimate to prioritise socio-economic goals over environmental ones. This leads however to inconsistencies in the formulations reported in a number of statements. For example:

> "This task is ambitious. It encompasses no less than the further betterment of the ecological state of Werra and Weser as well as a contribution to protecting the workplaces in the potash industry and a strengthening of the economic structures in the affected regions. A long-term solid and truly sustainable concept can only emerge if all perspectives are equally part of the solutions to be produced" (K+S)[105].

[104] Original text: *"Die Herstellung eines guten ökologischen Zustandes für Werra und Weser samt ihrer flächigen Auenbereiche, bei gleichzeitiger Sicherung der Arbeitsplätze in der Kaliindustrie und der einwandfreien Erhaltung des Trinkwassers im hessisch/ thüringischen Raum, ist nach Auffassung des Unterzeichners – unter anderem – mit der Umsetzung folgender Punkte zu erreichen"*.

[105] Original text: *"Dieser Auftrag ist sehr anspruchsvoll. Er umfasst nicht weniger als die weitere Verbesserung des ökologischen Zustands von Werra und Weser ebenso wie einen Beitrag zur Sicherung der Arbeitsplätze in der Kaliindustrie sowie die Stärkung der wirtschaftlichen Strukturen in den betroffenen Regionen. Denn nur, wenn alle Gesichtspunkte gleichermaßen in die zu erarbeitenden Lösungsvorschläge einfließen, kann am Ende ein langfristig tragfähiges und im Wortsinn nachhaltiges Konzept stehen"*.

> "(Our) fundamental expectation towards the RT (is) the sustainable protection of the work and training places in the potash district. (… We also demand …) equal consideration for economic and ecological goals with special attention to social themes and interests" (IGBCE union)[106].

Concerning the first statement, if goal one is pursued by protecting goal two (first sentence), the two goals are not equally part of the solution (second sentence). Namely, goal two is conditional to goal one. In other words, they are *equally part* of the solution in the sense that they are both addressed in it. They are not *equal part* of the solution, though, because they are not granted equal consideration.

Same holds for the second quote: if work and training places are to be protected, economic and ecological goals do not hold the same consideration. It is only by violating the equivalence between social and economic goals the above quotes can regain consistency (e.g. the social goal of protecting employment can be prioritised and be conditional to an equal treatment of ecological and economic, second-order goals).

[106] Original text: *"(Unsere) Grunderwartung an den Runden Tisch (ist die) Nachhaltige Sicherung der Arbeits- und Ausbildungsplätze in den Kalirevieren (... Wir fordern auch die ...) Gleichrangige Verfolgung von ökonomischen wie ökologischen Zielen unter besonderen Beachtung der sozialen Themen- und Interessenlagen"*.

Appendix 3 – Analysis of the minutes[107]

Sections: A3.1 Phase 1, Phase 2, Phase 3; A3.2. Procedure*Sample++; A3.3. Measures*Sample++; A3.4. NoProcedure*NoMeasures*Sample++; A3.5. Characterisation by Speaker.

The two topics by far most addressed at the RT correspond to “Measures” and “Procedure”. It is rather commonsensical that the RT deals with measures. Its mission is indeed to identify a set of measures capable of striking a better socio-economic-ecological balance than the present one. It is however rather insightful to see that the terms of the process are an equally frequent topic of discussion: it tells us that the Members at the RT spend at least as much time to structure the process and the decision as they do addressing and exploring the specific palette of measures they are to choose among.

Within the sample, these two topics come up in more than one statement out of four. If we look at the bottom of the list, we have instead intuitively important topics with surprisingly low frequencies (e.g.: EuWFD f=0.01). We will show further in the analysis that these topics gain relevance for specific sub-samples. Here, instead, we intend to stress a different point: matters of space forbid us an analysis topic by topic and/or an analysis based on the 30+ topics enlisted in Table 5.7 (Chapter 5). We will instead divide the entries in frequency groups distinguishing: 1) the top entries, 2) entries above the 90th percentile, 3) entries above the 75th percentile and 4) entries below the 75th percentile. We will then restrict the analysis to the first 3 groups and observe their changes across sub-samples.

Above the 90th percentile, together with “Measures” and “Procedures” we have the codes “Legal” and “Available Information”. Legal aspects pertain the juridical and administrative dimension of the Werra process, while the information issues refer to

[107] Please note: this Appendix was originally part of Chapter 5 and has later been taken out for matters of space and readability. For information on methodological aspects and for a summary of the insights, please refer to Chapter 5, Sections 5.2.2.1. and 5.2.2.3. respectively.

the question of evidence and knowledge underpinning present and past decisions. Roughly one argument out of 7 deals with those topics in the overall sample.

Above the 75th percentile we have arguments addressing questions of time, present and future arrangements, the effects of specific measures and/or the present state of environmental disturbance in the Werra, and finally arguments pertaining to the economics of the Werra process. By looking at the frequencies, we see however that these arguments appear by far less often than those pertaining procedural matters or specific measures. In absolute terms, we have 31 statements referring to economic issues out of 482, while solutions and the effects of specific activities on the environment appear in 45 and 43 statements respectively. What this seems to suggest is that discussions seldom took an overarching approach and rather focused on detail questions and particular issues.

A3.1. Phase 1, Phase 2, Phase 3

Table A3.1, Table A3.2 and Table A3.3 present the topic frequencies for Phase 1, Phase 2 and Phase 3 respectively. By looking at them we can gain insights on the development of the discussions across time. The timing of the phases depends on specific events within the timeline of the RT process. Hence, we can interpret similar developments as the likely effects these events had on the discussions. We can then test, whether they actually constitute turning points in the overall debate (against an assumption of linearity). In order to do so, our first step is to characterise the different phases. Table A3.1 presents the relative frequencies for Phase 1.

Within Phase 1, almost one third of the arguments pertain to procedural issues and measures. While measures are referred to with a just slightly over-proportional frequency, procedural aspects appear strongly over-proportional. This reflects the fact that the RT was busy with its own constitution and with getting the working rules up and running. Above the 90th percentile we also find knowledge and legal matters, exactly as we did while characterising the sample as a whole. Furthermore, the two topics appear in a similar proportion in Phase 1 and in the whole sample. From this

we can read that the role knowledge and legal aspects played throughout the whole discussion is well represented in Phase 1.

Topic/Code	f	Freq. Thresholds
Procedures (*"Prozedur"*)	0,32 (62)	Max
Measures (*"Maßnahmen"*)	0,28 (54)	
Available information (*"Vorhandene Information"*)	0,16 (30)	
Legal (*"Rechtliches"*)	0,12 (23)	>90-Percentile (0,12)
Disposal practice (*"Entsorgungspraxis"*)	0,10 (19)	
State of disturbance (*"Belastungssituation"*)	0,09 (17)	
Economicity (*"Wirtschaftlichkeit"*)	0,08 (15)	
Need of clarification (*"Klärungsbedarf"*)	0,06 (12)	
Time (*"Zeit"*)	0,05 (10)	>75-Percentile (0,05)
N:	192	

Table A3.1 – Relative frequencies of topics in Phase 1.
Absolute frequencies in parentheses.

Above the 75th percentile we find frequent references to the current disposal arrangements, to the state of environmental distress of the Werra-Weser watershed, to economic aspects of the debate at the RT. In slightly smaller proportions we also find references to specific knowledge gaps and to time matters. We can thus characterise Phase 1 as a discussion structured so as to address the link between ecological and economic issues, pointing out at specific knowledge gaps and stressing a certain degree of urgency, possibly in the light of the legal matters connected to the authorisation regime for the operations of K+S.

Table A3.2 portrays instead the debate that has taken place during Phase 2. Phase 2 constitutes a shorter phase, compared to both Phase 1 and Phase 3 ($N_{Phase\ 1}$=192; $N_{Phase\ 2}$=85; $N_{Phase\ 3}$=205)[108]. It was triggered by the sudden announcement of the Measures Package by K+S and by the related Public-Law arrangement that K+S and the States of Thuringia and Hessen stipulated off the RT. Procedural issues lose

[108] Please note that the sample is representative in terms of the relative weight of the meetings. More specifically, the no meeting is over or under represented in Sample++, so that we can take the N of each sub-sample as a proxy for the length of the respective minutes.

weight and appear strongly under-proportional compared to the overall sample. We assist, though, at a high increase in legal-related arguments and of knowledge matters above the 90th percentile. Further below we find frequent references to matters of time and to individual effects.

Topic/Code	F	Freq. Thresholds
Measures (*"Maßnahmen"*)	0,27 (23)	Max
Available information (*"Vorhandene Information"*)	0,21 (18)	
Legal (*"Rechtliches"*)	0,20 (17)	
Procedures (*"Prozedur"*)	0,18 (15)	>90-Percentile (0,17)
Time (*"Zeit"*)	0,14 (12)	
Effect (*"Auswirkungen"*)	0,13 (11)	
Watershed quality (*"Gewässerqualität"*)	0,07 (6)	
Expertise (*"Expertise"*)	0,06 (5)	
Consent/Consensus (*"Konsens"*)	0,06 (5)	
Injection practice (*"Versenkung"*)	0,06 (5)	>75-Percentile (0,06)
N:	85	

Table A3.2 – Relative frequencies of topics in Phase 2.
Absolute frequencies in parentheses.

In a smaller proportion, references to the quality of the watershed, to the commissioning of expert assessments, to matters of consensus and agreement among RT Members and to the injection practice stick out. The latter topics do not represent the core of the discussion. Though, they reflect further specific aspects of the process that had their prime time during Phase 2: this is namely the moment where the need for specific pieces of information and knowledge led to commissioning the corresponding assessments to external experts.

The injection practice, on its part, represents an important topic in the overall narrative of the RT debate. It constitutes a disposal channel for about half of the salt-rich wastewater produced by K+S. Slightly after the announcement of the Measures Package, the injection practice is proven environmentally unsafe due to leakages in the underground, forcing the stipulation of the agreement between K+S and the two abovementioned administrations. This circumstance alone justifies the peak in the incidence of legal aspects in the debate ($f_{Sample++}$=0,13; $f_{Phase\ 1}$=0,12; $f_{Phase\ 2}$=0,20; $f_{Phase\ 3}$=0,11). As the frequencies show, the injection practice emerged as a topic exactly within Phase 2. It maintained its position on the agenda throughout Phase 3

as well (it appears in about 6 percent of the statements), even if it didn't make it above the 75th percentile.

Given the announcement of the Package, and the emergence of the underground issue, the increased reference to the state of the watershed comes to no surprise. This is particularly so in the light on the strong focus on specific effects and effectiveness (one statement out of 8). The over-proportional reference to matters of consensus within the RT ($f_{Sample++}$=0,04; $f_{Phase\ 1}$=0,02; $f_{Phase\ 2}$=0,06; $f_{Phase\ 3}$=0,04) is instead to be read in connection to the modality adopted to K+S so as to develop and communicate its Package. As presented above, the Package was developed in secrecy and announced as a fait accompli to the Members of the RT. The frequency of arguments on consensual issues testifies that during Phase 2 indeed many words were spent on how to proceed so as to achieve a solution with a broad ownership rather than something produced by K+S in isolation.

Phase 3 presents the relative frequencies shown in Table A3.3. Measures and procedures maintain the top of the list, though they appear under-proportionally compared to the overall sample.

Topic/Code	**f**	**Freq. Thresholds**
Measures (*"Maßnahmen"*)	0,24 (50)	Max
Procedures (*"Prozedur"*)	0,24 (50)	Max
Available information (*"Vorhandene Information"*)	0,17 (35)	
Solutions (*"Lösungsansätze"*)	0,16 (33)	>90 Percentile (0,16)
Time (*"Zeit"*)	0,16 (32)	
Effect (*"Auswirkungen"*)	0,14 (28)	
Local conditions (*"Standortbedingungen"*)	0,12 (24)	
Legal (*"Rechtliches"*)	0,11 (23)	
Expertise (*"Expertise"*)	0,09 (19)	>75-Percentile (0,09)
N:	205	

Table A3.3 – Relative frequencies of topics in Phase 3.

Absolute frequencies in parentheses.

Legal aspects lose ground, and leave space above the 90th percentile to the formulations of likely solutions. This is not surprising, as we deal with the end of the process. It is however surprising that solutions were formulated only at the end and not throughout the whole process. While they make it above the 90th percentile in

Phase 3, they never even make it above the 75th percentile in either Phase 1 or 2. The fact that they appear above the 75th percentile in Sample++ having a significant presence only in Phase 3 suggests that solutions were addressed per se and explicitly. They were addressed only through their elements. This is an additional element in support of the thesis that the discussions at the RT are best described as a process of detailing-out the matter rather than one of achieving an overarching perspective.

It is noteworthy that Phase 3 has a higher 75th percentile (0,09) compared to Phase 1 (0,06), Phase 2 (0,05) and the sample as a whole (0,06). This is an effect of several issues gaining ground against Procedure and Measures, even if they do not make it above the 90th percentile. First of all, we have a further increase in the references to the expert assessments. This can be connected to the fact that those assessments commissioned during Phase 1 and, most of all, Phase 2 return their results during Phase 3. The comparatively high frequency ($f_{Sample++}$=0,06; $f_{Phase\ 1}$=0,02; $f_{Phase\ 2}$=0,06; $f_{Phase\ 3}$=0,09) testifies that the assessments as such were object of discussion and not only their results.

Secondarily, the focus on local conditions, effects and time can instead be put in relation, on the one hand, to the geographical dimension of the proposed solutions and, on the other hand, to their performance against the authorisation issues. Through these frequencies we can think of the relative role of the NIS against the pipeline solution in terms of a debate between local and extra-local solutions and between solutions compatible with the present authorisation regime, up and running by 2011/2012, and solutions that need intermediate arrangements. This labelling is part of the way the discussion of measures was structured and it is thus present throughout the whole debate. The frequencies above seem however to suggest that it became a prominent, recurrent trait of the discussion only during Phase 3.

Having characterised all three phases, we can now add flesh to the bones of our exploration of the minutes. A discussion emerges which focuses chiefly on matters of method and on the measures at stake as its main content. The overall discussion addresses them with an eye on the legal and administrative process and on the provision of scientific evidence for the arguments advanced. Throughout the process, we have several themes alternating somehow “in the background” of this general

approach. We therefore witness a discussion on the terms of the economic-ecological issue at first, on legal and technical implications half way through, and on spatial and temporal conditions in the end.

*A3.2. Procedure*Sample++*

We can now enrich our characterisation and look closer into the role of the several themes of the discussion by extracting sub-sets of the overall sample. Table A3.4 shows the frequencies of the topics mentioned in combination with the topic "Procedure". More specifically, it restricts the set of statements to those referring to procedural issues (N=127). We label the sub-set thus produced "Procedure*Sample++".

All these statements are coded as "Procedure". It therefore comes to no surprise that "Procedure" has a frequency of 1,00. As the topics were not attributed to statements in a mutually exclusive way, we can now look at what other topics were referred to "in combination" with "Procedure". Above the 90th percentile we find "Available Information", "Measures" and "Solutions". What we can read out of this is that procedural issues for the most addressed matters of how to approach the information gaps encountered and how to process the information available and/or to be produced.

Appendix 3 – Analysis of the minutes

Topic/Code	f	Freq. Thresholds
Procedures (*"Prozedur"*)	1,00 (127)	Max
Available information (*"Vorhandene Information"*)	0,17 (22)	
Measures (*"Maßnahmen"*)	0,16 (20)	
Solutions (*"Lösungsansätze"*)	0,15 (19)	>90-Percetile (0,14)
Expertise (*"Expertise"*)	0,12 (15)	
Time (*"Zeit"*)	0,09 (12)	
Effect (*"Auswirkungen"*)	0,05 (6)	
State of disturbance (*"Belastungssituation"*)	0,02 (3)	
Need of clarification (*"Klärungsbedarf"*)	0,02 (3)	
Public/Communication (*"Öffentlichkeit"*)	0,02 (3)	>75-Percentile (0,02)
N:	127	

Table A3.4 – Relative frequencies of the topics mentioned in combination with the topic "Procedure".

Absolute frequencies in parentheses.

The reference to "Measures", "Available Information" and "Solutions" in combination with "Procedure" also supports the thesis of a generally structuring approach to the decision at stake. This becomes more evident if we split the sub-set "Procedure*Sample++" by phase, obtaining the three sub-samples "Phase 1*Procedure*Sample++", "Phase 2*Procedure*Sample++" and "Phase 3*Procedure*Sample++". Table A3.5 shows the respective relative frequencies of the abovementioned combinations. We see thereby that the procedural effort at the RT had a different focus in each of the three phases: in Phase 1 the combination "Measures*Procedure" returns the highest frequency, while "Available Information*Procedure" is on the top of Phase 2 and "Solutions*Procedure" ranks highest in Phase 3.

Topic/Code	$f_{Phase\ 1}$	$f_{Phase\ 2}$	$f_{Phase\ 3}$
Available information (*"Vorhandene Information"*)	0,10 (6)	0,47 (7)	0,18 (9)
Measures (*"Maßnahmen"*)	0,29 (18)	0,00 (0)	0,04 (2)
Solutions (*"Lösungsansätze"*)	0,08 (5)	0,07 (1)	0,26 (13)
N:	62	15	50

Table A3.5 – Relative frequencies of selected topics by phase.

Absolute frequencies in parentheses.

*A3.3. Measures*Sample++*

Similarly to "Procedures", Measures acquired different characterisations throughout the process. Table A3.6 presents the frequencies for the subset "Measures*Sample++" (N=127).

Topic/Code	f	Freq. Thresholds
Measures (*"Maßnahmen"*)	1,00 (127)	Max
Procedures (*"Prozedur"*)	0,16 (20)	
Time (*"Zeit"*)	0,13 (17)	
Local conditions (*"Standortbedingungen"*)	0,09 (12)	>90-Percentile (0,09)
Effect (*"Auswirkungen"*)	0,09 (11)	
Injection practice (*"Versenkung"*)	0,09 (11)	
Solutions (*"Lösungsansätze"*)	0,07 (9)	
Need of clarification (*"Klärungsbedarf"*)	0,06 (8)	
Available information (*"Vorhandene Information"*)	0,06 (8)	>75-Percentile (0,06)
N:	127	

Table A3.6 – Relative frequencies of the topics mentioned in combination with the topic "Measures".

Absolute frequencies in parentheses.

Reference to measures appear "most frequently" in connection with procedures, as we could have expected in the light of the above. The connection to time and to local conditions is also a frequent one, as it appears from the topics above the 90th percentile. From the analysis of Sample++ across phases, we can also expect this connection to get stronger over time. Furthermore, frequency are relatively low, suggesting a certain heterogeneity of the sub-set's top entries across phases. Table A3.7, A3.8 and A3.9 show the most frequent topics (above the 75th percentile) for Phase1, 2 and 3 respectively.

Appendix 3 – Analysis of the minutes

Topic/Code	f	Freq. Thresholds
Measures (*"Maßnahmen"*)	1,00 (54)	Max
Procedures (*"Prozedur"*)	0,33 (18)	
Need of clarification (*"Klärungsbedarf"*)	0,09 (5)	
Time (*"Zeit"*)	0,07 (4)	
State of disturbance (*"Belastungssituation"*)	0,07 (4)	>90-Percentile (0,07)
Effect (*"Auswirkungen"*)	0,06 (3)	
Local conditions (*"Standortbedingungen"*)	0,04 (2)	
Injection practice (*"Versenkung"*)	0,04 (2)	
Available information (*"Vorhandene Information"*)	0,04 (2)	
K+S (*"K+S"*)	0,04 (2)	
Consent/Consensus (*"Konsens"*)	0,04 (2)	
Economicity (*"Wirtschaftlichkeit"*)	0,04 (2)	>75-Percentile (0,04)
N:	54	

Table A3.7 – Relative frequencies of the topics mentioned in combination with the topic "Measures" in Phase 1.

Absolute frequencies in parentheses.

Topic/Code	f	Freq. Thresholds
Measures (*"Maßnahmen"*)	1,00 (23)	
Time (*"Zeit"*)	0,17 (4)	
Effect (*"Auswirkungen"*)	0,17 (4)	
Watershed quality (*"Gewässerqualität"*)	0,13 (3)	
Economicity (*"Wirtschaftlichkeit"*)	0,13 (3)	>90-Percentile (0,13)
Local conditions (*"Standortbedingungen"*)	0,09 (2)	
Available information (*"Vorhandene Information"*)	0,09 (2)	
Feasibility (*"Machbarkeit"*)	0,09 (2)	
Legal (*"Rechtliches"*)	0,09 (2)	
Production (*"Produktion"*)	0,09 (2)	>75-Percentile (0,09)
N:	23	

Table A3.8 – Relative frequencies of the topics mentioned in combination with the topic "Measures" in Phase 2.

Absolute frequencies in parentheses.

We see that the link to procedural issues is strongest during Phase 1 while it disappears from the top percentiles in Phase 2 and Phase 3. We also see that within the broader sub-sample "Measures*Sample++" time-related references to measures always appear in the top percentiles, with a growing tendency. Overall, we can characterise Phase 1 as strongly focused on the link between procedural aspects at the RT and the (selection of) measures, while Phase 2 and Phase 3 restrict the focus to matters of timely implementation. While Phase 2 deals intensively with measures in relation to their effects, Phase 3 becomes more specific and concentrates on the geographical dimension of the measures at stake.

Topic/Code	f	Freq. Thresholds
Measures (*"Maßnahmen"*)	1,00 (50)	Max
Time (*"Zeit"*)	0,18 (9)	
Injection practice (*"Versenkung"*)	0,18 (9)	
Local conditions (*"Standortbedingungen"*)	0,16 (8)	>90-Percentile (0,16)
Solutions (*"Lösungsansätze"*)	0,14 (7)	
Effect (*"Auswirkungen"*)	0,08 (4)	
Available information (*"Vorhandene Information"*)	0,08 (4)	
K+S (*"K+S"*)	0,08 (4)	
State of disturbance (*"Belastungssituation"*)	0,06 (3)	
Feasibility (*"Machbarkeit"*)	0,06 (3)	
Legal (*"Rechtliches"*)	0,06 (3)	
Consent/Consensus (*"Konsens"*)	0,06 (3)	>75-Percentile (0,06)
N:	50	

Table A3.9 – Relative frequencies of the topics mentioned in combination with the topic "Measures" in Phase 3.

Absolute frequencies in parentheses.

The above characterisation finds a clear correspondence with the timeline of the events at the RT. Phase 1 is mostly centred on a structured, stepwise assessment of the measures at stake, hence the reference to "Procedures". Phase 2 was triggered by the announcement of the Measures Package and by the news concerning the unlikely renewal of the injection practice, hence the reference to matters of effectiveness (e.g.: is the Package effective?) and to matters of time (e.g.: how to proceed beyond 2012? Are measures up and running by then?). Phase 3 is then focused on the debate concerning the relative role of NIS and pipeline, hence the reference to the geographic dimension (e.g.: local solutions vs. extra-local solutions) and to time (e.g.: long construction time of the pipeline; mid-term availability of the NIS).

We have thus characterised the references to procedural aspects and to the measures throughout the debate at the RT. For the sake of completeness, we can now turn to those topics left out by the sub-samples addressed above.

*A3.4. NoProcedure*NoMeasures*Sample++*

Table A3.10 presents the ranking of relative frequencies for a sub-sample obtained by the intersection of the complementary sets of "Measures" and "Procedure". We can label such sub-sample "NoMs*NoPr*S++", abbreviating "NoMeasures*NoProcedure*Sample++". For each entry, Table 18 also presents the relative frequency of the topic within the sample "NoProcedure*Sample++" ("NoPr*S++"). We can think of these latter frequencies as the relative incidence of topics when the RT Members "get to business" and leave technical and procedural details behind. The underlying assumption is that whenever they do not talk about procedural matters, they must be dealing with substantial issues.

Topic/Code	**$f_{NoPr*S++}$**	**$f_{NoMs*NoPr*S++}$**	**Freq. Thresholds**
Legal (*"Rechtliches"*)	0,17 (61)	0,22 (55)	Max
Available information (*"Vorhandene Information"*)	0,17 (61)	0,22 (54)	
Effect (*"Auswirkungen"*)	0,10 (37)	0,11 (27)	
Time (*"Zeit"*)	0,12 (42)	0,11 (27)	>90-Percentile (0,11) NoMs*NoPr*S++
Economicity (*"Wirtschaftlichkeit"*)	0,09 (31)	0,10 (26)	
Disposal practice (*"Entsorgungspraxis"*)	0,07 (25)	0,09 (22)	
State of disturbance (*"Belastungssituation"*)	0,08 (28)	0,08 (21)	
Need of clarification (*"Klärungsbedarf"*)	0,08 (27)	0,08 (19)	
Solutions (*"Lösungsansätze"*)	0,07 (26)	0,08 (19)	>75-Percentile (0,08) NoMs*NoPr*S++
N:	355,00	248,00	

Table A3.10 – Relative frequencies of the topics mentioned in the sub samples NoPr*S++ and NoMs*NoPr*S++.

Absolute frequencies in parentheses.

Legal and knowledge-related matters appear in almost one statement out of four, two times as often as their direct followers "Time" and "Effects". We can see this in Table A3.11, Table A3.12 and Table A3.13 below, reporting the relative frequencies by phases. The first two topics appear in the 90th percentile throughout the whole debate, while the latter two fail to do so only in Phase 1. We can also see that the entries between the 75th and the 90th percentile appear rather heterogeneous across phases, supporting the idea of thematically different phases within the process.

Topic/Code	$f_{NoPr*S++}$	$f_{NoMs*NoPr*S++}$	Freq. Thresholds
Available information (*"Vorhandene Information"*)	0,18 (24)	0,24 (23)	Max
Legal (*"Rechtliches"*)	0,17 (22)	0,22 (21)	
Disposal practice (*"Entsorgungspraxis"*)	0,15 (19)	0,19 (18)	
Economicity (*"Wirtschaftlichkeit"*)	0,12 (15)	0,14 (13)	>90-Percentile NoMs*NoPr*S++ (0,14)
State of disturbance (*"Belastungssituation"*)	0,13 (17)	0,14 (13)	
Production (*"Produktion"*)	0,07 (9)	0,10 (9)	
Need of clarification (*"Klärungsbedarf"*)	0,09 (12)	0,07 (7)	
Watershed quality (*"Gewässerqualität"*)	0,06 (8)	0,07 (7)	
Jobs (*"Arbeitsplätze"*)	0,05 (6)	0,06 (6)	>75-Percentile NoMs*NoPr*S++ (0,6)
N:	130,00	94,00	

Table A3.11 – Relative frequencies of the topics mentioned in the sub samples NoPr*S++ and NoMs*NoPr*S++ in Phase 1.

Absolute frequencies in parentheses.

Topic/Code	$f_{NoPr*S++}$	$f_{NoMs*NoPr*S++}$	Freq. Thresholds
Legal (*"Rechtliches"*)	0,24 (17)	0,32 (15)	Max
Available information (*"Vorhandene Information"*)	0,16 (11)	0,19 (9)	
Effect (*"Auswirkungen"*)	0,16 (11)	0,15 (7)	
Time (*"Zeit"*)	0,14 (10)	0,13 (6)	>90-Percentile NoMs*NoPr*S++ (0,12)
Consent/Consensus (*"Konsens"*)	0,07 (5)	0,11 (5)	
Expertise (*"Expertise"*)	0,06 (4)	0,09 (4)	
Injection practice (*"Versenkung"*)	0,06 (4)	0,09 (4)	
Politics (*"Politik"*)	0,06 (4)	0,09 (4)	
State of disturbance (*"Belastungssituation"*)	0,06 (4)	0,09 (4)	>75-Percentile NoMs*NoPr*S++ (0,09)
N:	70	47	

Table A3.12 – Relative frequencies of the topics mentioned in the sub samples NoPr*S++ and NoMs*NoPr*S++ in Phase 2.

Absolute frequencies in parentheses.

Topic/Code	$f_{NoPr*S++}$	$f_{NoMs*NoPr*S++}$	Freq. Thresholds
Available information (*"Vorhandene Information"*)	0,17 (26)	0,21 (22)	Max
Effect (*"Auswirkungen"*)	0,15 (23)	0,18 (19)	
Legal (*"Rechtliches"*)	0,14 (22)	0,18 (19)	
Time (*"Zeit"*)	0,16 (25)	0,16 (17)	>90-Percentile NoMs*NoPr*S++ (0,16)
Local conditions (*"Standortbedingungen"*)	0,15 (24)	0,15 (16)	
Solutions (*"Lösungsansätze"*)	0,13 (20)	0,13 (14)	
Economicity (*"Wirtschaftlichkeit"*)	0,08 (12)	0,11 (12)	
Need of clarification (*"Klärungsbedarf"*)	0,08 (12)	0,09 (10)	
K+S (*"K+S"*)	0,08 (12)	0,07 (8)	>75-Percentile NoMs*NoPr*S++ (0,07)
N:	155	107	

Table A3.13 – Relative frequencies of the topics mentioned in the sub samples NoPr*S++ and NoMs*NoPr*S++ in Phase 3.

Absolute frequencies in parentheses.

A3.5. Characterisation by Speaker

Finally, the materials allow us a further characterisation by speaker. As anticipated above, the minutes of the meetings are only partly anonymous. Instead, it is often possible to connect certain arguments to the Member or to the group of Members raising it. By extracting sub-samples accordingly, we can achieve insights on which topics where most often addressed by whom, even across phases. We can do so with reference to the director of the RT, to the representatives of the upstream states of Thuringia and Hessen, to K+S, and with reference to guest experts and the scientific support of the RT. All other statements belong to the RT Members as a group.

Topic-wise, we restrict the analysis to the "NoPr*NoMs*S++" sub-sample. We thus look at statements within Sample++ which make no reference to either Procedure or Measures, so as to minimise the dominance of these two, clearly central topics. As a side effect, we are thus forced to deal with relatively small sub-samples, particularly in the analysis by phase. Conclusions are therefore to be taken with a grain of salt.

Table A3.14 to A3.17 and Table A3.19 report the topics above the 90th percentile from the sub-sample "NoPr*NoMs*S++" split by speaker, respectively for the RT as a

whole, the Direction, the upstream states Thuringia and Hessen, K+S and the Scientific Support.

Sub-Sample	Topics/Codes [f]	90-P	N
Whole	Legal (*"Rechtliches"*) [0,21]; Available information (*"Vorhandene Information"*) [0,16]; Economicity (*"Wirtschaftlichkeit"*) [0,14]; Disposal practice (*"Entsorgungspraxis"*) [0,13];	0,12	87
Phase 1	Disposal practice (*"Entsorgungspraxis"*) [0,27]; Available information (*"Vorhandene Information"*) [0,24]; Economicity (*"Wirtschaftlichkeit"*) [0,2]; Legal (*"Rechtliches"*) [0,15];	0,14	41
Phase 2	Legal (*"Rechtliches"*) [0,42]; Time (*"Zeit"*) [0,26]; Expertise (*"Expertise"*) [0,16]; Consent/Consensus (*"Konsens"*) [0,16]; Injection practice (*"Versenkung"*) [0,16];	0,16	19
Phase 3	Local conditions (*"Standortbedingungen"*) [0,33]; Effect (*"Auswirkungen"*) [0,15]; Solutions (*"Lösungsansätze"*) [0,15]; Legal (*"Rechtliches"*) [0,15]; Economicity (*"Wirtschaftlichkeit"*) [0,15];	0,15	27

Table A3.14 – Relative frequencies of the topics in "NoPr*NoMs*S++" for the RT as a whole by phase.

For the RT as a whole, as we can see in Table A3.14, we find that legal matters ad available information are the most frequent references within the all discussion. This seems to be mostly due to the strong focus given to legal matters during Phase 2. Both Phase 1 and Phase 3 appear instead to set different priorities ("Disposal Practice" with f=0,27 and "Local Conditions" with f=0,33). Table A3.15 reports instead the topics referred to by the Direction of the RT.

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Sub-Sample	Topics/Codes [f]	90-P	N
Whole	Expertise (*"Expertise"*) [0,21]; Available information (*"Vorhandene Information"*) [0,19]; Effect (*"Auswirkungen"*) [0,12]; Politics (*"Politik"*) [0,12];	0,11	42
Phase 1	Politics (*"Politik"*) [0,21]; Jobs (*"Arbeitsplätze"*) [0,14]; Expertise (*"Expertise"*) [0,14]; Watershed quality (*"Gewässerqualität"*) [0,14]; Need of clarification (*"Klärungsbedarf"*) [0,14]; Solutions (*"Lösungsansätze"*) [0,14]; Production (*"Produktion"*) [0,14]; Economicity (*"Wirtschaftlichkeit"*) [0,14];	0,14	14
Phase 2	State of disturbance (*"Belastungssituation"*) [0,27]; Expertise (*"Expertise"*) [0,27]; Consent/Consensus (*"Konsens"*) [0,27]; Roßleben (*"Roßleben"*) [0,27]; Injection practice (*"Versenkung"*) [0,27];	0,27	11
Phase 3	Available information (*"Vorhandene Information"*) [0,35]; Effect (*"Auswirkungen"*) [0,24]; Expertise (*"Expertise"*) [0,24]; Visit (*"Besuch"*) [0,12]; Public/Communication (*"Öffentlichkeit"*) [0,12]; Legal (*"Rechtliches"*) [0,12]; Time (*"Zeit"*) [0,12];	0,12	17

Table A3.15 – Relative frequencies of the topics in "NoPr*NoMs*S++" for the Direction of the RT by phase.

The Direction appears to be focused, instead, on matters of knowledge. More than one argument out of five is about the role of the expert assessment (f=0,22). Almost the same holds for available information and knowledge (f=0,19). While these topics appear above the 90th percentile in a regular way across the debate, different phases have different top references. Phase 1 deals most often with the politics of the Werra process. Phase 2 deals on an equally distributed series of topics, involving the present state of disturbance and the injection practice, among other things. Phase 3 presents again a strong focus on the available information, and expert judgement, with particular reference to the effects of the proposed solutions.

The topics referred to by the representatives of the States of Hessen and Thuringia are reported in Table A3.16 below.

Sub-Sample	Topics/Codes [f]	90-P	N
Whole	Legal (*"Rechtliches"*) [0,38]	0,13	45
	Disposal practice (*"Entsorgungspraxis"*) [0,18]		
	Solutions (*"Lösungsansätze"*) [0,18]		
	State of disturbance (*"Belastungssituation"*) [0,13]		
Phase 1	Disposal practice (*"Entsorgungspraxis"*) [0,44]	0,16	18
	State of disturbance (*"Belastungssituation"*) [0,28]		
	Legal (*"Rechtliches"*) [0,22]		
	Available information (*"Vorhandene Information"*) [0,17]		
Phase 2	Legal (*"Rechtliches"*) [0,63]	0,13	8
	Time (*"Zeit"*) [0,38]		
	Politics (*"Politik"*) [0,25]		
	Effect (*"Auswirkungen"*) [0,13]		
	State of disturbance (*"Belastungssituation"*) [0,13]		
	Consent/Consensus (*"Konsens"*) [0,13]		
	Forecast model (*"Prognosemodell"*) [0,13]		
	Available information (*"Vorhandene Information"*) [0,13]		
Phase 3	Solutions (*"Lösungsansätze"*) [0,42]	0,11	19
	Legal (*"Rechtliches"*) [0,42]		
	K+S (*"K+S"*) [0,11]		
	Need of clarification (*"Klärungsbedarf"*) [0,11]		
	Feasibility (*"Machbarkeit"*) [0,11]		
	Time (*"Zeit"*) [0,11]		

Table A3.16 – Relative frequencies of the topics in "NoPr*NoMs*S++" for the Direction of the RT by phase.

Concerning these latter two actors, the focus is of course on legal and administrative matters. As in the previous case, by splitting the sample according to the phases, we see different priorities appearing over the time axis. The current waste disposal arrangements appear as the core point of attention during Phase 1. Phase 2 is characterised by legal-related and administrative-related statements, as for the group as a whole, while nearly half of the statements in Phase 3 address the decision output of the RT and with it the prospected final arrangement. We see instead a different focus if we scan our sample for the topics mentioned by K+S as in Table A3.17 below.

K+S seems to make strong reference to the current production processes. This is logical: within the RT, K+S is best informed on the specificities of its own production facilities and is therefore in the best position to instruct the RT about it. Apparently, that is the role K+S took for itself, at least concerning those statements in which K+S is reported as a speaker. This is particularly striking if we consider that we are here referring to a sub-sample which excludes "Measures". Even when not referring to technical measures and intervention possibilities, K+S seems to show a strongly technical approach to the issue and to its own role at the RT.

Sub-Sample	Topics/Codes [f]	90-P	N
Whole	Production (*"Produktion"*) [0,34]	0,21	29
	Time (*"Zeit"*) [0,24]		
	Effect (*"Auswirkungen"*) [0,21]		
	Available information (*"Vorhandene Information"*) [0,21]		
	Economicity (*"Wirtschaftlichkeit"*) [0,21]		
Phase 1	Production (*"Produktion"*) [0,71]	0,14	7
	Available information (*"Vorhandene Information"*) [0,43]		
	Watershed quality (*"Gewässerqualität"*) [0,29]		
	K+S (*"K+S"*) [0,14]		
	Economicity (*"Wirtschaftlichkeit"*) [0,14]		
Phase 2	Watershed quality (*"Gewässerqualität"*) [1]	0,00	1
Phase 3	Time (*"Zeit"*) [0,33]	0,24	21
	Effect (*"Auswirkungen"*) [0,29]		
	Production (*"Produktion"*) [0,24]		
	Legal (*"Rechtliches"*) [0,24]		
	Economicity (*"Wirtschaftlichkeit"*) [0,24]		

Table A3.17 – Relative frequencies of the topics in "NoPr*NoMs*S++" for the Direction of the RT by phase.

The distribution over time is also noteworthy, as most of the statements by K+S within the "NoPr*NoMs*S++" sub-sample appear during Phase 3. Here we may have a bias through the fact that excluding Measures and Procedures may leave us with a sub-sample which only picks up statements by K+S in Phase 3. We can test for this. Table A3.18 reports the relative frequencies of selected topics referred to by K+S in different sub-samples, together with the sub-sample size. The first column refers to the "NoPr*NoMs*S++" for Phase 3.

If from the first column we move to the second, we include statements that referred, to "Measures"[109]. The size of the Phase 3 sub-sample grows slightly. If from there we move to the fourth column, we release the restriction to Phase 3 and obtain a sample encompassing all three phases. We do witness a certain increase in the number of statements. More than two thirds of the statements voiced by K+S still belong to Phase 3, though. Furthermore, the proportion between these two sets (Phase 3 vs. all set, both including measures) is similar to the proportion between the two sets in column one and three (Phase 3 vs. all set, both excluding measures).

[109] Technically speaking we release the restriction to statements that do not include "Measures".

Topics/Codes	A	B	C	D
Production (*"Produktion"*)	0,24	0,17	0,34	0,20
Legal (*"Rechtliches"*)	0,24	0,17	0,17	0,09
Available information (*"Vorhandene Information"*)	0,14	0,13	0,21	0,16
Economicity (*"Wirtschaftlichkeit"*)	0,24	0,17	0,21	0,14
Time (*"Zeit"*)	0,33	0,30	0,24	0,21
N:	21	30	29	56

Legend:
A = NoPr*NoMs*Phase3*K+S*S++
B = NoPr*Phase3*K+S*S++
C = NoPr*NoMs*K+S*S++ (all Phases)
D = NoPr*K+S*S++ (all Phases)

Table A3.18 – K+S, selected topics.

Basing the analysis on "NoPr*NoMs" doesn't therefore produce a bias, concentrating the statements by K+S in Phase 3. It appears, instead, that Phase 3 has witnessed an increase in the production of statements by K+S. This is in line with the narrative of the discussion, as Phase 3 is characterised by the presentation of the NIS, where K+S has of course the leading role. Table A3.18 also shows that during Phase 3 K+S sets the accent on time, rather then on production techniques. This is in line with the development of the discussion from K+S's position, from displaying the characteristics of the Measures Package to that of promoting the NIS as a solution. While the first represents a bundle of optimisation intervention on the production processes, the second finds its rationale on the timing of the implementation, compared to the pipeline solution. The reference to time comes therefore to no surprise.

We can characterise the role of the Scientific Support of the RT emerging from the minutes through the topics presented in Table A3.18. As one could expect, the topic most often referred to is that of the information and knowledge available for the decision at the RT. Above the 90th percentile we also find geographical considerations and the effects of presents and prospective activities, together with references to the present state of disturbance and to legal and administrative matters.

Sub-Sample	Topics/Codes [f]	90-P	N
Whole	Available information (*"Vorhandene Information"*) [0,39]; Local conditions (*"Standortbedingungen"*) [0,20]; Effects (*"Auswirkungen"*) [0,17]; State of disturbance (*"Belastungssituation"*) [0,13]; Legal (*"Rechtliches"*) [0,13];	0,13	46
Phase 1	State of disturbance (*"Belastungssituation"*) [0,35]; Available information (*"Vorhandene Information"*) [0,35]; Watershed quality (*"Gewässerqualität"*) [0,12]; Forecast model ("Prognosemodell") [0,12]; Legal ("Rechtliches") [0,12]; Effectiveness ("Wirksamkeit") [0,12]; Time ("Zeit") [0,12];	0,12	17
Phase 2	Available information (*"Vorhandene Information"*) [0,38]; Effect (*"Auswirkungen"*) [0,23]; Legal (*"Rechtliches"*) [0,23]; EuWFD (*"WRRL"*) [0,15];	0,14	13
Phase 3	Local conditions (*"Standortbedingungen"*) [0,56]; Available information (*"Vorhandene Information"*) [0,44]; Effect (*"Auswirkungen"*) [0,25]; Need of clarification (*"Klärungsbedarf"*) [0,06]; Legal (*"Rechtliches"*) [0,06];	0,06	16

Table A3.19 – Relative frequencies of the topics in "NoPr*NoMs*S++" for the Scientific Support by phase.

A look at the frequencies across cases allows us to produce a narrative of the role played by the Scientific Support in the overall debate. The Scientific Support is at the centre of the process of gathering and organising information on the measures and their likely effectiveness. It played a central role in commissioning, developing and applying a computational model that has been used so as to forecast the effects of different measure bundles on the most salient ecological dimensions of the Werra-Weser watershed. What we see from Table A3.19 is that "Available Information" is a constant top reference within the statements produced by the Scientific Support. This comes to no surprise.

It is, instead, noteworthy that the present state of ecological disturbance in Werra and Weser and the quality of the overall watershed are high on the ranking in Phase 1. This can be read as an effort to best characterise the status quo situation on which to base a decision at the RT. Similarly to what said about K+S, the focus on geographical considerations in Phase 3 is to be connected with the typology of solutions envisioned at that stage. The focus on legal and administrative aspects, including the EuWFD, has instead to be seen in the context of estimating the

compliance profile of the Package by K+S. On that side, the contribution of the Scientific Support has been crucial, particularly in regard to the preliminary versions of the forecast model used at that point.

Appendix 4 – Analysis of the Interviews[110]

Sections: A4.1. Interviews: 1st Round; A4.2. Interviews: 2nd Round.

A4.1. Interviews: 1st Round

In Chapter 5, Table 5.8 enlisted the topics emerging from the first round of interviews. For the reader's convenience, we reproduce it here below as Table A4.1.

Code	f	Freq. Thresholds
Criteria	1,00 (16)	Max
Motivation (specific)	1,00 (16)	Max
Background and prior experiences	0,94 (15)	
K+S	0,88 (14)	
Information and knowledge	0,88 (14)	>90-Percentile (0,88)
Legal/administrative	0,81 (13)	
Solutions and measures	0,81 (13)	
Contribution of the RT	0,75 (12)	
Chances for the RT	0,69 (11)	
Motivation (generalised)	0,69 (11)	
Pipeline	0,69 (11)	
Politics	0,69 (11)	
Relationship	0,69 (11)	>75-Percentile (0,69)
Groundwater	0,63 (10)	
Trade-off	0,63 (10)	
Consensus	0,56 (9)	
Jobs	0,50 (8)	
Economicity	0,50 (8)	
EuWFD	0,50 (8)	
Public/Communication	0,50 (8)	
Quality of the discussion	0,50 (8)	
Watershed quality	0,50 (8)	
Measures Package	0,38 (6)	
Production	0,31 (5)	
Stake	0,31 (5)	
Technology	0,31 (5)	
Salt heaps	0,25 (4)	
Effects	0,19 (3)	
Authority	0,19 (3)	

[110] Please note: this Appendix was originally part of Chapter 5 and has later been taken out for matters of space and readability. For information on methodological aspects and for a summary of the insights, please refer to Chapter 5, Sections 5.2.3.1. and 5.2.3.3. for the 1st round and Sections 5.2.4.1. and 5.2.4.3. for the 2nd round, respectively.

Code	f	Freq. Thresholds
Role of Science	0,19 (3)	
Sustainability	0,19 (3)	
Werra/Weser	0,19 (3)	
Feasibility	0,13 (2)	
German reunification	0,13 (2)	
Participant's capacities	0,13 (2)	
N:	16	

Table A4.1 – Relative frequencies of the topics mentioned in the interviews (1st Round).

Criteria, Motivation (specific) and Background/Prior experiences appear in all interviews[111], as they reflect the structure of the interview guidelines. The last one plays a minor role in understanding the point of view of the respective interviewee and was rather meant as an ice-breaker. Criteria and Motivation (specific) offer instead rather clear insights in the way the interviewed Members of the RT approached the salinity issue and the whole process revolving around the RT. We will start our analysis from the Criteria mentioned by the interviewees.

A4.1.1.Criteria

These criteria are meant to address the salinity issue. They constitute a benchmark for the evaluation of both the present arrangement and alternative, desirable ones. They can be divided in 5 categories: 1) Environmental, 2) Economic, 3) Political/Administrative, 4) Social, and 5) Procedural criteria.

[111] The actual frequency of the entry "Background and prior experiences" should be 1,00 or better 16/16, as the topic was mentioned in all interviews. However, it does not appear in the coding of one interview due to the fact that some of the interview was lost because of technical problems. For the sake of precision, we left the frequency that emerges from the coding, (0,94 or 15/16) even though it should be considered as 16/16.

A4.1.1.1. Environmental criteria

The first category deals with the effects of particular arrangements on nature and identifies those indicators that a new, alternative arrangement has to consider, and in which way, in order to be desirable.

The criteria implied and/or referred to during the interviews vary however in their degree of generality. Also, they differ concerning whether they point at the state of specific environmental media or take the form, instead, of particular requests. When asked what they looked at so as to judge a given arrangement, some interviewees respond in very general terms, such as these:

> "For me, the focus was the Weser and its strong salinity" (Environment)[112].

> "We want durable improvements in terms of watershed quality" (Riparian)[113].

> "It was about the salt load coming down as runoff (from the heaps). This load has to be reduced" (Industry)[114].

A desirable arrangement has therefore to fulfil the following criteria: it has to reduce the salinity of the Weser (not only for the Werra), it has to do so durably, and it has to address the runoff from the salt heaps. Other passages from the interview materials broaden the scope:

> "From the beginning we have put emphasis (…) on taking all domains of the environmental effects of the salt production into account" (Environment)[115].

[112] Original text: *"Bei mir war die Weser im Fokus, und zwar die starke Versalzung der Weser"*.
[113] Original text: *"Wir wollen nachhaltig die Gewässerqualität verbessern"*.
[114] Original text: *"Es ging um die Salzfracht, die durch die Auswaschung als Salzwasser unten ankommt, diese Salzfracht zu verringern"*.
[115] Original text: *"Wir haben aber vom Anfang an (...) Wert darauf gelegt, dass alle Bereiche der Umweltauswirkungen der Salzproduktion erfasst werden sollten"*.

A broadened scope for the salinity issue at the Werra and Weser includes the removal of the salt heaps as an additional criterion. At the same time, it ideally prevents the problem to be shifted from one environmental medium to another, as it happened in the past with the very same salt heaps and with the injection practice:

> "I have these huge mountains always in front of my eyes (…). If you see all this and live so long at the Werra as I do, more than 50 years, then we say, this has to stop" (Environment)[116].

> "For me, it was important that the problem is solved technically, and not shifted to another area" (Administration)[117].

> "The RT will decide, and I tell you, it will only decide that a shifting of the problem is not allowed" (Environment)[118].

An additional criterion that emerged during the process is the protection of the groundwater:

> "In addition to the desalination of Werra and Weser, there must be an adequate protection of the groundwater. We must be able to end the injection as soon as possible because this (…) is getting beyond any responsibility and out of control" (Environment)[119].

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[116] Original text: *"Ich habe es immer, immer vor meinen Augen die riesigen Berge (...). Wenn man das alles sieht, und lebt schon so lange an der Werra wie ich, über 50 Jahre, dann sagen wir, so geht das nicht weiter"*.
[117] Original text: *"Für mich war wichtig, dass das Problem technisch gelöst wird, und nicht durch eine Umlagerung in ein anderes Gebiet"*.
[118] Original text: "*Und dann wird der RT entscheiden, und dann sage ich Ihnen, dass wir nur so entscheiden werden, dass es natürlich keine Problemverlagerung geben darf*".
[119] Original text: *"Zusätzlich zu der Entsalzung von Werra und Weser hinzu kommt, dass das Grundwasser ausreichend geschützt ist. Dass die Versenkung möglichst schnell beendet werden kann, weil dies (...) eigentlich nicht weiter zu verantworten und zu beherrschen ist"*.

The criteria identifying a desirable arrangement expand to an extent to specific measures that individual members have identified on the basis of their ex-ante knowledge. The following quote expresses a certain preference for local solutions (as much as "possible"), coupled to the pipeline solution:

> "I entered the RT (…) with the goal of doing as much as possible with local solutions, everything which is feasible, and then (introduce) the perspective of a pipeline" (Administration)[120].

Extending the scope to the measures raises then the question of both their specific and overall effectiveness, as in the following quotes:

> "The measures have to improve the situation and have to be environmentally friendly. There's no point in bringing the wastewaters to the North Sea by lorry. It surely won't be a sustainable and environmentally friendly solution in the long run" (Environment)[121].

> "We have a rather political discussion here (…). You can present measures that sound great but in the end have a negative environmental impact" (Industry)[122].

A4.1.1.2. Economic criteria

As for the environmental ones, the economic criteria brought forward by the interviewees largely vary in scope. Some focus narrowly on the abatement costs K+S can bear – the criterion would then be one of minimising them. Other perspectives go

[120] Original text: *"Ich bin ja rangegangen (...) mit dem Ziel, vor Ort so weit wie möglich etwas zu tun, alles was möglich ist, um dann die Perspektive der Leitung (einzuleiten)".*
[121] Original text: *"Die Kriterien sind, dass die Lösungen die Situation verbessern müssen, und müssen umweltverträglich sein. Es bringt jetzt nichts, mit LKWs die Salzwasser in die Nordsee zu fahren oder so was. Es wäre sicherlich keine dauerhafte nachhaltige oder umweltverträgliche Lösung".*
[122] Original text: *"Wir haben hier eine eher politischen Diskussion (...) Man kann Maßnahmen sogar vorführen, die ganz toll klingen, aber die in ihren gesamtökologischen Auswirkungen, negative Ökobilanzen haben".*

as far as to refer to a cost-benefit calculation in social terms. Here, the criterion would be to strike the best balance between costs and benefits for society as a whole. Starting from the former perspective, the competitiveness of the company is at stake:

> "Is the company able to bear it? Can it integrate it in its own economic processes? Can it stay on the market? Every environmental requirement means that the product becomes more pricey, it has to be recovered somehow" (Industry)[123].

Additional abatement costs are interpreted as investments. They are thus linked to a long-term perspective and put in relation to revenues.

> "The company does not generate hundreds of millions every year so as to be able to invest them. Instead, it has to look for ways to realise them" (Industry)[124].

> "If a company has to make an investment of this sort, it needs certainty of planning and it has to be economically profitable for them" (Industry)[125].

Criteria thus emerge concerning the financial feasibility of whatever new arrangement. Furthermore, the investment perspective over time opens up to technological change, which is linked to investments in research:

> "The good thing is that this way the company is given the possibility, through present and expected technical progress, to achieve new insights on how to, let's say, increase its productivity (…). Practically, this means that in the course of these

[123] Original text: *"Kann das Unternehmen das schultern? Kann es das überhaupt in ihren wirtschaftlichen Prozessen darstellen? Kann es am Markt bleiben? Jede Umweltauflage, die da kommt, heißt ja auch, das Produkt wird teurer, es muss irgendwo wieder eingeholt werden"*.
[124] Original text: *"Das Unternehmen generiert auch nicht hunderte von Millionen jedes Jahr, um die investieren zu können, sondern muss man immer gucken, wie bekommt man das hin"*.
[125] Original text: *"Wenn eine Firma so eine Investition machen soll, braucht sie ja Planungssicherheit, es muss sich ökonomisch auch für sie rechnen"*.

> process developments less is generated of those materials that you don't want" (Industry)[126].

Taking a long-term perspective seems however not to be enough for technological progress to bring about its fruits to the mining industry:

> "Mining is something very special. There is few universities, there's not so much competences around (…). For decades, one should have invested much more money into research, and they have to keep doing it. One has to take money in the hand and bring abatement and savings further" (Riparian)[127].

This requires a continued investment in technological change so as to diminish the amount of extracted salt that turns into waste. Local abatement efforts and the ratio between extracted and wasted salt appear here to be things that have to be diminished at first for their own sake, even in the light of a likely pipeline neutralising their effects for the Werra. From this point, a broader perspective introduces socio-economic reasoning:

> "Sure I tried to shift the focus of the discussion to the socio-economic necessity of the environmental pressure. This means: if the factory wants to produce, it has to produce economically. They can surely assess whether it is possible to dispose of the waste in the North Sea within an economic production. If this is still profitable, then we have a possibility for disposal. If this is not profitable anymore, we have to live with the consequence that there will be no production anymore" (Riparian)[128].

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[126] Original text: *"Das Gute ist, dass damit dem Unternehmen die Möglichkeit gegeben wird, im Laufe des feststehenden und zu erwartenden technischen Fortschritts, auch neue Erkenntnisse zu gewinnen, wie man, ich sage mal höhere Ausbeuten erzielen kann […] Das heißt dann ganz konkret, es fallen automatisch innerhalb dieses Verfahrensentwicklungsprozesses wenige Stoffe an, die man nicht haben will"*.

[127] Original text: *"Bergbau ist ja nun was wirklich spezielles. Es gibt auch wenige Unis, so viel Kompetenz ist ja gar nicht da. […] Man hätte da viel mehr Geld über Jahrzehnte in die Forschung reinstecken müssen. Und das muss man auch weiter tun. […] Da muss richtig Geld in die Hand genommen werden, um weiter zu kommen mit der Vermeidung und mit der Verminderung"*.

[128] Original text: *"Natürlich habe ich versucht in der Diskussion (...) den Schwerpunkt auf [17:47] die volkswirtschaftliche (...) Notwendigkeit der Umweltbelastung zu legen. Das heißt, wenn das Werk produzieren will, muss es wirtschaftlich produzieren. Dass im Rahmen der wirtschaftlichen Produktion notwendig ist, diese*

The reasoning suggested herewith is that the environmental arrangement is fixed and non-negotiable in its core: disposal must take place in the North Sea. Given this frame, production is sensible only to the extent it is profitable taking into account that (fixed) degree of abatement. The criterion is therefore one of privately-economic profitability of production conditioned to a fixed, socio-economically set degree of abatement.

A4.1.1.3. Political/administrative criteria

This third category of criteria encompasses, in a narrow interpretation, the legal compatibility of the arrangements. Legal compatibility of measures and arrangements is not self evident. It is even less so from an administrative perspective, dealing with contested pieces of authorisation:

> "We are a riparian community at the Weser and on this point we were already active. We have solicited that the way the pipeline[129] is now being planned, on the basis of a limited permit, is against the law" (Riparian)[130].

> "All these suggestions have a very public (dimension). On the legal side, I have to provide knowledge on what is realistic from the point of view of administrative law,

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Entsorgung in die Nordsee zu schultern, dann wird ja sicherlich gerechnet werden und dann gibt es Entsorgungsmöglichkeiten. Für das lässt sich rechnen und das ganze ist wirtschaftlich darzustellen oder lässt sich nicht rechnen und dann muss man eben mit der Konsequenz leben, dass es keine Kaliproduktion mehr geben wird".

[129] The interviewee is here referring to a pipeline between different K+S facilities, transporting wastewater from a facility on the Fulda river to another one on the Werra. This is not the North Sea pipeline. At the time we are writing, no planning has taken place concerning this other pipeline.

[130] Original text: *"Wir sind Anrainer an der Weser und haben wir uns schon an der Stelle uns eingebracht und darauf hingewiesen, dass es rechtwidrig das ist, wie jetzt die Pipeline geplant werden soll auf Grundlage einer befristeten Erlaubnis".*

> what actually goes. On the other hand, I also have to say what doesn't go. I have to provide a basis for production the company can refer to" (Administration)[131].

Administrative choices and mechanisms are however tied to political mandates. Political mandates are in turn connected to the public opinion. This generates criteria acknowledging the role of politics as a process of its own and capturing the "political feasibility" of specific arrangements:

> "I need a certain acceptance from the side of the population, otherwise the political pressure (interferes) in the long run with politics" (Industry)[132].

> "If the RT recommends a certain solution, it gains weight. And if the public opinion says it is a good solution, I believe this is something one can have political support for" (Environment)[133].

A4.1.1.4. Social criteria

Social criteria aim foremost at maintaining employment in the region. This is consistent with what we anticipated while exploring the statements handed in by the RT Members at the beginning of the process (see the passage on "The balance between economy and ecology" in the analysis of the statements, Subsection A2.4.).

[131] Original text: *"Alle diese Vorschläge, die haben alle auch eben eine ganz staatliche (Dimension). Auf der rechtliche Seite muss ich Wissen einbringen, was aus verwaltungsrechtliche Sicht auch realistisch ist, was wirklich geht. Ich muss andererseits auch sagen, was nicht geht. Dem Unternehmen gegenüber sozusagen eine Produktion beziehen, die sich auf diese rechtliche Grundlage stützt".*
[132] Original text: *"Ich muss auch eine gewisse Akzeptanz bei der Bevölkerung haben, weil da sonst langfristig der politische druck (regt) die Politik auf".*
[133] Original text: *"Da denke ich schon, dass, wenn der RT eine Lösung vorschlägt, diese dann Gewicht haben wird. Und wenn die öffentliche Meinung sagt, ja das wäre doch eine gute Lösung, dass es etwas ist, was man politisch gehen kann".*

> "Already back then, my idea was that we have to maintain employment, and that we have to harmonise it with the interests of nature protection, water, law and all that" (Riparian)[134].

Interviewees also try to strengthen the employment argument by making it functional to other dimensions:

> "That was the situation. Of course my primary objective was to ensure that jobs in the region are not lost, as we are a rural area and I intend to maintain this rural character and further develop it" (Industry)[135].

It is difficult to understand how the rural character of a region can be enhanced by mining and industrial activities. What is probably meant here is that, as typical for rural areas, a certain demographic shrinking is at play. Diminished employment possibilities at K+S may enhance an already ongoing migration process towards urban areas. The criterion here is therefore one of maintaining or even increasing the population in the area. Jobs at and around K+S are functional to that.

Conversely, the employment question is seen as a function of the company's competitiveness, which is in turn harmed by environmental regulations:

> "We have 4.000, 5.000 jobs there. We hate to make sure that they stay competitive for the company" (Industry)[136].

[134] Original text: *"Meine Vorstellung war schon, wir müssen die Arbeitsplätze erhalten, und wir müssen kucken, wie ist das im Einklang zu bringen mit den Interessen des Naturschutzes, Wasser, rechtliche Fragen und all das"*.
[135] Original text: *"Das war die Situation, und natürlich war's mein primäres Interesse sicherzustellen, dass diese Arbeitsplätze in dieser Region erhalten werden, weil wir sind ein ländlicher Raum und ich möchte den Bestand des ländlichen Raum und der Region sichern und in die Zukunft entwickeln"*.
[136] Original text: *"Da haben wir 4.000, 5.000 Arbeitsplätze und man muss auch sehen dass die auch weiter Wettbewerbsfähig für das Unternehmen bleiben"*.

> "I have a real concern for the jobs if you search too hastily for a solution, basically without giving the company enough time to implement it in the long run, taking the economic possibilities into account" (Industry)[137].

The overarching criterion of saving jobs is translated here into saving the company's competitiveness, which in turn means minimising the financial costs of prospective, additional abatement measures and spreading them over the highest possible number of fiscal years.

A4.1.1.5. Procedural criteria

Interviewees do not only have an opinion on how a desirable arrangement for the further operations of K+S shall look like. They also have an opinion on how one must get there. We gather similar instances under the header of procedural criteria. This is evident in the following statement:

> "Our demand is that there must be a coordinated concept between all involved federal states for a sustainable solution of the Werra issue. This is exactly what the RT is working on" (Environment)[138].

What is requested here is not a matter of "what" to achieve but rather a matter of "how" to achieve it. This "how" may be functional to other aspects of "what" to achieve. Such links are not made explicit, though. Among procedural criteria, we find the time taken for a decision at the RT:

[137] Original text: *"Wirklich die Befürchtung um die Arbeitsplätze, wenn man zu schnell nach Lösungen sucht, wo man nicht im Prinzip da auch der Firma, dem Unternehmen eine Gewisse zeit einräumt um das langfristig auch umsetzen zu können, natürlich auch unter die Berücksichtigung der wirtschaftlichen Möglichkeiten".*
[138] Original text: *"Wir haben gefordert, dass ein abgestimmtes Konzept zwischen allen beteiligten Ländern für eine zukunftsfähige Lösung der Werra-Problematik geben soll. Das ist auch genau das woran der RT auch arbeitet".*

> "(At the beginning) I was no friend of the RT, as I assumed that it can also lead to discussing a certain matter forever and ever. Two or three years talk and then no objective is achieved" (Industry)[139].

This conflicts however with the need of a thorough and sound assessment:

> "It's important that basically all questions that were brought to the table are addressed in a sound and scientifically proved way and possibly answered as far as it gets" (Administration)[140].

The latter turns into a criterion of thoroughness and scientific soundness in the assessment and choice of arrangement. Any option qualifies as such if and only if it passes the test of experts and scientists:

> "I support the pipeline (…), but I want to see facts" (Environment)[141].

Scientific assessments must in particular target the economic and the ecological aspects of the proposed measures and close the knowledge gaps that still impede an informed decision:

> "The ecological, most of all the ecological, and of course also the economic feasibility of the pipeline must be assessed. As soon as the results of the assessments are available, we can consider whether its realisation is sensible" (Environment)[142].

[139] Original text: *"(Am Anfang) war ich kein Freund vom RT, weil ich davon ausgegangen bin, dass kann also da hinterher dazu Führen, dass man ein Thema wahnsinnig lang auf die strecke bringt, also dass zwei/drei Jahre Gerede gibt und man kommt zu kein ziel"*.
[140] Original text: *"Aber wichtig ist, dass praktisch alle Fragen, die auf dem Tisch gekommen sind, auch fundiert und wissenschaftlich begleitet bearbeitet werden und soweit wie möglich auch beantwortet sind"*.
[141] Original text: *"Ich bin ein Verfechter der Fernleitung (...), aber ich will auch Fakten auf dem Tisch gelegt haben"*.

> "How much disposal costs can you reasonably request (…) from a company for each ton sales? This is no known dimension: it has been only said all the time that it is too expensive" (Riparian)[143].

The need for an all-encompassing assessment is justified by the fact that the feasible options are actually very few, compared to the seemingly-feasible ones:

> "It was important to me that Life-Cycle-Assessments of the measures are performed and considered. It makes no sense to choose something that sounds good at first sight but has a strongly negative balance along its life cycle. If you recommend it, you should at least know" (Industry)[144].

> "It is in as far still important to show that all abatement measures have actually been assessed and that the pipeline to the North Sea is the only all-round disposal solution that is environmentally friendly" (Environment)[145].

Furthermore, "realism" constitutes an important criterion among the procedural ones:

> "For me it was important not to lead a discussion in terms of wishful thinking but instead to have an appropriate consideration for socio-economic realities" (Industry)[146].

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[142] Original text: *"Jetzt muss noch die ökologische, vor allem die ökologische und natürlich auch die ökonomische, die wirtschaftliche Machbarkeit dieser Leitung muss geprüft werden. Wenn das Prüfungsergebnis vorliegt, dann kann man weiter nachdenken, nutzt die Fernleitung gebaut"*.

[143] Original text: *"Was ist einem Unternehmen zuzumuten (...) pro Tonne verkauften Kalisalz Entsorgungskosten? Das war ja im Prinzip keine Größe die bekannt war: es wurde immer nur gesagt es ist zu teuer"*.

[144] Original text: *"Diesen Ökobilanz von Maßnahmen, dass man sie zunächst mal aufstellt und dann berücksichtigt, das war mein Anliegen. Es macht keinen Sinn, etwas, was (...) auf den ersten Blick auch gut aussieht, zu beschließen, was aber in der Ökobilanz dann nachher doch deutlich negativ ist. Wenn man das vorschlägt, sollte man das wenigstens wissen"*.

[145] Original text: *"Insofern ist es auch noch jetzt wichtig, dass es dargestellt wird, dass tatsächlich alle Maßnahmen zur Vermeidung geprüft worden sind, und dass die Pipeline an die Nordsee letztlich auch die einzige, alles entsorgende Lösung ist, die Umweltfreundlich ist"*.

A4.1.2. Motivation (specific)

Under the header "Motivation (specific)" we gathered the answers to the questions concerning what is important to oneself and to the other RT Members. As anticipated above, our aim was to ease the process of articulating one's present and past position by referring to that of others. As a matter of fact, interviewees didn't add much to what already made clear talking about criteria. The "detour" through what is important for others provides us however with important clues concerning 1) how members see one another and 2) what "prejudices" and stereotypes the RT process contributed to remove (or strengthen).

As a matter of fact, most entries here capture the "surprises" specific groups had in dealing with their counterparts. In particular, the attitudes of respectively environmental groups, industry representatives and the administration were dealt with at length. We will therefore proceed by gathering the comments accordingly and address the motivation of 1) environmental groups, 2) industry and 3) administration.

A4.1.2.1. Environment

Members at the RT expected a rather narrow focus from the side of the environmental groups. This translates into a rather undifferentiated articulation of their interests:

> "The angler association strives of course towards the best water quality from the point of view of fish life, chemically and biologically speaking. However, more than hundred years, maybe thousand years have passed since the watershed was absolutely salt

[146] Original text: *"Für mich war wichtig, dass (...) hier nicht eine Diskussion auf den Wölkchen der Wünsche geführt wird, sondern, dass einfach die ökonomischen, sozialen und wirtschaftstrukturellen Realitäten auch eine angemessene Berücksichtigung finden"*.

> free for the last time. (…) The angler association wants to achieve the most ideal biotope possible for the fish" (Industry)[147].

The environment group proved however rather compact and ready to compromise on difficult solutions:

> "First of all I saw the environmental NGOs of the other states as my partners. It turns out that they often cooperated in the past" (Environment)[148].

> "(I thought of the environmental NGOs) as partners, with a rather focused approach and by no means searching for ecological fantasies. Instead, they were rather realistic" (Administration)[149].

As we have seen above, "realism" constitutes an important motive at the RT. The contrast between idealistic stereotypes and the rather pragmatic approach of the environment group characterises many comments by the RT members:

> "Concerning the Naturschutzbund, there is a consideration for what is feasible in reality, in contrast to the idealistic approaches that one may have" (Industry)[150].

[147] Original text: *"Also der Fischereiverband strebt natürlich an eine möglichst vollständig dem Leben vom Fisch im Wasser gerechte Wasserqualität, sowohl von der Chemie als auch von der Biologie herzustellen oder wiederherzustellen, wobei es weit über hundert Jahre her ist, dass die mal Absolut salzunbeeinflusst, vielleicht tausend Jahre, gewesen ist. (...) Also, der Fischereiverband will ein möglichst ideales Biotop für die Fische haben"*.
[148] Original text: *"Als Verbündete, da habe ich natürlich in der ersten Linie die Umweltverbänden der anderen Ländern, wie Niedersachsen und Thüringen gesehen. Es hat sich dann auch so herausgestellt, dass die ja oft zusammen an einem Strang gezogen haben"*.
[149] Original text: *"(Ich dachte an Umweltverbände) ...als Partner, mit durchaus sehr gezielten Vorstellungen, und keineswegs jetzt hier ökologischen Fantasien nachjagen, sondern durchaus schon realistisch"*.
[150] Original text: *"Der Naturschutzbund, da ist es eine Berücksichtigung des in der Realität machbaren, im Gegensatz zu den idealen Vorstellungen, die man haben mag"*.

This "surprise" attaches in particular to two points: 1) the acknowledgement that the feasible improvements in the ecological state of the Werra are limited, and 2) the acknowledgement that jobs are important too. The next excerpts show this:

> "It came out rather quickly, however, that even the environmental NGOs recognise that we cannot do without the salt production, that it will stay for quite some time still, and that we have to feasibly keep it up in an environmentally and watershed-friendly fashion" (Administration)[151].

> "Environmental NGOs have often been told, how the situation is, (…) that they now support objectives that are still quite far away from the good ecological status of a watershed as required by the EuWFD. They accept that the uses of a watershed through human processes and pressures belong to it, and that we do not live in a nature which is completely detached from humans. I have the impression that many representatives are ready to support this way" (Administration)[152].

A4.1.2.2. Industry

Consistently with the display of criteria above, the general expectation towards industry representatives was one of focusing on the socio-economic dimension of the problem, in an attempt to minimise the amount of abatement required from K+S. We can see traces of this expectation in quotes like the following:

[151] Original text: *"Selbst kam es aber auch relativ schnell raus, dass selbst die Umweltverbände anerkennen… anerkannt haben dann, dass man auf die Kaliproduktion nicht verzichten können, dass die auch noch lange sein wird und dass man versuchen muss die so, umwelt- und gewässerverträglich, machbar aufrecht zu halten".*

[152] Original text: *"Ich glaube, dass die Umweltverbände oft gesagt bekommen haben, wie die Situation ist, (...) dass sie auch bereit sind, Ziele mit zu tragen, die vielleicht ein ganzes Stück weg sind von dem guten Zustand eines Gewässers wie es z.B. nach Wasserrahmenrichtlinie gefordert wird, dass Sie ansehen, eben, dass die Nutzungen der Gewässer durch anthropogene Vorgänge und anthropogene Belastungen, dass diese eben auch dazu gehören und wir nicht in einer vom Menschen losgelösten Natur leben… Aber den Eindruck habe ich, dass die dort vor allem die Umweltvertreter dazu bereit sind, diesen Weg zu gehen".*

> "(What count for the industry is the) continuation of the production, of an economic production most of all, and, linked to it, clearly the conservation of the jobs" (Administration)[153].

> "Of course the representatives of the Chamber of Industry and Commerce, who also see the ecological problem, (see) most of all the economic side, that K+S keeps its presence here" (Environment)[154].

This approach is not free of criticism:

> "It turned out that the representatives of the labour unions (…) think very narrowly in employment terms, particularly in an economically difficult time, and that they think in a very narrow time horizon. I have made the same experience with union representatives in other areas" (Administration)[155].

If, however, that was the case, others saw a development in the general attitude of the industry representatives:

> "(…) The unions came however more or less to our side, when they said: this must stop, otherwise the potash production may have troubles with the European Union because, like this, it is so ecologically irresponsible" (Environment)[156].

[153] Original text: *"(Für die Industrie zählt die) Aufrechterhaltung der Produktion und vor allem einer wirtschaftlichen Produktion und damit verbunden, ganz klar der Erhalt der Arbeitsplätze"*.
[154] Original text: *"Natürlich sind von der IHK, (...) die auch die ökologische Seite sehen, aber natürlich in erster Linie (...) die wirtschaftliche Seite, dass K+S weiter eine Präsenz hier hat"*.
[155] Original text: *"Gewerkschaftsvertreter, das hat sich auch gezeigt (...), dass die doch sehr, sehr eng in Richtung Arbeitsplätze denken, vor allem in eine wirtschaftlich etwas schwierige Zeit, und dass sie in einem engen Zeitrahmen denken. Die Erfahrung habe ich auch aus anderen Bereichen mit den Gewerkschaftsvertretern gemacht"*.
[156] Original text: *"(...) Aber die Gewerkschaften haben sich dann auch, mehr oder minder auf unsere Seite gestellt, indem sie gesagt haben: so geht es nicht weiter, weil so könnte die Europäische Union auch der Kaliförderung Schwierigkeiten bereiten, weil es ökologisch so nicht mehr vertretbar ist"*.

> "I was a bit surprised by the workers' and unions' representatives, who also came to our side and said, yes, we have to bring about ecological improvements. This creates new jobs and saves the present ones" (Environment)[157].

The latter remark attaches to an important motive throughout the RT process: whether an increased abatement actually threatens or rather supports employment. The general tenor of the group on this issue is at least one of a mild support for the latter perspective. As the quote suggests this is the case for the industry representatives as well.

A4.1.2.3. Administration

In terms of motivation, the administration is referred to in two respects: concerning its technical nature and concerning its division across the upstream/downstream divide. With reference to the first point, one has to bear in mind that, in the RT composition, the administration group refers to the five federal state administration (Hessen, Thuringia, North Rhine-Westphalia, Niedersachsen and Bremen) and to the representative of the federal government. All these organisations have a twofold nature of political body and administrative unit.

Even though politics play a strong role in the decision-making of similar entities, their representatives at the RT held posts within the administrative units. This circumstance may or may not have been avoided, but it certainly constitutes a factor of limitation in the possibilities for state administrations to contribute to the achievement of a broadly shared solution at the RT: head of administrations can only "move" in their positions if politics allow them to. Politicians do not take part to the RT, though, since technicians do. This gap is evident in the case of Niedersachsen. For all others, it certainly contributes to a certain technocratic perception across the ranks at the RT:

[157] Original text: *"Was mich so ein bisschen gewundert hat, ist natürlich von den Vertretern der Arbeitnehmer und von der Gewerkschaften, die aber auch mit auf unsere Seite gekommen sind und gesagt haben, jawohl wir müssen alle ökologischen Verbesserungen bringen, das schafft Arbeitsplätze und erhält unsere bisherigen"*.

> "State administrations are always technical administrations for the most: they are very knowledgeable in their technical area, water law, EuWFD, etc." (Industry)[158].

There is no full agreement on what is important to them and/or to which extent they are on the same side:

> "In principle, I believe we are on the same wavelength with the other representatives of the state administrations in the same group. There are of course matters where we do not agree on, but we are all after the same goal: to do something for Werra and Weser so as to reach an improvement of their conditions. At the same time (we want to) make the potash production possible. We agree on that" (Administration)[159].

> "My fear was that little openness was to be expected on that side. This didn't happen. Instead, the opposite is true. My impression is that the colleagues took up their share of the overall responsibility of state administrations, even though the jobs are only in Hessen and Thuringia and they are possibly threatened only in Hessen and Thuringia" (Administration)[160].

The opposite is also true, though:

> "Those in Hessen and Thuringia (…) can easily live with it, if the Weser is (polluted) somewhere. They already have the Werra issue. It is Niedersachsen, together with

[158] Original text: "*Die Landesverwaltungen sind ja immer im sehr starken Maß Fachverwaltungen: d.h. die kennen sich mit Ihrem fachlichem Bereich, nämlich Wasserrecht, Wasserrahmenrichtlinie, sehr genau aus*".
[159] Original text: *"Vom Grundsatz her denke ich mal, dass wir mit den anderen Vertretern der gleichen Gruppe auf einer Linie sind, natürlich gibt es da Reibungspunkte wie es auch unter den Vertretern der einzelnen Bundesländern, aber alle werden getragen von dem Ziel, was für Werra und Weser zu tun, um eine Verbesserung des Zustandes zu erreichen. Gleichzeitig (wollen wir) aber auch noch die Kaliproduktion, möglich machen. Da stimmen wir überein"*.
[160] Original text: *"Da hatte ich schon ein bisschen die Befürchtung, als könnte es in dieser (Hinsicht) ein paar Einseitigkeiten geben. Das ist auch nicht eingetreten, im Gegenteil. Mein Eindruck ist, dass die Kollegen sich sehr wohl ihren Anteil an der Gesamtverantwortung der Länder begriffen haben, auch wenn die Arbeitsplätze eben nur in Hessen und Thüringen sind und auch nur in Hessen und Thüringen möglicherweise gefährdet sind"*.

> North Rhine-Westphalia and Bremen that have an interest that no additional pressure is put on the Weser, once the Werra issue is solved. We all agree that the North Sea Pipeline provides such a possibility, but Niedersachsen maintains that it's not an option" (Riparian)[161].

If disagreement is here between Niedersachsen and all others (Hessen, Thuringia, NRW, Bremen), in the quote below it's between upstream states (Hessen, Thuringia) and downstream states (NRW, Bremen, Niedersachsen). This makes up for a certain degree of ambiguity in the process:

> "For the state and federal administrations it was important that they also articulate their position at the RT (…): locals want to get rid of the problem and we a bit further away don't want to get it" (Administration)[162].

The point is by all means how broad or narrow an administration wants to think, when articulating its own interest:

> "What, to my regret, is always the case, is that the single states think and react for themselves only. Now it's Niedersachsen: we don't want salt in the Weser but a pipeline is also not an option. This was the tenor of the statements" (Administration)[163].

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[161] Original text: *"Die Hessener und die Thüringer (...) können locker damit leben, wenn die Weser irgendwo (versalzen ist). Die haben erst mal die Werraproblematik, also. Da sind die Niedersachsen schon noch mal die Bremer und die NRWler, die stark daran interessiert sind (...) dass keine zusätzliche Belastung der Weser stattfindet wenn die Werraproblematik bereinigt ist. Da sind wir alle einig, da ist die Nordseepipeline die Möglichkeit… Das Land Niedersachsen sieht das natürlich immer noch so, das ist keine Variante"*.

[162] Original text: *"Für die Verwaltung des Bundes und der Bundesländer war es wichtig dass sie ihre jeweilige Interesse auch am RT artikulieren (...): die direkt vor Ort wollen das Problem weghaben und wir etwas weiter weg möchten das Problem nicht bekommen"*.

[163] Original text: *"Was natürlich immer wieder der Fall ist, was ich immer bedauere, dass eben die einzelnen Bundesländer auch sehr, sehr auf sich bezogen denken und reagieren. Ob das jetzt Niedersachsen ist: nee, nee, Salz in der Weser wollen wir nicht haben, aber ne Pipeline kommt nicht in Frage. So waren schon die Äußerungen"*.

State administrations and their motivation are frequently mentioned with reference to the injection issue:

> "I was actually surprised that (…) the protection of groundwater (…) moved so strongly to the forefront, (…) and that the administrations also had such a strong interest that it doesn't get into the groundwater. (I was surprised) that the intention was the same as for the nature protection groups, the representatives of the municipalities and the residents" (Environment)[164].

> "What they say, which is a very different thing now, I would say... It is surprising that in such a short time they can come to such a different assessment for a practice, like the groundwater one, that is there since decades. (…) The lesson is however that now we have authorising agencies that pose strict requirements as they haven't done for decades" (Riparian)[165].

The end of the injection practice came to a surprise for many, who instead expected an alliance between K+S and the two upstream state administrations Hessen and Thuringia:

> "Nothing significant has changed concerning the problem situation. There were changes however in the perception of the administrations (…) from Hessen and Thuringia, (…who…) took here and there a critical position towards K+S. That was not what I would have expected: a strong solidarity between these three actors" (Environment)[166].

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[164] Original text: *"Ich war eigentlich auch überrascht, dass halt eben (...) die Grundwassersicherung (...) sehr stark in Vordergrund gerückt war (...). (Ich war überrascht) dass die Behörden auch sehr stark Interesse daran hatten, dass wirklich sicherzustellen, dass es nicht in das Grundwasser geht. Dass da eigentlich die gleiche Intention war wie bei den Naturschutzleuten, bei den Gemeindevertretern und bei den Leuten vor Ort".*

[165] Original text: *"Was die jetzt erzählen, also was sehr unterschiedlich jetzt ist, würde ich mal sagen... Das ist ja erstaunlich, dass (man) innerhalb von so kurzer Zeit an so unterschiedlichen Einschätzungen zu einer jahrzehntelangen Einleitung, jetzt in den Untergrund meine ich (kommen kann). (...) Man muss aber festhalten, dass wir jetzt sozusagen Genehmigungsbehörden haben, die ganz rigide etwas einfordern, was Sie über Jahrzehnte so in der Form nicht gemacht haben".*

[166] Original text: *"Gegenüber der Problemlage hat es sich nicht so wesentlich verändert. Allerdings durchaus in der Wahrnehmung z.B. der Behörden (...) aus Hessen und Thüringen, (...die...) am RT auch gegenüber K+S hier*

However:

> "What I also would like to mention (…is that the Municipality of) Gerstungen achieved that the Gerstunger Mulde[167] cannot be used anymore as a buffer reservoir and forced politicians and administrations not to authorise it any further. This luckily succeeded like that, however it did not succeed because of the RT but because of a legal case, independently of the RT" (Environment)[168].

The quote above basically suggests that the court case in Thuringia may have set a precedent against the injection practice. This may have made injection permits definitely too risky from a legal point of view, pushing the upstream state administrations away from that practice and thus compromising their bond with K+S. If this is the case, the authorising state administrations (Hessen and Thuringia) may have known already long time about the spills from the injection into the groundwater and about the link between the diffuse sources of salinity and the injection practice. It is not that they recently found out, but rather that, with this precedent, it has become legally too risky to further ignore these things.

A4.1.3. Other Topics

Table A4.1 above shows a few more topics above the 75th percentile. Leaving out the ice-breaker "Background and prior experiences", we find: "K+S"; "Information and knowledge"; "Legal/administrative"; "Solutions and measures"; "Contribution of and Chances for the RT"; "Motivation (generalised)"; "Pipeline"; "Politics"; and "Relationship". Some of them can be left out: "Pipeline" and "Solutions and

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und da kritisch verhalten haben. Das war nicht wie ich es eher erwartet hatte: ein Schulterschluss zwischen diesen drei Akteuren".

[167] This is a specific case of saltwater injection in Thuringia.

[168] Original text: *"Was ich auch noch mal erwähnen möchte (…ist, dass die Gemeinde) Gerstungen erreichen konnte, dass die Gerstunger Mulde nicht als Pufferspeicher genutzt werden kann und auch die Politik und Behörde dahin gedrängt hat, das nicht weiter zu genehmigen. Das ist zum Glück so gelungen aber leider nicht gelungen durch den RT sondern durch eine juristische Auseinandersetzung die unabhängig vom RT stattfand".*

measures" deal with technical issues and will be dealt with more thoroughly in the second round of interviews. "Information and knowledge" and "Legal/administrative" expand themes already mentioned above in terms of scientific validation and legal compatibility. We will therefore focus on the remaining ones, starting with K+S and proceeding along the order of Table A4.1.

A4.1.3.1. K+S

K+S is obviously present in every aspect of the interviews. It is however referred to in different ways. While referring to K+S, interviewees mention: 1) its motivation; 2) its situation as a company and as a producer; 3) its contribution to the region and to the solution of the salinity issue; 4) its attitude at the RT.

Concerning the first topic, the motivation of K+S, the interviewees reveal a rather undifferentiated understanding. The company's goal is to "make money" (Riparian)[169], and there's nothing to be done about it, since "a company does what a company has to do" (Riparian)[170]. On a different account, the company's goal is to ensure production "without big obligations on the environmental side" (Administration)[171]. This is not the same as "making money", but still views environmental regulations as in contrast with business goals, something to "fight" against (Environment)[172]. Other stress that the company "has done already quite a lot for the Weser and the Werra and (…) that may be enough" (Administration)[173].

References to the situation of K+S as a company and as a producer focus on the wasteful type of production carried out, which is in contrast with the company's high profits. On the other hand, the recent "good times" are questioned, both in relation to past periods of low profitability in the potash business and in relation to the credit crunch unfolding late 2008.

[169] Original text: *"Ein Unternehmen will Geld verdienen"*.
[170] Original text: *"Aber das unternehmen macht immer was es machen muss"*.
[171] Original text: *"Ohne große Auflagen im Umweltbereich"*.
[172] Original text: *"Ankämpfen"*.
[173] Original text: *"sehr viel erreicht für die Weser und für die Werra und das reicht eigentlich (...) aus*".

The contribution of K+S also targets two different kind of aspects. On the one hand K+S is referred to in the light of its contribution to the local economy, as we have seen above. This is the more obvious kind of contribution attributed to K+S. On the other side, the interview materials present several referrals to the contribution of the company to the solution of the salinity problem. This encompasses both what the company has done in terms of actual abatement and what the company has (or hasn't) invested in research and technical progress. While some stress that the company has done and invested a lot, other maintain that not much or not enough has been done in the last twenty years[174].

Finally, a big topic is the attitude of K+S within and towards the RT. Some stress here that the company has taken an increasingly open attitude, far beyond expectations, and have "really accepted the RT as an institution" (Administration)[175]. Others stress that K+S is struggling with the process, and that it "could have learned much more in how to deal with the public through this whole process" (Environment)[176].

A widespread fear was that K+S would not take the process seriously, considering it an "Alibi-Event" (Administration)[177], which we can take as another word for "Greenwashing". This seems not to be the case, at least as it comes from the first round of interviews. Certain messages on the importance of the environmental protection apparently did come across, and "you can see it in the way they communicate towards the outside" (Riparian)[178]. Though, "a big learning process had to take place at K+S" (Industry)[179] for this to happen.

[174] We have already mentioned the link between abatement technologies, technological progress and research investments in the sector in very similar terms. See "Economic Criteria" in this section.
[175] Original text: *"den RT wirklich als Institution akzeptiert"*.
[176] Original text: *"durch diesen ganzen Prozess doch (...) viel mehr lernen würde über den Umgang mit der Öffentlichkeit"*.
[177] Original text: *"Alibi-Veranstaltung"*.
[178] Original text: *"Sieht man ja auch an der Art und Weise wie sie nach Außen kommunizieren"*.
[179] Original text: *"so ein großes Lernprozess geben musste bei K+S"*.

A4.1.3.3. Contribution and Chances of the RT

Several comments refer to both the likely and the actual contribution of the RT to a solution of the salinity issue. Interviewees generally refer to the process as a very difficult and delicate one.

First of all, the problem is difficult to solve at physical level: the goal of a significant ecological improvement for Werra and Weser is "under the present conditions not to be fulfilled, even with a complete stop of the potash production" (Administration)[180]. This is an acknowledgement of the fact that "diffuse pollution will constitute an environmental pressure on this region for millennia to come. There's nothing one can do to avoid it" (Industry)[181], so that the salinity "simply cannot be removed" (Industry)[182].

Adding on to the physical difficulties, the process is delicate at a social level. At the beginning of the process, "fronts were hardened" (Industry), so that a consensus on concrete solution seemed unlikely and constituted "a far too optimistic expectation" (Industry)[183]. Part of the difficulty also comes from the fact that the RT has no formal decision power: "it is a platform which can help but does not replace everything else" (Riparian)[184].

Interviewees expected to be confronted with a difficult and likely unsuccessful task. Looking back to the accomplishments at the time of the interviews (July/August 2009), they are, in comparison, surprisingly positive. We can group their views of the actual contribution of the RT in three main groups: 1) a contribution to the implementation of a solution; 2) a contribution in terms of knowledge; and 3) a contribution in terms of consensus and mutual relationship between actors. This matches rather neatly with the characterisation they have made of the challenges the RT was initially facing.

In terms of actually solving the salinity issue, some thought in the beginning "that the RT won't contribute much, though now I believe that it can play a role in finding a

[180] Original text: *"(Das Ziel einer erheblichen ökologischen Verbesserung ist) einfach unter den gegebenen Rahmenbedingungen, selbst wenn jemand mit der Kaliproduktion aufhören würde, nicht zu erfüllen"*.
[181] Original text: *"Die diffusen Einträgen werden die Belastungen für die nächsten Jahrtausenden für diese Region belassen. Das ist nicht zu vermeiden"*.
[182] Original text: *"...die Salzbelastung in der Werra (...ist...) einfach nicht aufzuheben"*.
[183] Original text: *"Also, als der RT begann habe ich nicht erwartet dass eine Lösung sehr konkret sich als in Konsens zu findende Lösung herausstellt. Das wäre mir eine zu optimistische Erwartung gewesen"*.
[184] Original text: *"Der RT ist sozusagen ein Gremium was helfen kann, aber alles andere nicht ersetzt"*.

solution. It is valuable that it exists or that it existed" (Administration)[185]. Through transparency and the involvement of all affected parties, working together towards a solution "the likelihood of implementation afterwards is much, much higher, compared to simply commissioning an assessment" (Environment)[186].

Knowledge and information play an important role in the contribution of the RT to the salinity issue, which is consistent with the procedural criteria referred to above. Interviewees acknowledge that "without the RT, participants would certainly not have the knowledge that they have now" (Environment)[187]. This attaches to a recurrent motive throughout the RT: the one of establishing an objective discussion on problems and feasible solutions. An important contribution for that came from "the structure and the Scientific support, which played a big role in treating problems objectively" (Administration)[188].

It's however on the side of consensus and mutual relationship between actors that the RT apparently gave its best: "(after) the big clashes, things got a bit better, due to the efforts of the RT and its Director" (Administration)[189]. From a situation full of contrasts and mutual opposition "the overall will to reach a consensus has grown. I believe this is so, and this is the achievement of the RT" (Administration)[190]. Moving towards a consensual solution required "a big learning process at K+S. This is possibly why the RT was needed" (Industry)[191]. The RT made furthermore "a neutral instance available, that could act as a moderator" (Administration)[192], making it for once possible, "that we process all this together and now hopefully produce

[185] Original text: *"Dass ich zunächst auch gedacht habe, der RT wird nicht viel bringen und ich jetzt der Meinung bin, der RT kann doch sein Teil da, bei der Lösungsfindung (beitragen). Es hat einen Wert, dass es existiert oder existiert hat"*.
[186] Original text: *"Durch den RT ist Transparenz gewährleistet, es sind aus allen Interessengruppierungen Vertreter dort, und wenn die dort gemeinsam eine Lösung erarbeiten, (…), ist die Wahrscheinlichkeit auch nachher der Umsetzung viel, viel größer, als wenn jetzt einfach ein Gutachten gemacht worden wäre"*.
[187] Original text: *"Ohne RT hätten sicherlich alle beteiligten nicht den Stand an Kenntnissen, die sie jetzt haben"*.
[188] Original text: *"Auch der Aufbau, die wissenschaftliche Begleitung, die viel dazu beigetragen hat, Probleme zu versachlichen"*.
[189] Original text: *"(Nach den) großen Widersätzen (…ist…) es etwas besser geworden ist, danke auch der Bemühung des RTs und seiner Vorsitzenden"*.
[190] Original text: *"Die Wille, Konsens zu finden, ist insgesamt (…) gestiegen. Das denke ich schon und das ist der Verdienst des RTs"*.
[191] Original text: *"Man muss zunächst auch mal sehen, dass so ein großes Lernprozess geben musste bei K+S. Deswegen bedurfte es möglicherweise auch des RTs"*.
[192] Original text: *"Dass eine neutrale Instanz vorhanden war, die dann immer noch regulierend eingreifen konnte"*.

recommendations. We will issue them together and we will stand behind them together" (Administration)[193].

A4.1.3.4. Motivation (generalised)

As for the above subsection on "Motivation (specific)", references of this sort relate to the part of the interview, where interviewees are asked to formulate what is important for the fellow colleagues at the RT. Beside articulating other Members' point of view, interviewees produced more general comments and statements for the particular kind of situation the RT constitutes. They thus generated a bundle of statements concerning what is important for a representative in a decision-making process in general, regardless of the specific interest group he/she belongs to.

The picture thus emerging is interesting as it says something about what they believe the process can achieve, dealing with participants with different views and different interests. Starting point is that the process comes after two years "of sometimes very emotional debate. (…) The emotional side of it is a certain one-sidedness" (Administration)[194]. In that context "what can be a nature-like Werra and Weser, what is a reasonable salinity load, was controversial" (Riparian)[195]. For the RT, this meant that "different interests (will) clash on one another, and that is absolutely important, so that one can put oneself in the position of the different parties" (Administration)[196].

Implication for the RT is the "question of the development of what needs to be discussed there, (which) has established different understandings. This is due to the fact that at this RT you have representatives of private initiatives, municipalities, districts, agencies, states, and of course they all have their own understandings of the work here" (Industry)[197]. Different groups have indeed different stakes and "these

[193] Original text: *"Dass man das gemeinsam das alles abgearbeitet und jetzt hoffentlich zu Empfehlungen kommt, die gemeinsam verabschiedet werden und die gemeinsam vertreten werden"*.
[194] Original text: *"Es gab in den ganzen zwei Jahren davor (11:59) teilweise eine sehr emotionale Diskussion. (...) Das emotionale ist meistens eine gewisse Einseitigkeit"*.
[195] Original text: *"Wie eine naturnahe Werra und Weser sein kann und was ist sozusagen zumutbar an Salzlasten, das war ja in der Form ja auch strittig"*.
[196] Original text: *"Mir war es schon bewusst, dass sich da verschiedene Interessen aufeinander Stossen, und das halte ich aber auch für absolut wichtig, damit man sich in die Lage der verschiedenen Parteien versetzen kann"*.
[197] Original text: *"(...) Eine Frage der Entwicklungen des Bedarfs dessen, was dort erarbeitet werden soll, (welche) dann auch unterschiedliche Auffassungen herauskristallisiert hat, der Tatsache Schuld, dass in diesem*

stakes lead to certain sensitivities, and that is how the different points of view at the RT come about" (Industry)[198].

Here is where the process comes in. Participants have certain "ideas and understandings. Now they test altogether, in a process, with a scientific support, which understandings are solid and realistic" (Administration)[199]. The process helps them, in other words, further articulate the few feasible things to do. Representatives are aware of the "expectations with which people were sent to the RT" (Industry)[200]. If those expectations match with the understandings participants have before the process and the process aims at changing these understandings, participants are bound either not to learn from the process or not to fulfil the expectations that have been put on them.

Here we face a conundrum for the effectiveness of the process and its ability to produce consensual arrangements: the process starts with conflicting interests that have to be reconciled but are basically not allowed to change. For some, it's "the usual game: the NGOs are the allies and the Industry is the opponent (…). Nothing can change there, because everybody has to play his or her role" (Administration)[201]. Another, weaker formulation of the same thought is that participants "clearly represent their own position, though they are ready to look for consensus *within their possibilities*" (Administration, emphasis added)[202].

The above introduces a certain degree of discretion, given that, "throughout the discussion (…) participants have noticed that, on the one hand, there are deadlines that one cannot miss and limits that one cannot cross, and that, on the other hand, there are possibilities for tolerant solutions if certain conditions are met" (Industry)[203].

RT Interessenvertreter, Buergerinitiativen, Kommunen, Landkreise, Behörden, Länder, vertreten sind, die natürlich alle ihre eigene Vorstellungen mit dieser Arbeit verbinden".

[198] Original text: *"Aus dieser Betroffenheit entstehen natürlich auch die Empfindlichkeiten und dadurch entstehen auch die unterschiedlichen Sichtweisen am RT".*

[199] Original text: *"Die Leute haben Ideen, Vorstellungen. Jetzt prüfen Sie sozusagen gemeinsam in einem Prozess, mit einer wissenschaftlichen Begleitung, was sozusagen von diesen Vorstellungen belastbar und realistisch ist".*

[200] Original text: *"Mitgespürt war natürlich auch die Erwartungshaltung, mit der die Leute ins Gremium geschickt worden sind".*

[201] Original text: *"Das ist das normale Spiel: die Verbündeten waren die NGOs und die Gegner war die Industrie. (...) Da kann sich nichts ändern, weil jeder dort seine Rolle spielen muss".*

[202] Original text: *"(...) ihre Position, klar vertreten aber bereit sind im rahmen ihrer Möglichkeiten auf Konsens hinzugehen".*

[203] Original text: *"Ich denke mal, dass schon die Beteiligten (...) über diese Diskussion (...) gemerkt haben, dass es einerseits Fristen gibt, die man nicht überschreiten darf, oder Grenzen, die man nicht überschreiten darf, andererseits aber auch Möglichkeiten kulanter Lösungen, wenn man bestimmte Voraussetzungen dafür erfüllt".*

This seems however not to hold for everybody, as "one can see, that the one or the other individual person is bound rather tightly to specific positions (…) and say 'I cannot achieve this in the political arena'" (Industry)[204], so that "you have people that can be flexible at different degrees" (Administration)[205]. Politics play a strong role in delimiting (from the outside) the participants' room for flexible solutions. To that now we turn.

A4.1.3.5. Politics

Interviewees acknowledge that "political support" is necessary for implementing whatever recommendation the RT will come up with. In their understanding, "the RT does not decide anything, it only has the task to advise political fora" (Environment)[206]. We may add that support from civil society and from the company may be as important, or else there would be no RT, but surely administration plays a prominent role, and "this level of the administration depends on politics and on those that select the heads of the administration" (Administration)[207].

This is particularly clear in the case of Niedersachsen, "whose position concerning the construction of a pipeline is well known. This has sometimes constrained the room for action of my colleague in Niedersachsen" (Administration)[208], since "the local Minister of the Environment has relatively early built a barricade concerning a pipeline in the Weser or in the North Sea. It's a problem, when someone makes such a strong statement and then has to take it back" (Environment)[209].

The discussions show indeed that the pipeline is the one solution most capable of solving the issue. It is nevertheless difficult to assess "what kind of legal and other

[204] Original text: *"Da kann man auch erkennen, dass eben der Einzelne oder die einzelne Person einfach in Zwängen sitzt und sagt, das kriege ich politisch einfach nicht durch"*.
[205] Original text: *"Dass man da Menschen hat, die sich unterschiedlich stark bewegen können"*.
[206] Original text: *"Der RT kann ja nichts bestimmen (...), sondern wir haben ja nur die Aufgabe, die politischen Gremien zu beraten"*.
[207] Original text: *"(...) dass diese Verwaltungsebene natürlich auch von der Politik lebt und von denjenigen die letztlich den kopf der Verwaltung stellen"*.
[208] Original text: *"Die Position Niedersachsens bei der Frage des Baus einer Pipeline… die ist sehr bekannt und das hat natürlich manchmal die Handlungsspielräume meiner Kollegin in Niedersachsen auch eingeschränkt"*.
[209] Original text: *"(...) dass der dortige Umweltminister schon relativ frühzeitig eine Blockade aufgebaut hat, im Bezug auf Fernrohrleitung in die Weser oder in die Nordsee. Das ist natürlich jetzt auch ein Problem wenn jemand, der so eine klare Aussage gemacht hat, von dieser Aussagen abrücken muss"*.

hurdles we'll have to take into account, because in the political space of Niedersachsen there are apparently significant problems with approaching this idea in a constructive manner" (Industry)[210].

Given the above discussion on "flexibility" and actual possibilities of changing one's position, a similar situation raises a major concern on the chance of achieving a consensual arrangement without political representatives at the RT – point in case: the head of the Ministry of the Environment of Niedersachsen. The respective representative at the RT "has several problems because her minister all of a sudden sees things in a politically different way. One can see that the technical arguments have had an effect on this representative. We have political restrictions there, though" (Industry)[211].

If political restrictions do not depend on technical arguments, what do they depend on? For some "politics is a process, and the most important thing about politics is that it changes" (Industry)[212]. The approaching of elections seem to play a role, as "in the meantime we had elections in Hessen, we will soon have them in Thuringia, we will soon have national elections and everybody is a bit careful there" (Administration)[213].

What is interpreted as being careful here, is elsewhere seen as a certain degree of arbitrariness, populism and opportunism: "I have often made the experience in the political business that a politically sensible legislative process is aborted because of some ongoing elections somewhere" (Industry)[214]. That is a matter of "populism. (…) To bring these people down from their horses is, I believe, the main problem for the findings of the RT to be brought into politics and into the population" (Industry)[215].

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[210] Original text: *"Habe ich ja keine Vorstellung, mit welchen rechtlichen und sonstigen Widerstände da zu rechnen ist, also, dass jetzt im politischen Raum Niedersachsen offensichtlich noch erheblich Probleme hat diese Gedanken sich konstruktiv zu nähern"*.

[211] Original text: *"(…) etliche Probleme, weil Ihr Minister das jetzt politisch anders einsieht. Aber, man erkennt schon dass die Sachargumente bei dieser Vertreterin des Landes doch nicht ohne Wirkung geblieben sind. Aber da sind dann die politischen Restriktionen"*.

[212] Original text: *"Politik ist auch ein Prozess (…) Das ist das Wesentliche an der Politik, dass sie sich bewegt"*.

[213] Original text: *"(…) wir hatten Landtagswahl in Hessen, zwischenzeitlich, wir haben bald Landtagswahlen in Thüringen, wir haben bald Bundestagswahl und da sind, ich glaube, alle etwas vorsichtig"*.

[214] Original text: *"Ich habe auch im politischen Geschäft sehr oft erfahren, (…) wie schnell die irgendwo durch eine Wahl die grad läuft, eine sinnvolle politische Geschichte im Gesetzgebungsverfahren einfach kassiert wird"*.

[215] Original text: *"Das ist dieses Populismus und ich (…glaube…) solche Leute von ihrem Pferd wieder runterzuholen, das ist glaube ich überhaupt das Hauptproblem, wie die Erkenntnisse des RTs in die Politik und in die Bevölkerung reinkommen"*.

A4.1.3.6. Relationship

The "Relationship" header gathers references to the way participants have dealt with one another before and during the process. This point is all but secondary since "the RT has been established one and a half years ago out of a heavily cramped situation, (out of) the need for resolution and alleviation and softening of the tone of the discussion" (Administration)[216]. Goal was thereby to "put the discussion on an objective basis, to de-emotionalise it (…) and to create the conditions to restore a bit of peace in the region" (Administration)[217], moving "away from confrontation and approaching things objectively" (Industry)[218].

The achievement of consensual arrangements is indeed seen as dependent on the ability of the involved parties to interact at a lower level of confrontation. That simply won't be possible "If we cannot talk to one another, if we insult one another, if we always insinuate that one doesn't want the common good but only pursues one's own interest, as you could read in the press one year ago. (…) That we can work together, that we can talk together, that we can achieve fruitful results together is something that nobody could have really imagined back then" (Administration)[219].

The reference to the "common good" is interesting if read against what said above on interests and positions. Each group has clearly defined individual interests and little is to be done about it. These interests are for the common good, though. The RT has apparently made a difference there. Things happened that put it at risk, such as the presentation of the Measures Package by K+S as a *fait accompli*: "Precisely there I have seen it as my task to say: (…) either we work constructively and trustworthily together or we don't work" (Environment)[220]. Along the process, at the time of the first round of interviews, the attitude had however changed, since "the most important thing of these processes in general is that participants change along the way".

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[216] Original text: *"Der RT ist entstanden vor anderthalb Jahren aus einer sehr verharrten Situation heraus, (…aus einem…) Bedürfnis nach Lösung und Entspannung (und) Entkrampfung der Diskussion"*.
[217] Original text: *"(um die) Diskussion, auf eine sachliche Grundlage zu stellen, zu entemotionalisieren und (...) damit die Voraussetzung dafür zu schaffen, dass in der Region wieder ein Stück Frieden einkehrt"*.
[218] Original text: *"Weg von der Polemik, sondern wirklich mit Sachlichkeit zukommen"*.
[219] Original text: *"Wenn wir miteinander nicht reden können, wenn man miteinander schimpft, mit dem anderen immer unterstellt, dass er nicht das gute wollte, sondern nur das eigene Interesse vertreten wollte wie es in der presse vor anderthalb Jahre zu lesen war. (…) Dass man miteinander arbeiten kann, miteinander reden kann, miteinander fruchtbare Ergebnisse erzielen kann, das hat sich damals keiner vorstellen können"*.
[220] Original text: *"Genau da habe ich meine Aufgabe darin gesehen, zu sagen: (...) entweder arbeiten wir konstruktiv und vertrauensvoll zusammen oder auch nicht"*.

Given the above on expectations and "flexibility"[221], we'd rather read the point on change with reference to the personal attitude of the representatives, at least as individuals: "when you sit so many hours in front of the same faces, you start to recognize not only the faces but also the minds behind the faces. Partly also the human aspects that shape these faces" (Industry)[222].

Getting to know one's counterpart as an individual creates mutual understanding, and thus "one understands what they are ready to do and what they are not ready to do" (Administration)[223], with the effect that "when you know more about one another, you are more ready to find common solutions. We have developed mutual understanding" (Administration)[224]. This has brought about first of all a change of attitude within and towards K+S: "concerning K+S, the mood was still quite tense one year ago (…). This has changed as well and when one side changes, in most cases the other side changes too, because it has the chance to deal with its counterpart in a different way" (Administration)[225].

The way the relationship has changed is "that one can discuss more freely. That criticism can be raised and that those being criticised, K+S for example, react more calmly and answer more clearly. Trust has improved (…), it's still not total, though" (Environment)[226]. Indeed, "in the course of such a process, a good deal of confidence has come about in raising arguments towards people that otherwise you would have tout-court approached differently. One knows how to be supportive towards someone else and how to say: 'This is not ok'" (Industry)[227].

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[221] See the passage on Motivation (Generalised) in the subsection on Other Topics in the present subsection.
[222] Original text: *"Wenn man viele Stunden mit im wesentlichen den gleichen Gesichtern dann sitzt, erkennt man nicht nur die Gesichter, sondern auch die Hirne die hinter den Gesichtern sind. Zum Teil auch das allgemein Menschliche, was die Gesichter ausprägt"*.
[223] Original text: *"(...) man lotet sozusagen ihre Bereitschaften aus"*.
[224] Original text: *"Wenn man mehr voneinander weiß, ist man mehr bereit, Lösungsansätze gemeinsam zu finden. (...) Ja, man hat mehr Verständnis entwickelt"*.
[225] Original text: *"Die Stimmung war durchaus, was K+S angeht, vor eineinhalb Jahre doch noch sehr gereizt (...). Das hat sich ja auch geändert, und wenn sich eine Seite ändert, dann ändert sich ja meistens auch die andere Seite, weil sie die Chance hat, mit einem Partner anders umzugehen"*.
[226] Original text: *"(...), dass freier diskutiert wird. Dass Kritik ausgesprochen wird und diejenigen, die dann kritisiert werden, beispielsweise K+S, da oft ruhiger darauf reagiert und klarer darauf antwortet. (...) Es hat sich verbessert die Vertrauenslage aber vollständig ist sie noch nicht"*.
[227] Original text: *"Im Laufe einer solchen Prozesses ist auch ein gutes Stück Vertrauen in die Argumentation gegenüber Menschen eingetreten, die man normalerweise so ein bisschen blockhaft anders eingeordnet hätte. Man weiß, wie man selber dann, wie man ein anderer zustimmen kann, oder wem man sagen kann, dass geht so gar nicht"*.

In the eyes of the interviewees, "it is certainly so, that from an initially sometimes confrontation-laden discussion, an objective discussion often became possible" (Environment)[228]. In that sense, "the discussion taking place today is of a different quality. There is no confrontation" (Administration)[229]. Instead, "I have to say that after the 6th or 7th meeting I felt much more at ease" (Industry)[230], "I had all the time the feeling I was being taken seriously, from all sides". (Environment)[231]. This seems to imply, "that one acknowledges the opinion of the other, (acknowledging also) that one is seriously interested in finding a solution which is adequate to both sides" (Industry)[232].

A4.2. Interviews: 2nd Round

Table A4.2 presents the topics characterising in the interview materials and the number of interviews in which they appear (N=13).

[228] Original text: "Es ist sicherlich so gewesen, dass aus der vielleicht anfangs manchmal konfrontativen Diskussion oft dann eine sachliche Diskussion möglich wurde".
[229] Original text: *"Insofern ist die Diskussion von einer anderen Qualität, die heute stattfindet. die ist nicht konfrontativ"*.
[230] Original text: *"Da muss ich sagen, nach dem 6. oder 7. Sitzung habe ich mich da auch wesentlich wohler gefühlt"*.
[231] Original text: *"Ich habe mich ständig ernst genommen gefühlt, von allen Seiten"*.
[232] Original text: *"Dass man auch die Meinung des anderen anerkennt, und auch dem anderen (anerkennt), dass er ernsthaft daran interessiert ist eine Lösung zu finden, die beiden Seiten gerecht ist"*.

Topic/Code	f	Percentile
Criteria	1,00 (13)	
Pipeline	1,00 (13)	>90-Percentile (0,92)
Consensus	0,92 (12)	
NIS	0,92 (12)	
Stahl	0,92 (12)	
Pre-vote	0,92 (12)	
Solution RT	0,77 (10)	
Niedersachsen	0,77 (10)	
Postponement of the vote	0,77 (10)	
Legal/administrative	0,69 (9)	
Relationship between measures	0,69 (9)	>75-Percentile (0,62)
Effects on the North Sea	0,62 (8)	
K+S	0,62 (8)	
Solution K+S	0,62 (8)	
Intermediate solution	0,62 (8)	
Abatement/avoidance	0,62 (8)	
Expert assessment	0,54 (7)	
Politics	0,54 (7)	
Management of the underground	0,46 (6)	
Motivation	0,46 (6)	
Recommendation	0,38 (5)	
Watershed quality	0,38 (5)	
Public/Communication	0,38 (5)	
Technical possibilities and limits	0,38 (5)	
Cooperation between agencies	0,38 (5)	
EuWFD	0,31 (4)	
Trade-off	0,31 (4)	
Authority	0,23 (3)	
Intervention on nature	0,23 (3)	
Costs	0,23 (3)	
Cost distribution	0,23 (3)	
Production phase-out	0,23 (3)	
Results to present	0,15 (2)	
Success chances RT	0,15 (2)	
Salt heaps	0,15 (2)	
Nuisance displacement	0,15 (2)	
Work atmosphere	0,08 (1)	
Jobs	0,08 (1)	
Effects	0,08 (1)	
Contribution of the RT	0,08 (1)	
Present damage/effects	0,08 (1)	
Communication	0,08 (1)	
Sustainability	0,08 (1)	
New knowledge	0,08 (1)	
Ratio Product/Waste	0,08 (1)	
Objectivisation	0,08 (1)	

Table A4.2 – Relative frequencies of the topics referred to in the 2nd Round of interviews.

Absolute frequencies in parentheses.

We can find topics directly mentioned by the interview guidelines in the upper percentiles. As explained above, some are redundant and can be left aside, such as

"Stahl", "Pre-vote", "Postponement of the vote". We have a clear account of the events through the minutes. All other topics above the 75th percentile provide a rather homogeneous picture, in which we can read: 1) the characterisation of the measures under consideration ("Pipeline"; "NIS"; "Relationship between measures"); and 2) the terms and conditions preluding to the recommendation ("Consensus"; "Solution RT"; "Niedersachsen"; "Legal/administrative"). We will approach the materials accordingly, after spending a few words on the "Criteria" topic. The criteria extracted from the interviews are presented in Table A4.3.

Macro-category	No.	Criteria
Impacts of current salt disposal	1	Infrastructure
	2	North Sea
	3	Underground
Goals of measures	4	No emissions
	5	Target Werra, Weser, Underground and salt heaps
	6	Watershed quality
	7	No disposal in the underground
	8	No displacement
	9	Maximal local disposal
	10	Realistic effectiveness of measures
	11	Address further nuisances (beside salt)
	12	Buffer capacities
Impacts of measures	13	Underground
	14	Nature and landscape
	15	Energy
	16	Drinking water provision
	17	Life cycle of measures
	18	Environmentally friendly disposal of unavoidable wastewaters
Time	19	Urgency
	20	Durable disposal solutions
	21	Implementation time frame
	22	Short term improvements
	23	Mid-term good ecological status
	24	Nature-like conditions by 2020
	25	Durable solutions
Legal/administrative	26	Legal deadlines
	27	Likelihood of approval
	28	Political approval/support
	29	New (lower) thresholds
	30	Realistic implementation
	31	Compatibility with current water law
	32	Interim solutions conditioned to pipeline

Macro-category	No.	Criteria
Economic	33	K+S budget
	34	Continuity of production
	35	Production phase out
	36	Production/Waste ratio
	37	Sensible investments
	38	Profitability of the measures
	39	Profitability of production
Social	40	Employment
Procedural	41	Risk/scientific assessment
	42	Assessment of all options

Table A4.3 – Criteria mentioned in the 2nd round of interviews.

What we see is that the criteria in Table A4.3 overlap almost entirely with the ones extracted from the first round of interviews. This is consistent with the above findings on the limited "flexibility" of the representatives at the RT (see in this appendix "Motivation (generalised)" and "Politics" in A4.1.3.4. and A4.1.3.5. respectively). Furthermore, the matter of criteria shaping the decision will be dealt with at length in Chapter 5. We will therefore save space here and concentrate on the elements that truly characterise the materials coming from the second round of interviews.

A4.2.1. The measures under consideration

At this stage, the discussion concerning the recommendation involves two core elements: the North Sea pipeline and the "NIS" or New Integrated Salt Management. The interviews give us clues on how the RT Members see them. Furthermore, pipeline and NIS add on a series of further local abatement measures introduced early on in the process through the Measures Package by K+S. At this point in time K+S is formally bound to these latter bundle of measures, so they are not object of deliberation any more. They do appear in the interviews basically in the light of how pipeline and NIS relate to them.

Indeed, the very starting point is that the Measures Package is per se not conducive to ecological improvements in the Werra. Its effects are offset by the end of the underground disposal practice, so that the expected result is a concentration in the

near of the ex-ante 2.500 mg/l, possibly even higher. The package ideally exhausts the technical possibilities for local disposal, so that only extra-local, transport-based solutions remain for consideration, "and there, the ecologically more sensible thing to do, after all the things technicians have shown us, is to go as far out in the sea as possible. A pipeline, then" (Industry)[233].

Interviewees maintain that "a solution of the overall problem is only possible via a pipeline to the North Sea" (Administration)[234]. The pipeline solution has "the big advantage not to dispose of a lot of salt-rich wastewater, which currently goes into the Werra and into the underground, into a freshwater river. In the mid term, it allows for a salt-free freshwater river over a length of more than 400km" (Environment)[235]. "In this sense, we have a series of possibilities to improve the situation. Then, we have a solution that could fundamentally improve the situation. That is the pipeline" (Administration)[236]. Which appears as "the only option to solve this problem in a durable way" (Administration)[237].

In the eyes of some interviewees, the pipeline does more than solving the salinity problem of Werra and Weser: "one could connect several other potash extraction facilities. (…) That would be very convenient and one could contribute financially. K+S does not have to bear the whole thing" (Environment)[238]. Furthermore, "with a pipeline, jobs are safe until the end of the extraction activities in the region, once and for all" (Environment)[239] and both the salt heaps and their salt-rich runoff have a channel for disposal beyond the operations of K+S.

In the eyes of the interviewees, this latter point also explains part of the opposition of K+S to the pipeline: with it, "when production in Hessen and Thuringia is over, K+S

[233] Original text: *"Und da ist das ökologisch Sinnhafteste, nach all dem was die Fachleute uns dargelegt haben, möglichst weit raus auf die See. Eine Fernleitung also"*.
[234] Original text: *"Eine Lösung des Gesamtproblems ist nur über eine Fernleitung an die Nordsee möglich"*.
[235] Original text: *"Der große Vorteil an der Fernleitung ist, dass man eine große Menge Salzabwasser, die bisher in die Werra und denen Untergrund eingeleitet wird, nicht mehr in den Süßwasserfluss kippt, dass der Süßwasserfluss mittelfristig salzfrei wird und das über 400km Länge"*.
[236] Original text: *"Insoweit haben wir optional eine Reihe von Möglichkeiten, die Situation zu verbessern. Dann, wir haben eine Lösung, die das Grundlegend das verbessern könnte, das ist die Fernleitung"*.
[237] Original text: *"Die einzige Option überhaupt, nachhaltig dieses Problem lösen zu können"*.
[238] Original text: *"An dieser Fernleitung, wenn das jetzt gebaut wird, (...könnte man...) verschiedene andere (...) Kaliwerke anbinden (...). Das wäre doch ne feine Sache. Da konnte man sich finanziell auch beteiligen und nicht die ganze Last K+S schultern lassen"*.
[239] Original text: *"Bei der Fernleitung werden bei K+S die Arbeitsplätze bis zum Ende der Ausbeutung des Reviers endgültig gesichert"*.

remains obliged to bear at least part of the follow-up costs" (Environment)[240]. As a matter of fact, the pipeline has objectively negative aspects too, since "basically everybody wishes to take the salt load under control without the pipeline and without the dislocation to the North Sea. All assessments have shown (…) that it's not possible (…). That's why the last chance is this pipeline. We presently have no real alternative" (Administration)[241]. And that is "expensive, burdensome, lengthy. We count on time frames of eight to ten years before it's operative" (Environment)[242].

The time frame is a key element in contrasting NIS and pipeline: "the former is an economically interesting approach, (…) feasible in the short run and economically bearable. The other one is more of a long-term solution" (Industry)[243]. The NIS promises the possibility "that the facilities continue with the production and that wastewaters can be disposed of" (Industry)[244] right after the dismissal of the injection practice. In the eyes of the interviewees, the NIS constitutes however "some sort of intelligent injection" (Environment)[245] promising to "temporarily store a big quantity of wastewater" (Environment)[246].

Under this scheme, Werra and Weser remain however in their role of disposal channels since "NIS also means that you keep disposing for 1.700 mg/l" (Riparian)[247]: With 7 million m^3 wastewater, (…) that is not the end of the problem" (Administration)[248]. Given its close relationship with the injection practice, the NIS is even more problematic in the light of the its legal profile: "Thuringia sees the NIS

[240] Original text: *"Wenn die Produktion im hessisch-thüringischen Revier beendet ist, bleibt K+S hier weiter in der Pflicht, mindestens ein Teil der Folgekosten mittragen zu müssen bei der Fernleitung"*.
[241] Original text: *"Im Gründe genommen wünschen alle, dass man die Belastung ohne eine solche Fernleitung und Verlagerung in die Nordsee hinkriegen könnte. Alle Untersuchungen die der RT veranstaltet hat haben gezeigt, dass es (...) nicht geht (...). Deswegen ist die Ultima Ratio diese Fernleitung und wir haben bis heute keine einzige, wirkliche Alternative dazu"*.
[242] Original text: *"Das ist teuer, aufwändig, langwierig. Wir gehen von Zeiten aus, in acht oder zehn Jahren, bis man das betriebsbereit hat"*.
[243] Original text: *"Die eine ist die wirtschaftlich interessantere Geschichte (...). Die ist kurzfristig machbar und auch schulterbar. Das andere ist die langfristigere Lösung"*.
[244] Original text: *"(...) dass der Standort dann auch weiter produzieren kann, und dass die Laugenwässer entsorgt werden können"*.
[245] Original text: *"Eine Art intelligente Verpressung"*.
[246] Original text: *"(...) dass man da eine große Menge an Salzabwasser zwischenlagern kann"*.
[247] Original text: *"(...) weil NIS bedeutet (...), dass man weiter 1.700 mg/l einleitet"*.
[248] Original text: *"Weiterhin würde das bedeuten, dass mindestens noch 7 Millionen Kubikmeter Abwasser(...) eingeleitet werden (...). Das ist nicht die Lösung des Problems"*.

rather critically" (Industry)[249], so that "in the long run it does not seem likely to obtain an authorisation" (Administration)[250].

Which role does the NIS play, then? "I am deeply convinced that the NIS is just an interim possibility until the pipeline is completed" (Administration)[251] consisting of basically "nothing else than injection with the old means, maybe propped up and maybe a bit more safe here and there. It's no fundamentally new channel of disposal" (Administration)[252]. In that sense, the two measures NIS and pipeline appear complementary rather than alternative. Certainly their mutual relationship is complex.

On the one hand, interviewees maintain "that the one does not replace the other" (Industry)[253], "It's more of a first-and-then" (Industry)[254], "clearly not either/or but, if at all, then both" (Administration)[255]. On the other hand, finances hardly seem to allow both components, since "K+S has already announced, if they realise the NIS (and they would like to), they do invest several million EUR (…), but they would do it only if they don't have to build the pipeline. The other way around, if they make the pipeline, they don't do the NIS" (Environment)[256]. In that sense, they are indeed alternative, mutually exclusive options, at least from a financial point of view.

Some expect, "that the RT will unanimously say: 'the NIS is not acceptable, but we have to find other local measures' and then we are going in circles with what we just discussed" (Administration)[257]. Indeed some maintain that "we should first of all do as much as possible locally so as to reduce the salt load" (Administration)[258]. And then "what else can we do? The only possibility would be the NIS since they haven't

[249] Original text: *"Die NIS ist aus thüringischer Seite durchaus kritisch beurteilt worden"*.
[250] Original text: *"(…dass...) die NIS langfristig gar nicht genehmigungsfähig erscheint"*.
[251] Original text: *"Die NIS ist nach meiner festen Überzeugung, nur eine Möglichkeit, die Zwischenzeit bis zum Stellen der Fernleitung zu überbrücken"*.
[252] Original text: *"(...) nichts anderes als die Versenkung mit alten Mitteln, vielleicht noch aufgepeppt und vielleicht hier und da ein bisschen sicherer aber eben nicht sozusagen als grundsätzliches Entsorgungspfad"*.
[253] Original text: *"(...) dass die eine die andere nicht ersetzt"*.
[254] Original text: *"Es ist eher ein erst-und-dann"*.
[255] Original text: *"(...) ganz klar kein Entweder-Oder, sondern wenn dann nur sowohl-als-auch"*.
[256] Original text: *"K+S hat schon angekündigt, falls sie die NIS machen (und das würden sie gerne), dann tun sie da wohl einige Millionen Euro investieren (...), aber dann würden sie es machen wenn sie keine Rohrleitung machen müssen. Umgedreht: wenn sie die Rohrleitung machen, machen sie keine NIS"*.
[257] Original text: *"Ich gehe aber davon aus, dass der RT wohl einhändig sagen wird: NIS ist nicht akzeptabel, aber es müssen andere Maßnahmen vor Ort ergriffen werden, und da drehen wir uns wieder im Kreise mit dem was wir grade diskutiert haben"*.
[258] Original text: *"Man soll möglichst zunächst alles machen, was vor ort getan werden kann um die Belastung zu verringern"*.

shown us further abatement possibilities at the moment" (Environment)[259]. Besides, "a pipeline always needs a steering possibility" (Environment)[260], which the NIS could offer, at least from a theoretical point of view. In this sense, the NIS seems to find a rationale in exhausting local abatement possibilities, with or without reference to the long construction time of the pipeline.

A4.2.2. Terms and conditions for a recommendation

The relative weight between NIS and pipeline constitutes the terms of discussion. "The majority of the RT has developed proposals, that could lead to an effective relief if implemented correctly in time and space" (Administration)[261] and they are to be understood "as an overall package, and that includes the pipeline" (Environment)[262]. The perspective is hence that "in our recommendation, I'm quite convinced of it, the pipeline to the North Sea will be at the first place. This has to be built. It has to be verified straight away and then the construction can begin. For the time being, everything has to go onto the heaps" (Environment)[263].

In the eyes of the interviewees, "a vast proportion (of RT Members) will support the option of a maximal local abatement and a pipeline to the North Sea" (Environment)[264], implying that "emissions will continue until we get to the big solution" (Administration)[265]. Here, some maintain that, for those emissions to stay within acceptable limits, "we need the NIS until the pipeline is not only approved but also realised" (Industry)[266]. Others, instead, believe that "measures achieve no fundamental abatement but rather two or three tons here and maybe one million

[259] Original text: *"Was kann man noch machen also? Es wäre dann wahrscheinlich nur diese NIS noch möglich, weil im Moment keine andere Maßnahme aufgezeigt worden ist, mit der man eben mehr vermeiden kann"*.
[260] Original text: *"Aber das braucht natürlich immer bei einer Rohrleitung auch ne Steuerungsmöglichkeit"*.
[261] Original text: *"Der RT hat mehrheitlich Vorschläge entwickelt, die zu einer wirksamen Entlastung führen könnten, wenn sie dann in Zeit und Raum richtig eingesetzt werden"*.
[262] Original text: *"(...) als Gesamtpaket und inklusive der Fernleitung"*.
[263] Original text: *"(...) in unserer Empfehlung, da bin ich sehr überzeugt, wird die Fernleitung an die Nordsee als erstes genannt werden, die zu bauen ist, und zwar sofort das zu prüfen und dann kann die Option des Bauens beginnen und solange muss alles auf Halde gemacht werden"*.
[264] Original text: *"Ich glaube, dass ein überwiegender Teil diese Variante maximale Vermeidung vor Ort und Pipeline zur Nordsee zustimmen wird"*.
[265] Original text: *"(...) und dann leitet man halt eben noch so lange ein, bis man tatsächlich zur großen Lösung kommt"*.
[266] Original text: *"NIS brauchen wir so lang bis die Fernleitung nicht nur entschieden sondern auch gebaut worden ist"*.

cubic meters wastewater there. I believe, if you build a pipeline this optimisation is not strictly necessary any longer" (Administration)[267].

These are however no fundamental problems compared to the opposition of K+S and Niedersachsen: "everybody else is convinced that the pipeline must come. K+S was standing alone with its unconditional preference for the NIS" (Administration)[268]. On this K+S has "very little support. Even internally people are not so convinced" (Environment)[269]. Here, we can see through the eyes of the interviewees how the process evolved in the third phase: "in August/September, a rather large majority at the RT was of the idea that the pipeline is the solution, and now the NIS by K+S comes into the game as an alternative. I believe it has other causes, probably a purely economic one… how the company puts the money together for the pipeline" (Industry)[270].

At this stage, the NIS seems not to be in the position to constitute a viable alternative, at least not in the way K+S counts on it "as an effective long term solution, so that the Weser system holds on to an exploitation of the underground, which now K+S intends to slightly change with the NIS" (Administration)[271]. This is seen as legally problematic, since "Hessen believes that, at the present state of things, the underground cannot be exploited over longer periods of time any more. Instead this can only be possible as a interim solution until the goals are achieved. This is a matter of water law" (Administration)[272].

Matters of legal compatibility have played an important role throughout the whole process, as we have seen while exploring the minutes (Subsection 4.2.2.2.). They do so with even more emphasis in this latter phase of the process. "Today's legal

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[267] Original text: *"Wieder bringen die Maßnahmen ja keine entscheidende Verringerung, sondern da mal vielleicht zwei, drei hundert Tonnen oder da vielleicht mal ne Million Kubikmeter Abwasser, aber ich denke: diese Optimierung wäre bei einer Salzleitung nicht mehr zwingend"*.
[268] Original text: *"Alle andere (sind) der Überzeugung, die Salzleitung muss kommen (…). Da stand K+S mit seiner uneingeschränkten Bevorzugung der NIS als Alternative, doch ziemlich alleine da"*.
[269] Original text: *"K+S (…hat…) aber wenig Mitstreiter die das unterstützen. Selbst in den eigenen Reihen sind da die Leute nicht so überzeugt"*.
[270] Original text: *"Der RT war ja mal in August/September (…) ziemlich mit großer Mehrheit der Meinung, die Pipeline wäre ja die Lösung, die empfohlen wird, und jetzt ist die NIS von K+S jetzt mit ins Boot gekommen, als Alternative genannt wurde. Ich denke das hat andere Ursachen, wahrscheinlich eine reine wirtschaftliche (Erklärung)... wie das Unternehmen wirklich die Mittel aufbringen kann, eine Leitung zu bauen"*.
[271] Original text: *"(…) als eine langfristig wirksame Lösung einsehen, so dass da das Wesersystem wird aber an einer Grundwasserbewirtschaftung festhalten, die sie aber mit dieser NIS etwas ändern will"*.
[272] Original text: *"Hessen hat die rechtliche Auffassung, dass ohne weiteres überhaupt nicht über längere Zeiträume die Benutzung des Grundwassers noch erlaubt werden kann, sondern (…) nur noch als Übergang, bis man dort ankommt bei den Zielen. Das hier tut sich aus dem Wasserrecht"*.

framework requires at this point improvements through the Werra for the groundwater and in the end for the Weser for the sake of the downstream communities" (Administration)[273]. "Water law requires a minimisation of the salt load" (Administration)[274], which preludes to the fact that "thresholds will not be extended any more" (Industry)[275].

The legal nexus attaches rather strongly to the presence, both as initiators and as Members of the RT of the upstream states of Thuringia and Hessen, who, in the worst case, "will have to face the obligation to thoroughly justify every target that they were not able to meet" (Environment)[276]. Concerning waste disposal, "water law sets strict and even stricter limits, so that one has to deal with it. I don't think it's good, but I think it's unavoidable" (Administration)[277], putting the state administrations "in a clearly dominant role, because three state administrations sit at the RT which eventually have the decision power over complaints, deadlines and thresholds" (Industry)[278].

As their power come with a degree of responsibility, state administrations seem to be in a difficult position concerning the overall RT process. Some interviewees stress the pressure they are subject to: "it's about time for them to move on with the authorisations and with the emission deadlines (…). They have their deadlines in mind and legal assessments available. They are more under pressure than they used to be one and a half year ago" (Riparian)[279].

The pressure is connected to possible litigation cases. Prior authorisations are already under legal scrutiny: "a municipality has taken legal action against the emission authorisation at the territorial authority. It requests the withdrawal of the authorisation for emission and underground injection from the authority in Kassel. There is a need to clarify the state of things here, possibly in a written form"

[273] Original text: *"Die heutige Rechtslage erfordert, dass man an dieser Stelle zu Verbesserungen über die Werra für das Grundwasser und letztlich auch zugunsten der Unterlieger für die Weser kommt"*.
[274] Original text: *"Das Wasserrecht verlangt eine Minimierung der Belastung"*.
[275] Original text: *"Es werden Grenzwerte nicht mehr verlängert"*.
[276] Original text: *"Und das steht natürlich als Pflicht der Länder auf dem Programm, dass sie jede Zielerreichung die Verfehlt wird ausführlich begründen müssen"*.
[277] Original text: *"Da setzt das Wasserrecht enge und engste Grenzen, dass man das in Anspruch nehmen muss. Ich finde das gar nicht gut aber ich finde es unvermeidlich"*.
[278] Original text: *"Das ist ganz klar, dass sie eine dominierende Rolle einnehmen, weil drei Ländervertreter am Tisch sitzen, die am Ende auch Entscheidungsbefugnis haben für Klagen, für Fristen, für Grenzwerte"*.
[279] Original text: *"Die müssen ja langsam mit der Genehmigung und der Einleitungsfristen vorankommen. (…) Die haben ja Ihre Fristen vor Augen und Ihre (…rechtliche…) Gutachten, die vorhanden sind. Da ist so dass sie mehr unter Druck stehen als vor anderthalb Jahren"*.

(Industry)[280]. Relying on injection, the NIS is very likely to follow the same path "and possibly it will be decided later on by the court, if it's ok" (Administration)[281].

Nonetheless, "K+S insists on the NIS and then no pipeline would be necessary. It's not that they rule it out, but they don't see the need for it. The authorising agencies says however that they are not going to authorise it. K+S thus proposes a solution that cannot be implemented because it's not compliant with the regulations" (Environment)[282].

Another seemingly puzzling element is the position of Niedersachsen: "If you look at it, Niedersachsen has other interests, because the longest segment of the pipeline goes through Niedersachsen and the North Sea belongs to it as well" (Industry)[283]. For both present a past solutions "in Niedersachsen [… there are …] only the negative effects" (Environment)[284]. In this sense, it comes to no surprise that "Niedersachsen has the biggest interest that as much abatement as possible takes place locally" (Industry)[285]. The Measures Package and possibly the NIS exhaust the possibility for local disposal and yet they do not solve the problem – this is exactly what Niedersachsen does not acknowledge.

"At the moment, the Minister for the Environment of Niedersachsen says that everything has to be avoided or abated locally and that no emission shall be allowed in any river" (Riparian)[286]. Specifically, "something is postulated about what has to be done, but they have nothing to say when we talk about the details" (Administration)[287], nor is the opposition to the pipeline clearly articulated: "Sometimes, I take the arguments against the pipeline for quite philosophical.

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[280] Original text: *"Eine Gemeinde klagt gegen die Einleitungsgenehmigung beim Regierungspräsidium, fordert die Rücknahme der Einleitungsgenehmigung und der Versenkungsgenehmigung beim RP Kassel und… Da ist noch Bedarf, die Verhältnisse in einer klaren und vielleicht in schriftlicher Form darzustellen"*.
[281] Original text: *"Möglicherweise wird das nachher erst doch vor dem Gericht entschieden, ob das in Ordnung ist"*.
[282] Original text: *"Im Moment sagt K+S: sie wollen weiter auf die Salzlaststeuerung setzen und dann wäre keine Rohrleitung notwendig. Sie schließen das zwar nicht kategorisch aus, aber die sagen erst mal sehen sie da nicht den Bedarf. Die Genehmigungsbehörde hat angedeutet, dass eine Salzlaststeuerung nicht genehmigt wird. Damit sozusagen schlägt K+S eine Lösung vor, die nicht umgesetzt werden kann, da sie nicht Genehmigungsfähig ist"*.
[283] Original text: *"Wenn man das sieht, Niedersachsen hat andere Interessen, da die längste strecke der Pipeline durch Niedersachsen gehen müsste und weil die Nordsee zu Niedersachsen gehört"*.
[284] Original text: *"In Niedersachsen kann man ja sagen, [... gibt es ...] nur die negativen Wirkungen"*.
[285] Original text: *"Niedersachsen hat da das große Interesse, dass möglichst viel erst mal vor ort entsorgt wird"*.
[286] Original text: *"Im Augenblick ist es so, dass der Minister in Niedersachsen sagt: alles soll vermieden/vermeiden werden und keine Einleitung in kein Fluss"*.
[287] Original text: *"Es wird etwas postuliert, dass etwas gemacht werden muss, aber wenn es dann in die Details geht, dann wird nichts gesagt"*.

Niedersachsen questions the sensibility of the pipeline and has announced its opposition. I do not quite understand that" (Industry)[288].

Niedersachsen has indeed regularly raised arguments against the pipeline. These arguments focused on alleged detrimental impacts on a long list of items (landscape, protected areas, North Sea, Wadden Sea, energy consumption, cattle farming etc.). Expert assessments have regularly dismissed the significance and/or existence of such impacts. This has caused Niedersachsen to raise new arguments, which has in turn led the rest of the RT member to perceive those arguments as strategic and not as real.

RT members are thus in the dark of the real motives of Niedersachsen and can only speculate about them: "for me, the stiff attitude of Niedersachsen is sometimes not comprehensible" (Environment)[289]. "Niedersachsen always says so, because first of all they are the opposition to the pipeline. I believe there may be more nuanced considerations" (Administration)[290]. "Niedersachsen believes that at the end they will bear the main burden of the disposal channel" (Industry)[291]. "They propose no sensible alternative and instead bet on lower environmental standards for Werra and the Weser: rivers are in a bad state, there's not much we have to do" (Environment)[292].

[288] Original text: *"Also ich halte die Widerstände, die manchmal dagegen gehalten werden, für philosophisch. (...) Niedersachsen diskutiert über die Frage der Sinnhaftigkeit der Laugenpipeline und hat dort Widerstand angekündigt, was ich nicht nachvollziehen kann"*.
[289] Original text: *"Für mich ist ja manchmal eine starre Haltung des Landes Niedersachsens nicht nachvollziehbar"*.
[290] Original text: *"Niedersachsen sagen immer wieder, weil sie zunächst Opposition sind gegen der Salzleitung, aber ich denke, da gibt es noch differenziertere Betrachtungen"*.
[291] Original text: *"Niedersachsen ist der Meinung, dass sie am Ende die Hauptlast bei dem Entsorgungsweg tragen"*.
[292] Original text: *"Sinnvollen Gegenvorschlag haben, sondern es läuft darauf hinaus, niedrige Umweltziele festzulegen für Werra und Weser zu setzten, so nach dem Motto: die Flüsse sind halt schlecht, müssen wir nicht mehr viel machen"*.

Appendix 5 – Interview Guidelines

A5.1. First Round (original German text)

Wichtige Anmerkung

Es handelt sich hier *nicht* um ein Fragebogen, sondern um einen Leitfaden. Das Interview ist dementsprechend nicht als Frage-und-Antwort zu verstehen, sondern als Gespräch: der Fragebogen dient dazu, die Kernthemen im Blick zu halten (hier Punkt 1, Punkt 2 und Punkt 3) und bietet jeweils eine Auswahl an Formulierungen die zwar unterschiedlich sind aber das gleiche inhaltliche Ziel haben. Sie sind dementsprechend nicht alle pünktlich und individuell zu beantworten: im Gegenteil soll das angesprochen werden, was sie gemeinsam haben.

Punkt 1: Einleitungsfrage

1.1. Welche Gruppe oder Organisation vertreten Sie am Runden Tisch?
1.2. Sie sind Mitglieder als...? In welcher Funktion vertreten Sie Ihre Organisation?
1.3. Welche (Fach-) Kompetenzen bringen Sie in das Dikussionsgremium ein?

Punkt 2: Ansichten zu Beginn des RTs

Bitte erinnern Sie sich daran, welche Auffassung Sie von der Problematik zu Beginn des Runden Tisches hatten:

2.1. Wie sahen Sie die Problematik damals? Wenn vorhanden, können Sie hier auf die offizielle Stellungnahme Bezug nehmen, die Ihre Organisation zu Beginn der Diskussion am Runden Tisch eingereicht hat.
2.2. Wie sah aus Ihrer damaligen Perspektive eine optimale oder ideale Lösung des Problems aus?
2.3. Was für einen Lösungsansatz haben Sie sich damals vorgestellt?
2.4. Welche Entscheidungsgrößen, direkte und indirekte, waren für Sie relevant, um eine Lösung des Problems herbeizuführen?
2.5. Welche Kriterien waren, Ihrer Meinung nach, wichtig oder sogar unabdingbar für die Bewertung verschiedener Lösungsansätze?
2.6. Welche Akteure hatten Sie als Hauptdiskussionspartner erwartet und was bewegte Ihrer Auffassung nach diese Akteure?
2.7. Im Gegensatz dazu, was bewegte *Sie* zu jenem Zeitpunkt, am Runden Tisch teilzunehmen? Welche Sachfragen waren Ihnen damals wichtig?

Punkt 3: Ansichten zum jetzigen Zeitpunkt

Nehmen Sie nun den jetzigen Stand der Diskussion als Referenz:

3.1. Wie sehen Sie die Problematik heute?
3.2. Was wäre, aus Ihrer Perspektive, eine optimale oder ideale Lösung des Problems?
3.3. Was für eine Lösung des Problems haben Sie jetzt im Blick?
3.4. Welche Entscheidungsgrößen sind Ihrer Meinung nach direkt oder indirekt relevant, um eine Lösung herbeizuführen?
3.5. Welche Kriterien sind, Ihrer Auffassung nach, wichtig oder sogar unabdingbar für die Bewertung unterschiedlicher Lösungsansätze?
3.6. Welche Akteure sehen Sie im Moment im Zentrum der Diskussion? Was bewegt diese Akteure?
3.7. Was bewegt *Sie* heute, an der Diskussion teilzunehmen? Welche Sachfragen sind Ihnen wichtig?

A5.2. First Round (English translation)

Important Notice

This is *not* a questionnaire, it is a guideline for the interview. The interview is not meant as a question-and-answer session but rather as a dialog: the guideline helps us keep the core themes in sight (here Point 1, Point 2 and Point 3) and offers a corresponding selection of formulations. These formulations are indeed different. They all aim at the same contents, though. They are therefore not meant to be answered individually and accurately: to the contrary, the conversation has to focus on what they all have in common.

Point 1: Introduction

1.1. Which group or organisation do you represent at the RT?
1.2. You are a Member of the RT as…? In which function do you represent your organisation?
1.3. Which competences, disciplinary or not, do you contribute to the discussion board?

Point 2: Views at the beginning of the RT

Please try to recollect which views of the issue you had at the beginning of the Round Table:

2.1. How did you perceive the issue back then? If available, you can refer to the official statement your organisation released at the beginning of the discussions at the RT.
2.2. From your point of view at that time, how did an optimal or ideal solution of the problem look like?
2.3. What type of solution did you have in mind then?

2.4. In your opinion, which key dimensions were directly or indirectly relevant in order to bring about a solution of the problem?
2.5. In your opinion, which criteria were important or even necessary for the evaluation of different solutions?
2.6. Which actors did you expect to face as main discussion partners and what are these actors after?
2.7. Instead, what were *you* after in the moment you joined the Round Table? What matters were important to you at that time?

Point 3: Views at present

Please refer now to the current state of the discussion:

3.1. How do you see the issue today?
3.2. From your point of view, how would an optimal or ideal solution of the problem look like?
3.3. What type of solution do you have in mind now?
3.4. In your opinion, which key dimensions are directly or indirectly relevant in order to bring about a solution of the problem?
3.5. In your opinion, which criteria are important or even necessary for the evaluation of different solutions?
3.6. Which actors did you see at the moment as main discussion partners and what are these actors after?
3.7. Instead, what are *you* after, taking part to the Round Table today? What matters are important to you?

A5.3 Second Round (original German text)

Wir setzen hiermit das Gespräch fort, was wir im Sommer angefangen haben. Bitte nehmen Sie nun den jetzigen Stand der Diskussion als Referenz:

4.1. Wie sehen Sie gegenwärtig die Entscheidung am RT?
4.2. Welche Sind die Bestandteile der Abwägung? Was sind die Optionen?
4.3. Was sind ihre gute und schlechte Seiten?
4.4. Wie sehen Sie die Problematik heute?
4.5. Was wäre, aus Ihrer Perspektive, eine optimale oder ideale Lösung des Problems?
4.6. Was für eine Lösung des Problems haben Sie jetzt im Blick?
4.7. Welche Entscheidungsgrößen sind Ihrer Meinung nach direkt oder indirekt relevant, um eine Lösung herbeizuführen?
4.8. Welche Kriterien sind, Ihrer Auffassung nach, wichtig oder sogar unabdingbar für die Bewertung unterschiedlicher Lösungsansätze?
4.9. Welche Akteure sehen Sie im Moment im Zentrum der Diskussion? Was bewegt diese Akteure?
4.10. Was bewegt *Sie* heute, an der Diskussion teilzunehmen? Welche Sachfragen sind Ihnen wichtig?

Zum Schluss hätte ich 2/3 zusätzliche Fragen:

5.1. Wie soll ich die Abstimmung verstehen, die in der Novembersitzung stattgefunden hat? Ich frage Sie besonders im Hinblick auf die hohe Zahl der Enthaltungen. Bei 15 Zustimmungen, 3 Ablehnungen und 6 Enthaltungen könnte sich ein Außenseiter vorstellen, der Prozess wäre gescheitert. Was ist Ihre Interpretation dabei?
5.2. Was für Konsequenzen wird Ihrer Meinung nach das Ausscheiden von Herrn Prof. Stahl haben?
5.3. (Nur für staatliche Akteure) Wie ändert sich Ihre Zusammenarbeit mit weiteren staatlichen Akteuren durch den RT, jenseits des Falls an der Werra?

A5.4 Second Round (English translation)

We now continue the dialogue that we have started in the summer. Please refer to the current state of the discussion:

4.1. What are the terms of the decision the RT faces today?
4.2. What is the object of discussion? What are the options considered?
4.3. What are their good and bad sides?
4.4. How do you see the issue today?
4.5. From your point of view, how would an optimal or ideal solution of the problem look like?
4.6. What type of solution do you have in mind now?
4.7. In your opinion, which key dimensions are directly or indirectly relevant in order to bring about a solution of the problem?
4.8. In your opinion, which criteria are important or even necessary for the evaluation of different solutions?
4.9. Which actors did you see at the moment as main discussion partners and what are these actors after?
4.10. Instead, what are *you* after, taking part to the Round Table today? What matters are important to you?

Before we conclude, I have 2/3 additional questions:

5.1. How shall I understand the voting that took place in the November Meeting? I ask you now and refer in particular to the high amount of abstentions. Facing 15 votes in favour, 3 rejections and 6 abstentions, an outsider could be led to believe that the process has failed. What would be your interpretation?
5.2. In your opinion, what will be the consequences of the withdrawal of Prof. Stahl?

5.3. (Only for state actors) What difference did the RT make for your collaboration with other state actors, beyond the Werra case?