

Stakeholder perceptions of spatially differentiated regulation to manage nutrient loads in the Baltic Sea

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Abstract

The natural removal of nitrate in groundwater and surface water shows large spatial variations within and across catchments discharging to the Baltic Sea. This natural variation can be exploited through spatial targeting of measures in order to reduce nutrient loads (N and P) to the Baltic Sea. This paper discusses the perception of stakeholders in Denmark, Sweden, and Poland towards implementing a spatially differentiated regulation. An ethnographic study and nine workshops were used to assess which governance approaches would be most suited to implementing spatially differentiated regulation. Co-governance, meaning a transition from hierarchical governance to more dispersed and relational power, presented itself as the most promising approach. However, it must acknowledge different cultural groups within Europe and it requires a certain degree of flexibility from all involved participants.

Key words: Baltic Sea; co-governance, governance, spatially differentiated regulation, stakeholder perceptions

1. Introduction

Nitrogen (N), and phosphorus (P) loads from land and atmosphere to the Baltic Sea peaked in the 1980s and since then have been decreasing, mainly due to a significant reduction in point sources in coastal areas (for example by improving sewage treatment) (Gustafsson et al. 2012; Elmgren et al., 2015). The Baltic Sea Action Plan (HELCOM, 2007) however requires substantial further reductions of N and P loads. Achieving additional reductions is not an easy task. In many cases, the ‘low hanging fruits’ (i.e. the most straightforward measures) have already been implemented (see Dalgaard et al., 2014). Existing action plans usually apply measures uniformly across administrative boundaries. However, this uniform approach does not account for the significant spatial variation in the retention (removal by biogeochemical processes or sedimentation) of nutrients in groundwater and surface water systems.

By using local data on nutrient transport and retention, measures can be spatially differentiated to target ‘hotspot’ areas where the natural retention is low (Refsgaard et al. 2019), the BONUS SOILS2SEA project considered the potential of spatially differentiated approaches for achieving further reductions in nutrient loads to the Baltic in different case study areas. This can involve, for example, mitigation measures being placed in areas with low natural N-reduction or crops and cropping systems with larger nitrogen leaching losses being relocated to fields with higher retention. To exploit the full potential of this approach, there is a need to predict where in a catchment N is reduced along the flow path. This can be done with the use of so-called N-retention maps. Best results will be reached by using N-reduction maps at finest possible scale (100/200 m grids). However, fine N-reduction maps are currently uncertain (Hansen et al., 2014). To provide a counterbalance to such uncertainty, local knowledge and observational data from farmers and land owners can be used to support.

Using differences in natural retention to inform management and policy poses a challenge. The fact that farmers and land owners will be affected in different, and potentially unequal ways, calls for new governance and monitoring regimes. In this paper, we explore the views of stakeholders from three case study areas in Denmark, Sweden and Poland who participated in various forms in the BONUS SOILS2SEA project. We assess the concept of spatially differentiated regulation and three different ways, in which such a regulation could be implemented. One of these approaches is a ‘co-governance’ regime, in which “societal parties join hands with a common purpose in mind, and stake their identities and autonomy to this process” (Kooiman 2008). It refers to the transition from hierarchical governance to more dispersed and relational power (Graversgaard et al. 2018) leading to direct societal involvement in the core functions of government (Ackerman 2003) and shifting the role of government into a process facilitator.

2. Methodology

The results of this paper stem from research activities undertaken in the BONUS SOILS2SEA project with focus on three case study areas: Norsminde Fjord catchment (Denmark); Tullstorp Brook (Sweden) and the Kocinka catchment (Poland). To evaluate stakeholder perceptions towards spatially differentiated regulation in these areas, two main methods were implemented. An ethnographic study was conducted to consider socio-cultural perspectives and how these could be integrated into the formulation of policy options (see chapter 2.1). Building on the ethnographic study, different sets of workshops were carried out

to more closely assess the attitudes of different stakeholders towards the implementation and limitations of spatially differentiated regulation (see chapter 2.2)

2.1 Ethnographic Study

The ethnographic study in the BONUS SOILS2SEA provides an in-depth, case based background to the case studies. It was carried out before and in parallel to the workshops to support the formulation of policy options and instruments by explaining rationales of motivations and convictions of stakeholders. The awareness of cultural aspects and its importance for policy planning and implementation has been reflected in global governance processes e.g. through the UN Universal Declaration on Cultural Diversity (UNESCO 2002). In the study, culture was applied as an ideational system where culture comprises beliefs and values and is non-material and non-social (Geertz, 1973; Ross, 2004). The methodology provided place based backgrounds for the three case study sites. Information was mainly collected through desk-research involving materials available through archives, libraries, galleries as well as narrative qualitative interviews. This information was used to assist the co-development of measures and provided reality checks regarding acceptability and socio-cultural fit for the choice of policy options. For the three case studies, 40 interviews with local stakeholders were supplemented by numerous informal conversations and observations of daily practices and routines.

2.2 Workshops

The aim of the workshops was to produce reliable and valid data about the domain in question and the findings feed back into the research process (Ørngreen and Levinsen, 2017). In this case, a participatory multi-stakeholder workshop approach was used to assess participants' attitudes towards spatially differentiated regulation.

The first set of workshops, one at each case study site, took place in late 2014 with the aim of introducing the general idea of the project, identifying problems, actors, and some initial ideas for possible solutions. In total 47 participants joined the three workshops. Stakeholders invited to the workshops included local farmers, land owners, land managers and their organisations, NGOs, community members and (local) political decision-makers.

The second set of workshops took place in late 2016 with a narrower focus on discussing three management scenarios. These approaches included a more top-down or centralized approach, a market based approach, and a co-governance approach. The features of these approaches are summarized in Table 1 and were adjusted to the local context for each of the three case studies. 80 participants joined these workshops, representing the same of group of stakeholders as in the first set of workshops (with numerous stakeholders joining for the second time).

Table 1 Features of the three scenarios discussed at the workshops

Management Scenario	Centralised/ top-down	Market based/ flexible management'	Co-governance

Approach	Clear N-reduction targets uniformly for the whole catchment at farm or field level.	Cap-and-trade system to reach state set nutrient load target.	Co-organisation of farmers to reach state set nutrient load target.
Monitoring	Authorities are responsible for detailed monitoring and requests management plan from farmers.	Authorities only monitor the N load at catchment level and requests management plan from farmers. More detailed monitoring could be arranged by farmers.	Authorities monitor the N load at catchment level. More detailed monitoring could be arranged by farmers.
Retention maps	Only low resolution maps at around 15 km ² are used by government to structure the land use (e.g. catch crops, constructed wetlands).	High resolution maps at 25ha are used by authorities to calculate the exact amount of allowances and their distribution among the catchment.	Could be one tool used by farmers to optimize their fertilizer usage and cropping patterns.
Subsidies	Connected with the requirements set by the authorities.	Connected with the precise usage of allowances.	Only given if the reduction target for the whole catchment is reached.

Thirdly, three up-scaling workshops with 41 regional stakeholders in Germany, Sweden and a transboundary workshop in Poland/Russia were held in 2017 based on the findings of the previous sets of workshops. At the workshop in Germany (Berlin), different variables of co-governance were discussed with stakeholders from riparian Baltic Sea countries. At the Swedish (Gothenburg) workshop, participants discussed if co-governance could be transferred in practice to different areas and up-scaled to the national level. In a third workshop in Poland (Olstyn), Russian and Polish stakeholders were invited to discuss issues of transboundary water management.

All nine workshops had similar structures. They comprised of informative presentations of the project and preliminary project results regarding knowledge of loads of N and P, retention levels, or methods for remediation measures. An interactive session, mostly in form of a world-café was used to discuss the relevant questions of the workshop. All workshops had a networking and social component to provide opportunities for more informal discussions of the topic and exchange on practical challenges for implementation. The case study workshops were held in the local language, while the up-scaling workshops in Berlin and Gothenburg were held in English.

3. Results

3.1 Results from ethnographic studies

In the same way as the geo-morphological soil conditions differ across the case study areas - the socio-cultural- economic characteristics of the people living and working on the different soils are very different. This in turn leads to diverse decisions with respect to farming practices, nutrient inputs and outputs, collaboration amongst farmers, monitoring, and reactions towards measures and regulations.

Commonly, European cultures are attributed to geographical regions such as Northern/ Northwestern Europe, Eastern and Southern Europe. For instance, cultures and practices in Northern/ Northwestern Europe are often associated with an issue- and result-oriented culture of decision making (Fischer 2009).

Cultures in Eastern Europe need to be understood in the context of post-socialist transitions and interrelations between ideologies and practices, issues of trust amongst different stakeholder groups, and coupled with shortage of environmental information and access to information in general (Stataniunas 2009), while cultures in Southern Europe tend to be oriented alongside the traditions and principles of 'patronage' and 'familism' (Vettoretto 2009).

Researchers, for example Friedmann (2005), argue that despite the unifying power of European policies, differing cultural settings affect reactions to European challenges such as the implementation of the European Nitrate Directive or the Water Framework Directive. In the BONUS SOILS2SEA case study areas in Denmark, Sweden and Poland it was found that the perceptions, values, beliefs, and thoughts about nature and the environment differ considerably. In this way, there are important variations in the needs, acceptance and uptake of measures and regulations. As a consequence, this cultural diversity leads to solutions suitable in one location being unsuitable in others.

In **Denmark**, agriculture has been the dominant sector and the export of agricultural products the backbone of its economy until the 1960's. Denmark developed into a country of high intensity farming where the regulation of agricultural production is based on elaborated system of monitoring and controlling of inputs such as amounts of fertilizers and crop types. Projects results showed, that environmental knowledge of farmers in general and the knowledge and routines of controlling inputs as well as monitoring of outputs in particular are high and farmers appear very informed. However the level of frustration about approaches which were perceived as an 'autocratic system of regulations' was noticeable throughout many conversations. The system of monitoring and controlling inputs was understood as a heavy administrative burden without any flexibility towards allowing the farmers to find local solutions based on local spatial conditions. Hence, proposals calling for more flexibility, like a spatially differentiated approach in co-governance system were seen rather positively.

In **Sweden**, cooperative farming - in the sense of sharing information, equipment, storage - has a long tradition and especially in the county of Skåne where the case study of BONUS SOILS2SEA is located. Transitions in the farming practise led to environmental problems in the case study region. The Tullstorp Stream Economic Association (TSEA) was founded to restore the water course in the catchment. It is an example of a group built up through self-initiated local processes. This history of cooperation, with the TSEA as one recent example, is why top-down approaches were not seen as appropriate by stakeholders. They rather stated that governance concepts should be rooted in bottom-up processes and local context.

With its turbulent history, the transformation of the 1989 period and the accession to the European Union, Polish farmers had to cope with manifold social and economic changes which have led to particular needs and aspirations among Polish farmers. For example, Polish stakeholders were rather critical of the co-governance approach based on previous failed experiences with cooperatives and group decision-making, they feared of losing the power to make their own decisions. On the other hand, an experienced catchment officer that would help with administrative burden, as they seen from a Swedish example, the co-governance approach, was seen as very positive. Results from the Polish part of the study led to a documentary film (see Martinez & Berrini 2016).

The examples from the different case studies demonstrate that a co-governance approach cannot be applied uniformly across different EU countries, but has to acknowledge differences in socio-cultural context.

3.2 Results from the workshops

Altogether nine stakeholder workshops were carried out in three phases between 2014 and 2017 with more than 160 participants joining. At the first set of workshops, different policy instruments and options were proposed and discussed, including ones that empower local stakeholders collectively to commit to targets and decide on technical measures for implementation. These workshops provided a first point of exchange between the BONUS SOILS2SEA project and local stakeholders. Measures for improved water quality were discussed differently in each case study region depending on local needs and previous work. In Poland discussions were on a more general level around water quality regulation, Sweden developed water improvement measures in the workshop, while Denmark discussed specific spatially differentiated regulation options. All workshops focused mostly on practical measures (rather than policy instruments which are used for analytical orientation).

At the second set of workshops, focus was on the aspect of spatially differentiated regulation and three different management scenarios for implementing spatially differentiated regulation (see Table 1) were discussed. At the workshop in **Sweden**, technical, environmental and agricultural measures (e.g. catch crops, wetlands) with which stakeholders had experience were considered more feasible than complex measures around co-governance regulations, on which there was a lack of experiences and knowledge. This inexperience created space for fear around the potential for devaluation of land and injustice. In **Denmark** stakeholders found catchment level regulations helpful to achieve larger scale projects with higher impact and that the co-governance approach was the most promising way to implement the regulations. However, an additional, independent institution would need to ensure trust and compliance for such co-governance concepts as farmers were not seen to be able to regulate each other. In **Poland**, a major concern was other sources of water pollution besides agriculture and a lack of support for farmers. In all workshops, a general need for simplicity before bureaucratic complexity (and economic burdens) was expressed. Stakeholders, especially in Poland, feel already too much of a bureaucratic burden. Hence, concepts should be easy to understand or old concepts should be improved. Financial compensation and education were seen as useful tools to help acceptance and implementation. This need for simplicity was also experienced implicitly in the discussions in Denmark around (the complex topic of) emission based trading. Also, Swedish stakeholders expressed concerns of too rigid bureaucratic regulations. Furthermore, stakeholders at the workshops tended to visualise eutrophication at a higher level, and shift the burden away from an individual scale. Although research, especially in Poland, needs to be conducted to show evidence of the main sources of eutrophication. Exchange on good practices, also outside the farming sector, could be beneficial to show that other sectors are also active and inspire farmers and land-owners with possibilities. Generally, solution-oriented instead of problem-oriented concepts were seen to benefit constructive communication processes.

During the second set of workshops, the co-governance approach was seen as a promising way to implement spatially differentiated regulation. Therefore, the third set of workshops focused especially on the co-governance approach and how this could be of help in implementing spatially differentiated regulation. Stakeholders in the Swedish workshop saw important potential in a co-governance approach, as

did certain participants at the European workshop. However, when talking among representatives from different riparian Baltic Sea countries it became clear that existing governance arrangements have a strong influence on what is politically possible. In Sweden, there are challenges for a roll-out of a co-governance approach, but these seem surmountable. In relation to the design of co-governance approaches, aspects like trust, communication, clear goal-setting, and transparency were seen as key determining factors of success. With regards to the monitoring process, there appears to be some differences in terms of what is needed for the co-governance process to work effectively, and what is scientifically possible. The role of institutions and stakeholders is something that varies from country to country and needs to be adapted to each individual case. The transboundary workshop in Olstyn did not address the co-governance issue directly. Simply having the possibility of exchange was considered the most important goal between Russian and Polish stakeholders in this transboundary catchment. More formal cooperation, like a joint monitoring program between the regional and local authorities would be a first step to reduce environmental problems in the catchment.

4. Discussion

The discussion is based on results from a total of nine governance workshops, desktop research, and an ethnographic study, which included several interviews, observations, and case study visits in Poland, Sweden and Denmark. It covers three main aspects: the potential of a co-governance approach, how it can be linked to spatially differentiated measures and how such an approach can be monitored.

4.1 Co-governance as a promising style of governance

The recognition that a co-governance approach could be a promising way to reach reduction targets crystallised in the second round of the local case study workshops. Co-governance aspect has emerged as something of a novel approach in the context of managing nutrient loads in agriculture. Research in other European countries shows that there is rather limited experience in cooperation on environmental issues in agriculture. Smith et al. (2017), reporting on the UK, found that farmers generally do not have experience collaborating with one another. This might also be true for other European countries, and can potentially be explained by the Common Agricultural Policy (CAP) and agri-environmental schemes (AES), which have traditionally been delivered at the scale of the individual farmer (Prager 2014). However, Prager (ibid.: 62) also highlights the positive aspects of collaborative efforts: “Collaborative management can be more cost-effective because costs are shared and minimised, (...) aid the harmonisation of multiple objectives, and facilitate the sharing and mobilising of resources.” These positive effects were also mentioned in the project workshops, where it was highlighted that collaboration efforts can enhance trust among the participants, a key factor for the effective management of common pool resources (see Ostrom 2010).

The co-governance approach is characterised by “inviting social actors to participate in the core activities of the state” (Ackerman 2003). This process was discussed intensively at the workshop at Gothenburg, where it was stated that a co-governance approach would shift roles and responsibilities, which would require adaptive authorities. This would mean a change to a more traditional and hierarchical governance approach – this shift was seen as one of the major barriers for the implementation of co-governance. Graversgaard et al. (2017: 19), however, emphasise that a mix of “fixed institutional framework around public participation” can lead to cost-effective governance results. With the respect of barriers to

implement mitigation measures, Lesch and Wachenheim (2014: 20) focused on buffer strips and identified barriers, such as “lack of information about site specific costs and benefits and about conservation alternatives, and that the information that is presented is often too technical”. With a co-governance approach, some of these barriers can be overcome through participation and discussion. As a review of other case studies (Newig and Fritsch, 2009; Reed 2008) demonstrates, participation might not always be successful at reaching environmental goals, but it seems that in general participatory approaches lead to collective learning which can lead to new and creative solutions.

Results from the workshops support the findings from the literature that co-governance is a promising approach, but that there are also obstacles that have to be solved before implementing such a system. Especially at the up-scaling workshop in Berlin, variables for successful implementation of co-governance were discussed (see Stelljes et al. 2017). Aspects like trust among the group-members, transparent communication channels and conflict resolution mechanisms, or a long enough time horizon (and as identified in the literature on common pool resources, see Ostrom 2010 or Stelljes et al. 2017 for an overview) were considered to be essential variables.

4.2 Spatially differentiated measures in the context of co-governance

Reduction of nitrates in groundwater and surface water systems shows large local spatial variation due to geological heterogeneities. This heterogeneity could be positively operationalised for overall reductions in nutrient loads if, for example, mitigation measures were placed on fields with lower N-reductions. However, with traditional uniform regulation these heterogeneities in the natural environment cannot be fully exploited. Results from the project show that significant gains can be obtained by relocating existing agricultural practices without decreasing fertilisation inputs (see Hansen et al., 2017). A key tool in this approach is the production and usage of N-reduction maps showing how much N is removed by natural reduction processes, i.e. the ratio between the N-load out of the catchment and the N-leaching from the root zone for each spatial unit within the catchment (Refsgaard et al., 2019). The finer the resolution of the maps (e.g. 1ha or below), the more accurately mitigation measures can be placed. Maps with coarse resolution (e.g. 15 km²) cancel out potential gains of the differentiated approach. Fine resolution N-reduction maps are, however, associated with considerable uncertainty (Hansen et al., 2014).

At the second set of workshops and the up-scaling workshops in Gothenburg and Berlin, the differentiated approach was discussed in more detail. Results showed that the level of uncertainty that is connected with the fine resolution maps seems to be one of the biggest challenges for the implementation of the differentiated approach. Firstly, more scientific evidence is needed in order to reduce the uncertainty and also to gain the trust of local stakeholders. It became clear that, without trust in these maps, a spatially differentiated approach cannot be carried out.¹ Another critical aspect that was discussed at the Gothenburg workshop was the question of who bears the risk if these retention maps lead to undesired outcomes. In particular, it was mentioned that there might be a risk, that certain mitigation measures, for example constructed wetlands, are not as efficient as expected. This becomes a problem if mitigation measures are undertaken but reduction targets are not reached.

¹ This was especially apparent in interviews conducted with farmers in the Danish case study area, who showed distrust in the use of retention maps by the Danish government (see Stelljes et al., 2017).

Thorsøe et al. (2017: 209) delved in the idea of implementing a spatially differentiated approach and “explored how the legitimacy of regulation is challenged when the regulatory regime changed from general to differentiated regulation.” This aspect was especially discussed at the up-scaling workshop in Gothenburg and the term ‘adaptive governance’ was used to describe the role of the administrative level. For authorities to be adaptive in order to implement a co-governance approach was seen as one of the difficult parts at this workshop.

A co-governance approach can be a supporting element for the implementation of spatially differentiated measures. In a co-governance setting, the local stakeholders have a certain freedom of action, in which they self-determine the implementation reduction targets. The workshops and interviews indicated that the differentiated approach, if used on a voluntary basis and not enforced in top-down way, would be much more widely accepted. In this case, the uncertainty related to the retention maps is not of such importance, because these maps would only act as a supporting element and not as a regulatory element. However, this voluntary approach would also mean that there is no guarantee that the full potential of the differentiated approaches would be exploited. Having said this, applying the differentiated approach in a co-governance approach seems promising, at least from the point of view of local stakeholders.

4.3 Monitoring in a co-governance approach

The discussions from the workshops showed that monitoring is a very important element in a co-governance approach. How the monitoring is carried out has to be clearly defined from the very beginning. For the discussions at the second set of workshops, three scenarios of governance were developed with also accounting for different monitoring schemes (see table 1). For the co-governance regime, a scheme with a central monitoring approach and a more detailed monitoring approach was developed. While the central monitoring is undertaken by authorities to monitor the loads at catchment level, the more detailed approach can be arranged by the farmers.

Discussions at the local and the up-scaling workshops led to similar results. The central monitoring option, which is the basis for evaluating success is therefore the basis for sanctions and subsidies mechanisms, must be clearly defined before the governance approach is implemented and should be conducted by third-parties or authorities. One of the main reasons is credibility and trust in the results of the monitoring.

A more detailed monitoring from sub-catchment level up to farm level is necessary to monitor the success of single mitigation measures, like created wetlands, buffer strips, or other measures. Especially when applying differentiated measures, monitoring is crucial to document the efficiency of the approach. In the co-governance approach it was suggested that these kinds of monitoring could be organised by the farmers themselves and not by the authorities. Some participants of the local workshops, particularly in Sweden and Poland, suggested that the detailed monitoring at farm level should also be carried out by authorities and were reluctant to undertake the monitoring themselves. One reason was that they feared that this would increase their workload without remuneration. However, this would be a very expensive solution and participants at the up-scaling workshops stated that this would hardly be covered by the budget of the authorities.

A solution to this problem was suggested in the workshops in Denmark and Germany. Here, participants discussed the possibilities of citizen science to support the monitoring process. Citizen science can be

understood as “the engagement of non-professionals in scientific investigations – asking questions, collecting data, or interpreting results” (Miller-Rushing, 2012). In this case, it would be farmers who would be involved in the monitoring activities, not only for scientific investigations, but foremost for the evaluation of certain mitigation measures. At the second workshop in Denmark, a new technology for water sampling was presented to the farmers by the Danish Knowledge Centre for Agriculture (SEGES), which was received with great interest. This interest, together with emerging and easier to use technologies (for example apps or other programs on smart phones), demonstrate that citizen science can be a useful monitoring strategy. One question that was asked at one workshop was whether citizen science monitoring results are reliable. Steinke et al (2017: 9) show in their study, that “relatively low reliability of individual results does not undermine the accuracy of the findings when a sufficiently large group of farmers participates.” Additional positive aspects of participatory monitoring schemes are mentioned in studies by Mills et al. (2012) and Schmeller et al. (2009). These studies show that the monitoring schemes can be made more cost-effective if undertaken in a participatory way and that this can also lead to social learning activities by the different farmers.

5. Conclusions

The workshops at local level with farmers and local stakeholders showed that the co-governance approach holds much promise, at least in the case of Denmark and Sweden. The up-scaling workshops in Berlin and Gothenburg on the other hand highlighted some key implementation challenges perceived by national authorities. The co-governance approach was generally regarded as an inspiring concept, but the feasibility for larger regions or even nations was still subject to discussion. When examining the design principles and variables of co-governance (e.g. trust, monitoring mechanisms, time, or clear sanction mechanisms) it became obvious that certain variables and principles may work well at larger levels, while others may be difficult to implement.

Co-governance was positively acknowledged as an approach that empowers local stakeholders and enables local knowledge to be used. Examples presented at the workshops showed that local actions can bring positive results and reductions in nutrient inputs can be achieved. It was also seen as positive that with the help of external funding a project manager could be hired. However, this positive example was driven by very specific personalities and therefore the example is very context specific. At the workshops it was discussed how this key success factor can be institutionalised. So-called catchment officers, being responsible for the administrative burden of the co-governance approach, were considered as one way to institutionalise the process. But to be effective, these catchment officers need a wide variety of competencies, to be equipped with certain decision-making power, and have some budget available.

Aspects of time were discussed at different levels. It needs to be recognised that some remediation actions take time to be effective. These time-lags can be up to several years and even decades, depending on the natural condition of the area. Apart from considering the natural conditions, establishing a co-governance system needs a certain amount of time. Building up trust, sharing information and knowledge, and having open discussions with stakeholders are time consuming for the involved parties. This can be especially problematic for authorities if several co-governance approaches in different regions have to be supported.

Co-governance requires a certain degree of flexibility from all involved parties. An up-scaling of the co-governance approach will only be successful if it also succeeds in creating a degree of flexibility in dealing with the approach at the administrative level. To allow adaptive governance that acknowledges regional differences seems to be a major obstacle that has to be overcome before a co-governance approach can be successfully implemented.

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