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Report

Analysis of public confidence in scientific results related to northern European estuaries

Executive Summary

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Client

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Background and aim of the study

The Port of Hamburg and the Elbe estuary have been and will continue to be the scene of profound controversies between the interests of industry, local residents and environmental protection. At the center are the plans for the 9th fairway adjustment, which was initiated in 2002 by Hamburg's Ministry of the Economy and the Federal Ministry of Transport - exactly three years after the last deepening of the Elbe was completed (1999). This decision is part of a long history of conflicts at the tidal Elbe.

Scientific findings can mediate in such conflicts and provide a factual basis for discussion. There are numerous studies on the functioning of the Elbe estuary system and on the scientific underpinnings of effects of human interventions, especially fairway adjustments. Four studies will be used in this study which investigates the confidence in scientific reports.

(1) Modeling by the Federal Waterways Engineering and Research Institute (BAW) to forecast the effects of fairway adjustment,

(2) System study II by the Federal Institute of Hydrology (BfG) (with assistance from BAW),

(3) Fish mortality report by the Lower Saxony State Office for Consumer Protection and Food Safety (LAVES).

(4) Smelt I and II expert reports of the Elbe Habitat Foundation.

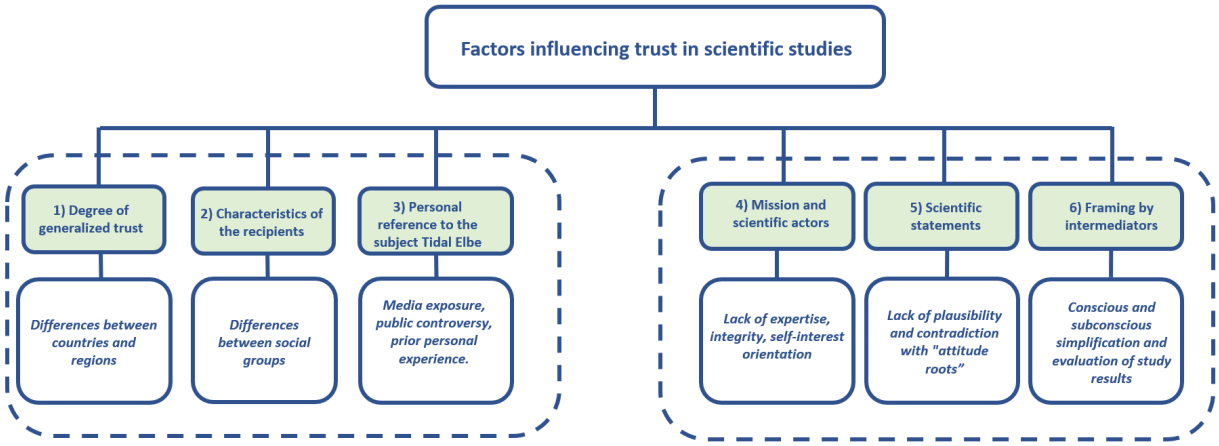
However, these studies have themselves become the subject of ongoing controversy. But what is the reason for the skepticism and mistrust in these scientific studies? It can be deduced from trust and participation research that the Elbe estuary is not a special case. The comparison with the Humber estuary in Great Britain shows that there are similar challenges, but also approaches to solutions for more trust in scientific studies. Exemplary for this is the **Humber Basin River Management Plan** with the corresponding consultation processes *Working Together* and *Challenges and Choices*.

The question addressed in this study is under which conditions do scientific studies in the “Elbe estuary” context have a trust-building effect and where do they reinforce existing mistrust.

Conceptual approach - trust in science in the Elbe estuary context

Based on the current state of research in social sciences, **six groups of factors** can be derived that determine scientific trust **(Fig. 1).**

Figure 1: Factors influencing trust in scientific studies



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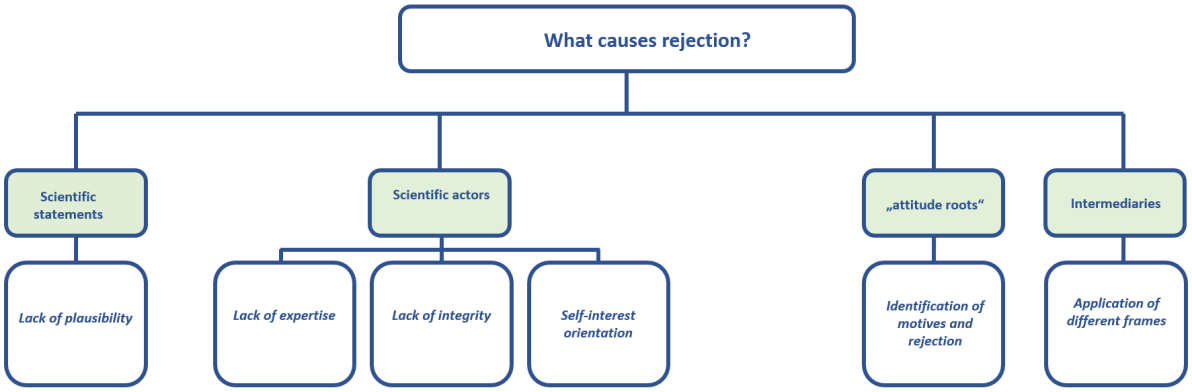
To answer the question of why specific stakeholders are critical of the scientific data and forecasts related to the Elbe estuary, the following factors were investigated: (1) differences between federal states and affected regions, (2) socio-economic and structural characteristics, (3) previous experience and personal relations to the Elbe estuary, (4) characteristics and demeanor of the contracting authorities and scientific actors, (5) the plausibility of the study results, and (6) the framing and dissemination of the results by intermediaries.

The results indicate that distrust is only partly fed by the personal characteristics of the stakeholders, i.e. the first three groups of factors examined. For example, there are no significant differences in generalized trust between Germany and Great Britain. Differences between the federal states along the Elbe estuary in terms of age, education level and disposable income also have little significance.

The last three factors, on the other hand, offer levers for improving the communication of scientific studies and can be used to promote trust in the short term. The study shows that, depending on the composition of the stakeholders, very different arguments can be trust-promoting or unsuccessful. While scientific findings can be sufficiently confidence-building for people who are still new to the Elbe estuary and do not have a present opinion, the same arguments are often not sufficient to dissolve long established skepticism.

Figure 2: Factors influencing trust in scientific studies



Source: own illustration

The reason for distrust of scientific studies in the context of the Elbe estuary is therefore not so much the supposed lack of plausibility of the results, but the options for action derived from them. If these contradict one's own attitudinal roots or if scientists and contracting authorities are perceived as self-interested and lacking integrity, the likelihood that the results of scientific research will be rejected increases (Fig. 2). Intermediaries are also an important factor influencing the interpretation of study results. They are often trusted and their assessment is disseminated as being similar to one's own attitude. They therefore represent great potential for future science communication. If they are not identified and involved at an early stage, trust-building communicators will be lost. In the context of the Elbe estuary, a long history of mistrust could thus grow.

Research methods

A qualitative approach was chosen to trace complex processes, patterns of interpretation, attitudes, and behaviors in the specific topic of estuary management. The following steps were followed for the study:

(1) **Selective and systematic selection of four case studies in two different estuaries** - A wide range of different use cases and studies were considered. The comparative consideration of the Elbe and the Humber estuary promises valuable insights, especially for the subsequent identification and elaboration of best practices. The case studies within the context of the Elbe estuary have different time horizons (in response to acute impacts vs. long-term planning) and spatial focus or degree of scaling of the object of study (subject: very limited to fish kills or specifically around a technical measure).

(2) **Environment and document analysis of media press coverage and the consultation process on the Humber River Basin Management Plan** - The object of the environment and document analysis on the Elbe estuary are the media monitoring reports of the Hamburg Port Authority. A total of 74 monitoring reports from November 2014 to December 2020 were examined. For the Humber estuary, submissions from stakeholders, interested and affected parties on the Humber Basin River Management Plan and the corresponding "responses" or "consultation response documents" were considered. These were supplemented by evaluations of the Environment Agency and additional publications and papers.

(3) **Guided and expert interviews** - In the period from November 2020 to January 2021, 18 interviews (approx. 60-90 minute video or telephone conferences) were conducted on the Elbe estuary with representatives of the official and ministerial administration, research and relevant public and economic stakeholders. On the Humber estuary, a total of five interviews was conducted with representatives from all stakeholder groups, as well as two supplementary preparatory discussions.

(4) **Qualitative content analysis and evaluation of recommendations** - The findings obtained through the document and media analysis, as well as the results of the guided interviews, were subjected to a qualitative content analysis in the next step. The aim of the analysis was to structure all the findings obtained along possible influencing factors and to derive recommendations from them.

Findings - The interpretation of the study results is biased by a long history of conflict at the Elbe estuary

The analysis of media coverage and interviews shows that the discrepancy between the objective study results and an interest-driven interpretation of the effects of fairway adjustments at the Elbe estuary is difficult to resolve (Interview 6, Elbe). Consequently, a history of mistrust has built up, which originated in great parts with the filling in of the Mühlenberger Loch and the fairway adjustment since 2003. Reinforced over a long period of time, this past has shaped the distrust in the acting authorities and scientific institutes. Along with this, world views, explanatory patterns and group identities have also solidified along this conflict. These have a lasting effect on the discourse at the Elbe estuary - and thus also the discussions about sediment management and water ecology (Interview 9; 14; 18, Elbe). New topics related to the Elbe estuary are seen through a critical eye and causally linked to fairway ajustments. This concerns the forecasts for the port development plan as well as the subsidence of the dike crest after the last deepening of the Elbe estuary (Interview 9, Elbe).

Mostly studies related to measures are perceived as politically motivated

The distrust of the critics is mostly connected with actual measures. Especially when studies, like the modelling of the BAW, aim to make a project feasible - which means it is not the question “whether” a measure is to be implemented but “how” to make it technically and legally safe -, scientific findings of advocates and critics of the measure are brought against each other. In such a framework the question of interpretational sovereignty becomes the main issue. Other studies, such as the so-called “System Study II”, were hence often marked as a biased facilitation for the project. It is therefore not surprising that critics see each new study as an attempt by the authorities to justify ongoing or further measures in the context of fairway adjustment, which must be generally refuted (Interviews 2; 6; 12, Elbe).

Only little response from authorities and scientific institutions

Thus, every new study on the Elbe estuary and every observable phenomenon is linked to the disputed fairway adjustment and hyped up in the media discourse. Media and environmental groups offer alternative explanations for everyday observations that seem to contradict the study results (Interviews 1; 7; 12; 16, Elbe). Distrust of scientific explanations arises partly because the studies are not publicly accessible, and partly because authorities and scientific institutes leave the visible interpretational sovereignty to the critics. These everyday experiences are seen as an important corrective for the critics - more important than scientific results (Interviews 7; 8; 10; 11, Elbe), even despite also the critics see that there are different reasons for the decline of the fish population or the increasing sedimentation (Interview 11, Elbe), reasons which are not taken up by the media though.

At least the "Forum Tideelbe" stated in its final report that all participants agree that both anthropogenic measures (dikes, channel adjustments) and natural effects, e.g. of climate change (more dry periods in the Elbe catchment area) led to the changes in the tidal dynamics - a first step out of the history of mistrust.

Recommendation 1 - Build common understanding of science in the long term

Estuarine research is similarly complex as climate research. It is difficult to communicate facts of this magnitude in a simple way. There is still a lack of understanding of estuarine systems and basic understanding of scientific working methods and knowledge discovery, the so-called "science literacy". At the same time, the authorities and scientific institutes at the Elbe and Humber estuaries cannot not communicate. In the end, the processes of change become inevitably noticeable and can no longer be "interpreted away". The goal should be to build up a basis of knowledge and convictions shared among the stakeholders and the authorities on the systems of the Elbe and Humber estuary before actual measures are discussed.

Make study results publicly accessible and readable

Study results must be publicly available - this is demanded by stakeholders of the Elbe and Humber estuary (interviews 8; 9; 15, Elbe; doc. 4; 14; 76, Elbe). Results (including non-results) and the methodological procedure should be presented in clear, everyday language, with recommendations for action, appropriate to the target group (Interview 11, Elbe; 22, Humber). This also includes information on which interpretations of the results are legitimate and which, on the other hand, are not permissible from the research findings (interviews 4, Elbe; 22, Humber).

Designing public relations proactively

The study shows that scientific reports are usually communicated via media reports and are rarely read in their entirety. Therefore, professional public relations should be proactive and address open questions at an early stage. In addition to a trusting exchange with the stakeholders, this can also support the classification and interpretation of the results.

Making the experts visible as people who do research

According to the results of the interviews, the scientists are just as interested in a good future for the estuaries as the people living directly at the river. This motivation should be communicated at an early stage to counteract mistrust and skepticism towards scientists. This applies to the entire research process, from the awarding of the contract to the formulation of investigation goals and the presentation of results. Furthermore, scientists strengthen their perceived integrity and benevolence by consciously breaking with the cliché of the "ivory tower theorist" and seriously dealing with contradictory everyday observations of the actors on the ground.

Winning local “care-taker” and intermediaries

It is essential to talk on an equal footing to all stakeholders and those affected - this can be done at public information events or by local trusted persons such as intermediaries, “care-taker” and intermediators. In this context, it is important to actively involve rural areas and formally less educated groups in particular.

Recommendation 2 - A research agenda for a common base of values

Trust grows through a long process of mutual social interactions and positive experiences. Scientific investigations on the Elbe estuary should more strongly anticipate and take into account different views, issues and possible reactions at the level of common interests and values.

Break with the project logic and set goals together

In the end, the courts decided on the fairway adjustment, not least on the basis of the studies submitted. Fundamental to this legal dispute, however, are different views on the priorities for the estuary and, ultimately, the significance the Port of Hamburg for the metropolitan region in the future. To resolve this conflict of values, the region must move out of the *knowledge-for-project planning logic*. It is recommended to define development goals for the estuary within the framework of a joint research agenda, to commission expert opinions together with the affected parties and to counteract the escalation in court.

Clear political mandate and powers for administration

To ensure that initial positive experiences with the Elbe estuary Forum are not disappointed again, political support is needed. One clear politically and financially sound mandate to develop the Elbe estuary on the basis of scientific findings is key to a trust-enhancing cooperation on all levels. In addition, public authorities must take a more active role in steering the process and bringing together and implementing the results.

Involve stakeholders throughout the process

A joint research agenda for the Elbe estuary means that authorities, industry and environmental associations jointly work out which questions are to be considered and answered in the investigations (Interview 7, Elbe). A consensus regarding the object of investigation, service components, research objectives and questions, and the research method can be recorded in jointly formulated tender documents (Interview 9, 10, 12, 16, Elbe).

Channel conflicts and expand consultation beyond the inner circle

Despite comprehensive communication and clarity about partial aspects of planning, every decision to take action ultimately has locally tangible consequences. A joint research agenda can create the framework for openly weighing up decisions and their effects. It is important to take potential concerns seriously and to channel conflicts at an early stage. In addition to a clear agenda, it is therefore advisable to use systematic consultations to ensure feedback from those affected and, at the same time, to formalize a place for the exchange of opinions.