"Everyone Has a Truth": Forms of Ecological Embeddedness in an Interorganizational Context

Abstract

Environmental issues involve a wide range of actors often brought together in processes of collaborative environmental governance. Nonetheless, such actors frequently disagree on the definition of these issues. Even sharing an environmental concern does not preclude disagreements. This paper takes the concept of ecological embeddedness—so far analyzed in a single community—to explore differences of views among actors involved in collaborative environmental governance. It does so by pursuing a qualitative study of French River Basin Committees. Our findings show that Basin Committee members take radically different approaches to ecological matters and therefore put forward opposing diagnoses and prognoses of their shared ecological context. We identify three dimensions of ecological embeddedness that are critical for collaborative governance, namely: ecological engagement; ecological ontology; and ecological knowledge. Our results indicate that different forms of ecological embeddedness can fuel long-lasting disagreements despite members' shared appreciation of collaboration. This is especially so if the deliberations focus on 'facts' – with actors pitting their ecological knowledge against one another – without facilitating discussions on ecological engagement and ontology.

Keywords: ecological embeddedness, collaborative governance, environmental disputes, scientific knowledge, deliberation

Introduction

In 2021, the debate on France's Climate Act stirred up an old environmental dispute concerning the demolition of watermills. An amendment sought to forbid funding for their destruction (Laperche, 2021). For years, Environmental NGOs (ENGOs) had been pushing hard to lessen the number of physical obstacles on rivers, which impact biodiversity and river flow. These ENGOs sometimes demanded the destruction of watermills in the name of river ecosystem restoration. They were faced with actors who wanted to keep these watermills, especially for their hydropower potential in the face of looming climate change. Both camps defended their arguments with a concern for environmental issues and claimed that their case was backed by scientific evidence. This incident shows how sharing an environmental frame is not enough to overcome disagreements (Zimmermann et al., 2021), just as scientific knowledge cannot single-handedly settle environmental disputes (Sarewitz, 2004). Accordingly, this paper seeks to understand some of the unexplored sources of disagreements in environmental disputes.

Addressing environmental disputes requires the involvement of a broad range of actors (public or private) in "collaborative approaches to environmental management" – globally referred to here as collaborative environmental governance (Bodin, 2017, p.357). Collaboration is supposed to help actors find some common ground but it takes a lot of time, and cognitive and emotional work (Ansari et al., 2013; Fan & Zietsma, 2017). Actors in environmental disputes tend to have highly diverse and conflicting views on the problems at hand (e.g. Hoffman, 1999; Lewicki et al., 2003; Harley et al., 2014; Montgomery & Dacin, 2020; Zimmermann et al., 2021). Environmental disputes often crop up around 'wicked' problems—that is to say ones marked by knowledge uncertainty, value conflict and dynamic complexity (Dentoni et al., 2018). In such disputes, differences of views may even cut across stakeholder groups (Brummans et al., 2008).

Environmental disputes can drag on despite consultation and mediation efforts (Lewicki et al., 2003), stemming from different mental frames (Gray, 2004; Dewulf et al., 2009; Hassenforder et al., 2016). But recent research reveals that diverging views can arise even within a shared environmental frame (Zimmermann et al., 2021), pointing to unexplained complexity in environmental disputes. This paper takes a complementary approach to grasp differences in individuals' views on environmental issues, looking at the role played by the actors' ecological embeddedness. In their seminal paper, Whiteman and Cooper conceptualized ecological embeddedness as "the degree to which a manager is rooted in the land—that is, the extent to which the manager is on the land and learns from the land in an experiential way" (2000, p. 1267). This concept is key to understanding how actors relate to their ecological context and make sense of it (Whiteman & Cooper, 2000, 2011). It also has the potential to contribute to the study of environmental disputes but has not yet been explored in an interorganizational context. We take an exploratory qualitative approach and ask the following research questions: How are actors of collaborative environmental processes embedded in their ecological context? How does this ecological embeddedness condition their views on environmental issues? What role does it play in environmental disputes? To tackle these questions, we engaged in a qualitative study of two French River Basin Committees.

Our findings show that Basin Committee members, even when involved in the same collaborative governance body for many years, take radically different approaches to environmental issues, to the extent that they hold different "truths". Behind disputes stand different forms of ecological embeddedness, rooted in three key dimensions of ecological embeddedness: ecological engagement, ecological ontology, and ecological knowledge. Hence, disputes go beyond power imbalances or conflicts of interest. In Basin Committees, a prevailing discourse focusing on 'fact-based' decisions hinders members from grasping their opponents' standpoints. Indeed, they only get to talk about their respective ecological knowledge but not

about their ecological engagement or ontology. Actors can all too easily see the knowledge of others as mere 'belief' if they fail to grasp the physical and emotional experience, and the meaning system underpinning it.

Literature Overview

Differences of Views in Collaborative Environmental Governance

The participation of local actors in the governance of social-ecological systems can help mitigate conflicts, gather valuable information on a territory, improve the quality, legitimacy and implementability of decisions, and increase reactivity to emerging issues (Wondolleck & Yaffee, 2000; Newig, 2007; Jager et al., 2020). Beyond simple regulatory outputs, collaboration can foster trust (Leach & Sabatier, 2005), empowerment (Fraser et al., 2006) and social learning (Pahl-Wostl et al., 2007) among local actors. Yet, collaboration does not rule out conflicts or poor ecological outcomes (Lewicki et al., 2003; Zuzul, 2019). Collaborative environmental governance is necessary yet not sufficient to ensure the sustainable management of ecosystems (Bodin, 2017). Aside from outright failures, collaboration processes and outcomes are uncertain as they are time and resource-intensive, require effective mediation, and depend on the broader context such as power imbalances (Ansell & Gash, 2008; Leach, 2006; Reed, 2008). Properly drawing on different kinds of knowledge (experiential; local; scientific) also poses a key challenge (Raymond et al., 2010).

Furthermore, actors discussing collaborative governance initiatives seldom share either the same view or knowledge of the problem at hand (Heikkila, 2017; Weber, 2009). Disagreements are often linked to 'wicked problems' (Harley et al., 2014; Innes & Booher, 2016; Dentoni et al., 2018). Diversity of opinions is not questionable in itself, since it is constitutive of any deliberative process. It can include "epistemic contestation" – meaning, lack of a shared understanding of the situation itself (Arenas et al., 2020). But lasting disagreements on problem

definition and cognitive representations can hamper deliberations and decision-making, turning environmental disputes into collaboration failure (Gray, 2004; Hassenforder et al., 2016; Zuzul, 2019). Even when things do not reach this pass, lasting disagreements can discourage participation in deliberations (Mutz, 2006), or make deliberations more time-consuming. While multi-vocality or multiple interpretations help in tackling grand challenges (Ferraro et al., 2015), there still needs to be some common ground (Ferraro & Beunza, 2018) if collaboration is to work. Various authors have talked about finding a common definition of the issue (Ansell & Gash, 2008; Dentoni et al., 2018), shared repertoires and 'equifinal meaning' (Donnellon et al., 1986; Hassenforder et al., 2016), or an 'optimal' level of plurality (Klitsie et al., 2018).

Papers on actors' frames or cognitive representations have shown both instances where opposing frames and views have been reconciled through collaboration (Ansari et al., 2013; Reinecke & Ansari, 2015; Litrico & David, 2017) and others where they have not (Gray, 2004; Lewicki et al., 2003; Zuzul, 2019). Additionally, recent work reveals that shared frames do not preclude differing views on environmental best practices (Zimmermann et al., 2021), as mentioned earlier. Hence environmental disputes remain a conceptual puzzle in spite of the rich existing literature. We thus adopt an exploratory approach to grasping why and how individual actors disagree on environmental issues in an interorganizational context.

Revisiting the Role of Ecological Embeddedness

Organizations and individuals do not exist in a vacuum but rather are part of social-ecological systems in which ecological and organizational elements are closely intertwined (Folke et al., 2005; Ostrom, 2009). Accordingly, there have been repeated calls for interdisciplinary, systemic research linking organizations to their ecological context in Organization and Management studies (e.g. Gladwin et al., 1995; Winn & Pogutz, 2013; Whiteman & Yumashev, 2018). To date, studies on interorganizational dynamics have mainly focused on individuals'

embeddedness in diverse social contexts or institutions (e.g. Zietsma & Lawrence, 2010; Fan & Zietsma, 2017) rather than in ecological contexts. In Organization and Management studies, the terms 'environment', 'ecological', and 'ecosystems' are routinely used in a social—almost metaphorical—sense (e.g. Dacin et al., 1999). Much greater attention needs to be paid to how individuals and organizations are embedded in an ecological context on which they depend and that (along with their social context), shapes their values, norms, and practices (Whiteman & Cooper, 2000; Winn & Pogutz, 2013; Starik & Kanashiro, 2013), even in modern, highly-developed settings.

In their seminal ethnographic work, Whiteman and Cooper (2000) conceptualized ecological embeddedness as a matter of degree and outlined four dimensions for this concept: (1) personal identification with the land; (2) ecological beliefs; (3) gathering of ecological information; (4) being physically located in the ecosystem. A manager scoring high in these dimensions would thus be "committed to sustainable management practices" (p.1279). Whiteman and Cooper (2000) developed the 'ecological embeddedness' construct from their analysis of a single case, the Cree Tallymen, an indigenous community in Canada, showing a richness in their relationship with ecosystems going beyond, but including, their material interest for their livelihoods. Although their pioneering work opened the discussion on what ecological embeddedness can be, and how it can influence the creation of meaning (Whiteman & Cooper, 2011), it shed little light on differences of views in an interorganizational context. We therefore explore how ecological embeddedness manifests itself among actors involved in collaborative environmental governance. This approach is important as differences in terms of ecological embeddedness may strongly shape the actors' divergent views on their ecological context.

Methodology

Research Setting

Water issues are notorious for spawning differences in meanings among actors in interorganizational contexts (Fan & Zietsma, 2017; Kurland & Zell, 2011; Montgomery & Dacin, 2020). Our study is based on French River Basin Committees (in French, *comités de bassin*). These bodies were set up by law in the 1960s to provide collaborative governance of water resources at the scale of hydrographic basins. They involve diverse member groups such as local authorities, industrialists, farmers, fishermen, or NGO activists. Members are not elected but designated by their respective federations (e.g. Agricultural Councils) according to fixed procedures. Basin Committees are renewed every 6 years. Although they are not independent from national and European Union (EU) regulatory contexts—as can be seen with the introduction example of watermills—they are not purely consultative either. They formally debate and vote on River Basin Management Plans – which any local water-related administrative decisions must respect – as well as validate the investment plans of Water Agencies – which represent about €2 billion spent per year at the national level. As a result, among EU countries, France has been repeatedly identified as a pioneer in terms of actors' involvement in river basin governance, going beyond the requirements set out in the EU Water Framework Directive (Jager et al., 2016).

Basin Committees seek to represent all "relevant actors" of the river basin as a "function of the economic and environmental equilibria of the basin" (*Cour des Comptes*, 2015, p. 107). Members have very diverse social backgrounds and experiences of the river basin. Mainland France is covered by seven Basin Committees, two of which are covered in our paper, namely Seine-Normandie (later on, SN) and Loire-Bretagne (later on, LB). The sheer size of these river basins (for SN and LB, 94,000 m^2 and 155,000 m^2 respectively) makes them unique settings where individual members engage with other actors whom they might never otherwise meet.

These committees gather in large formal plenary assemblies of 185 and 190 members respectively.

Data Collection

Data collection took place from 2017 to 2019. Figure 1 shows the evolution of our research project through the data collection and analysis processes. We started this process with a round of informal interviews with Water Agency employees in December 2017 to validate the suitability of our project and to gain access. In 2018, we attended two plenary Basin Committee sessions, one in each river basin studied, as well as a Board of Directors meeting. Further, 35 semi-structured interviews were conducted with current or former Basin Committee members and with Water Agency managers. On average, the interviewed members had over 14 years' experience of sitting on Basin Committees. Although Water Agency managers are not Basin Committee members as such, they play an active role facilitating deliberations. They have valuable experience as third-party observers of the interactions between committee members.

[Insert Figure 1 around here]

Interviews were gathered through a mix of theoretical and snowballing sampling to catch the diversity of interest groups in the committees, both economically and geographically (see Table 1). Twenty-six interviews were face-to-face, and nine on the phone. They lasted about an hour and were audio-recorded in all cases but one at the interviewee's request. Follow-up emails were collected when needed to confirm analysis and then coded as additional input.

We also collected archive data (i.e. minutes of plenary sessions covering over 40 years of meetings for both river basins) as well as additional official reports based on recommendations from interview participants. They were not included in the coding process but helped familiarize us with the empirical context.

[Insert Table 1 around here]

The interview protocol encouraged participants to reflect on their personal experience in the Basin Committees. Anonymity was guaranteed to put interviewees at ease in sharing their views. In coherence with our initial theoretical standpoint (cf. Figure 1), questions were initially inspired by an institutional perspective (Selznick, 1949) and the collaborative governance literature (Newig, 2007; Reed, 2008). If the topic had not been raised before, a final question let them express their view on the place of the "natural environment" in deliberations.

Analysis Procedure

Given that we built on previous work, our work was exploratory yet not purely inductive but rather closer to abductive approaches. Since we sought to study individuals' links with their ecological context, a Critical Realist approach was deemed most appropriate as it allowed to embrace differences of views among actors without falling into ontological relativism or constructivism (Vincent & O'Mahoney, 2018) regarding ecological dynamics. Throughout the research project, memos were written to facilitate reflexivity and acknowledge the "central role of the researcher in approaching reality" with an "attitude of epistemological modesty" (Frederiksen & Kringelum, 2021, p.29).

As group affiliation does not tell the whole story of how each person relates to environmental issues (Brummans et al., 2008), we focused our analysis on individuals while bearing their group affiliation and the institutional context in mind (Gray et al., 2015). This was clearly stated when we invited interviewees to reflect on their individual perception and experience. The deliberation process was not our research focus; instead, we concentrated on differences in individual meanings linked to collaborative river basin governance[1]. Regarding the coding process, we transcribed interviews verbatim and coded them with NVivo, working back and forth between the literature and the data. Our coding process is described in the next section. We did not find any significant differences between the two river basins during our analysis

and therefore our findings are common to both. To ensure that the data conceptualization did as little "violence to experience" as possible (Pratt, 2008, p.499), a 25-page report of the findings was sent in June 2019 to our participants and to experienced Water Agency employees, including the archetypes presented later in this paper. The feedback received supported our core findings.

From Data to Findings

We went through a first round of broad open coding of the interview transcripts (Strauss & Corbin, 1998). As this first coding round was close to the data, the codes could be either in French or English. This first stage of analysis confirmed the theoretical relevance of ecological embeddedness in our context. Indeed, emerging codes referred to actors 'living' ecological contexts (e.g. code "Fishing Activity"), being emotionally attached to them (e.g. "unique identity of a physical place") and thinking about them (e.g. "aim is finding a balance"). Yet the previous conceptualization of ecological embeddedness as a matter of degree (Whiteman & Cooper, 2000) did not fully match our empirical observations. For example, the members representing conventional farmers were in frequent opposition with ENGOs in Basin Committee meetings. But both groups mentioned very strong concern for the environment in interviews. Farmers opposing ENGO members claimed to "think about the environment all the time" (#23, Agriculture) and were vocal about their specific relationship with ecosystems:

> As a farmer, my work tools are soil and water. So, I have no interest in damaging my work tools, neither the soil nor the water. So I tried to explain to people – extremists – who said: 'You have ruined everything, the soil is dead, etc.' I can't hear that because it's just not true. It is false. I have an interest in keeping the soil as alive as possible. I live from it. (#19, Agriculture)

These farmers even reported that their environmental commitment can lead to tensions with their "base", i.e. the conventional farmers, whom they are meant to represent, confirming the insights of Brummans and colleagues (2008) on the importance of the individual level.

Thus, ecological embeddedness was relevant to our context, but not the former 'extent-based' approach the literature proposed (Whiteman & Cooper, 2000). We took distance from it by treating each individual as a 'case' of ecological embeddedness to see how they differed. Interviewees differed notably in how they answered our last question on the place of 'the natural environment' in deliberations. Three kinds of answer were given. During one interview (#23, Agriculture), the member fell silent and did not grasp the question because he felt it too obvious that the answer was 'everywhere'. Meanwhile, others would say this place was insufficient, and that this neglect had catastrophic consequences. Finally, others questioned the existence of 'Nature' itself. It became clear that the disagreement between actors not only stemmed from opposing facts, opinions, or interests, but also from different experiences and visions of the river basin.

We went through the data and the codes again reflecting on these three kinds of answers. Three archetypes emerged comparing the individual cases along a selection of first-order codes identified as critical (e.g. 'intimate relationship with water', 'nature co-evolves with humans'). The three member archetypes identified among our interviewees were '*Resource Environmentalists*', '*Hummingbirds*', and '*Nature Atheists*' (cf. Table 1). Table 2 shows a selection of quotations for key first-order codes, indicating their relationship to archetypes. The archetype terminology was based on how these members presented themselves and their ideas. Overall, *Resource Environmentalists* are mainly worried about conserving water as a resource, and this often overlaps with protecting the natural environment. For *Hummingbird* members, water is much more than a resource and is greatly threatened by current practices. The term

Hummingbird [*colibri* in French] stems from a social movement begun by Pierre Rabhi. This movement prescribes a given deontological behavior when facing dire ecological issues (Rabhi, 2010) as it builds on the foundational story of a hummingbird that tries to put out a forest fire even if it knows this action to be desesperate[2]. Finally, for '*Nature Atheists*' the notion of Nature itself was irrelevant when dealing with ecological issues. They presented themselves as not believing in "nature with a big N" (#8, Water Agency).

By an exercise of constant comparison (Strauss & Corbin, 1998), the codes identified as critical to understand ecological embeddedness when comparing cases were finally aggregated in three dimensions of ecological embeddedness which will be presented hereafter in the findings section.

[Insert Table 2 around here]

Findings

The identification of the three dimensions of ecological embeddedness—*Ecological Engagement*, *Ecological Ontology*, and *Ecological Knowledge*—constitutes the main contribution of this paper, as critical to environmental disputes in interorganizational contexts. These dimensions are distinct but interrelated. In this section, we will use the three archetypes presented in the previous section–*Resource Environmentalists*, *Hummingbirds,* and *Nature Atheists*–to present the dimensions identified. These archetypes are specific forms of ecological embeddedness showing up in our data and are not meant to be exhaustive. They are not the key finding of our paper but they allowed us to pin down the critical dimensions of ecological embeddedness along which actors differed.

Ecological Engagement

We define ecological engagement as an individual's committed relationship in ecological matters. This relationship is not only felt, based on emotions and values, but also enacted. It can include an interest which is not wholly selfless and may be based on material dependence on key resources.

Basin Committee members—especially economic players—clearly have material interests in the river basins and indeed are appointed precisely for that reason. Yet material or utilitarian interests alone do not explain strong engagement with ecological matters in the Basin Committees' discussions. Members are meant and expected to represent interest groups and some receive more support and means from their groups than others to participate. That said, taking part in Basin Committees is mainly a voluntary activity undertaken in addition to members' day jobs or retirement activities. Attending Basin Committees is described as both time and energy-consuming. Members get no financial rewards, just re-imbursement of their travel costs and a free meal. Moreover, the topics discussed are technically complex and require work to prepare for meetings. Our data shows how material interests alone do not explain members' engagement with environmental matters:

> There is a motivation that must be some kind of pride in belonging to such an institution, having the impression to defend water, Nature, the environment, and so on. Otherwise they wouldn't go to all that trouble. I admire those who devote their time to that. (#22, Water Agency and State)

Like the Cree Tallymen in Whiteman and Cooper's seminal work (2000), members are expected to have a mix of self-interest and concern for 'the common good'. In Basin Committees, members lose legitimacy if they defend only their own interests. This expectation is enforced by direct comments, or passive behaviors in meetings:

> Whoever sticks to that speech [of self-interest] - and there have been some - excludes himself. And ... if he does not exclude himself *per se*, people will pay less attention to him. He'll speak because you cannot forbid it, but as he speaks, all the others will be on their cell phone, or calling their mother. (#12, Expert Member)

Beyond representing the interests of an organization, members see other reasons for attending Basin Committees. For example, "it is not financially rewarding but it's still very mentally stimulating and one meets new people" (#31, Agriculture). Intellectual curiosity is not only linked to a specific interest in water-related topics but also to a broader curiosity in engaging in a diverse, deliberative process that reveals "what is going on in the heads of others and what their motivations are" (#11, ENGO). Many members also report a sense of civic or moral duty. That sense of duty partly stems from a self-assessment of one's own competence. That especially applies to members with scientific backgrounds. Members also share a concern for the wellbeing of human populations, and more specifically for future generations.

Although members share certain sources of intrinsic motivations (intellectual curiosity, sense of civic duty), we find that they have different ways of engaging with ecological matters. When asked why they took part, *Hummingbirds* talked emotionally about water as a part of their identity, saying they have "always loved water" (#22, ENGO). *Hummingbirds* often evoke a direct physical experience of a river in their youth, via fishing or simple observation. Members in this archetype not only show a greater interest in water than in any other ecological topic but they speak of key memories linked to a specific place of a river.

Non-*Hummingbirds* might have also had contact with rivers in their childhood. However, they did not mention such memories when they explained their involvement with water topics. *Resource Environmentalists* typically claimed to have developed an interest in water later on, for utilitarian reasons. This interest goes beyond water itself to embrace the challenges it poses for society. They are mainly concerned with environmental issues in general. Finally, *Nature*

Atheists dealt with water or environmental topics during their professional careers. They did not report an emotional attachment in their initial choice of career path or in their decision to work in the Basin Committee (even though it may have arisen either before or after their appointment).

Thus, despite the shared sense of duty mentioned earlier, motivations differ greatly between *Hummingbird* members and the others, as do their emotional reactions when facing environmental issues. All members mention some sort of 'frustration' with committee deliberations at times but they accept this as part of the process of consensus-seeking. Yet *Hummingbird* members stood out, reporting despair and resignation—emotions not mentioned by individuals in the other archetypes:

> It may not be much what we do, I do not know. In this respect, I am rather pessimistic. But that does not stop me attending. How can I put it... There is the story of '*The Hummingbird'*: There's a forest fire, all the animals are watching the forest burn—you know that story, right? Well, at least I would have done what I could. That's it. So maybe it's—sometimes I say to myself, it's completely ridiculous, I should give up on everything and go fishing for as long as there are still fish. (#22, ENGO)

Ecological Ontology

By ecological ontology, we consider the distinct meanings members give to common ecological terms. This dimension of ecological embeddedness became relevant when we realized that different members had very different takes on 'Nature' and 'water'. Quite apart from having different views on objectives regarding ecological issues, members seem to disagree on what characterizes the reality of these ecological issues.

In Basin Committee jargon, the hydrological cycle (i.e. evaporation, precipitation, river flow, infiltration) is called the "big cycle" of water. Meanwhile, the "small cycle" of water is used to refer to the anthropogenic treatment system (water extraction, drinking water treatment, adduction, wastewater treatment). *Nature Atheists* conceptualize human interventions (*The Small Cycle*) and 'Nature' as being mutually exclusive. For them, ecological elements irredeemably lose their natural aspect as soon as humans start meddling with them. One could argue that humans have shaped the whole territory in some way or another and thus all aspects of *the Big Cycle*. Thus, the *Nature Atheists*' reasoning sees Nature as something that is long gone, claiming that "*the Big Cycle* is just a rag bag of hopes and things that do not exist" (#8, Water Agency).

Meanwhile, other members see the distinction between the big and small cycles as unrealistic as "there is only one cycle, the big one, the very big one" (#30, shellfish farmer). A *Resource Environmentalist* mentioned that we should get rid of the distinction altogether:

> The more global, environmental, ecological concern regarding resources, the protection of resources, is now so strongly integrated into all the subjects we discuss that ... making this distinction no longer makes any sense (#24, Local Authority).

Resource Environmentalists see Nature as shaped by humans in a negotiated interaction. This vision, especially present among farmers, sees humans as capable of either destroying Nature or of enhancing it depending on what they do:

> Nature reacts, so our job is fascinating. (#19, Agriculture)

Meanwhile, *Hummingbird*s see Nature as misunderstood and harmed by humans' actions. More notably, they see ecological elements as playing a much broader role than just providing

drinking water and raising crops. They see natural settings, such as landscapes, as vital for psychological health. Furthermore, echoing their ecological engagement through an intimate relationship with water, *Hummingbirds* see water as "the element that inherently structures an ecosystem not as a resource" (#21, Local Authority). They think of water in the context of ecosystems and the life that goes with it. They criticize other members who see water as "a sort of object, a sort of thing" (#21, Local Authority).

In this respect, *Hummingbirds* are radically different from both *Resource Environmentalists* and *Nature Atheists*, who mostly reported an intellectual interest in water and had no hang-ups about using the term 'water resources'. Non-*Hummingbirds* see the importance of water to life forms - both humans and animals alike - but they see it as distinct from that life, not attached to a place or context. By contrast, the *Hummingbirds* take water as something inextricably bound with places and the life that it supports.

Having different definitions of ecological elements implies disagreement on the facts and the issues stemming from them. Repeatedly in our interviews, we saw how 'ecological facts' could be easily seen by all but considered problematic only by some. The two following quotations show how members disregard the problematic nature of 'ecological facts' by restating the definition of ecological elements:

> What makes The Loire ... is its extreme irregularity. So, flooding is not a disaster, not at all—it's just part of The Loire. That's it, like The Nile. Egypt is the gift of The Nile; well, The Loire Valley is a gift and all that goes with it. (#21, Local Authorities)
>
> What is an invasive species? Well, it's a species that we introduced, and which takes the place of native species. I say, isn't that just evolution? It comes from far away and it took hold… Isn't it a bit racist to label species from coming from afar as 'invasive'? (#18, Industry)

In the first quotation, the member (classified as a *Hummingbird*) does not see how something that characterizes ecosystem behavior can be a problem. For him, water is always contextualized. It is just the way the river basin works. In the second quotation, a *Nature Atheist* on the opposite side does not see changes in ecosystemic characteristics as a problem in itself. To him, there is nothing natural about the river basin anymore anyway, because of the modifications already made by humans. As such, any evolution can be welcomed depending on the benefits it can bring to human populations.

Furthermore, if a member sees water as a resource, then greater evaporation is not necessarily a loss: it is just a change in the distribution of that resource in time and space. Indeed, a *Resource Environmentalist*, in explaining that water is not lost through evaporation, invoked Lavoisier and his dictum that "nothing is lost, nothing is created, everything is transformed" (#19, Agriculture). Meanwhile, if one is attached to a given ecosystem and its features (e.g. landscapes and biodiversity shaped by a particular spatio-temporal distribution of water) any change in the water evaporation pattern from that system becomes a loss. These differences of ontology can explain the irrigation disputes that have been raging for decades in Basin Committees.

Ecological Knowledge

Having looked at how members engage with and conceptualize ecological matters, we shall now delve into the cognitive aspects of ecological embeddedness by looking at how members obtain and articulate their own knowledge regarding ecological matters. Throughout the debates in River Basin Committees, everyone appeals to reason and pragmatism to defend their position. In fact, Basin Committees are regarded by participants as 'Water Schools' in which scientific knowledge and expertise are prized and expected to shape decisions. Taking part in

the meetings gives access to a lot of scientific information, which gets integrated with 'local knowledge' through the discussions:

> The strength of Water Agencies lies in their members, who come from all over the area, with a real territorial representation. [...] [The members] have that vision, having some familiarity with the documents, and also knowing their land, their territory and its environmental issues. (#31, Agriculture)

The local knowledge that members gather on ecological issues is mediated by their ecological engagement, i.e. their physical and emotional relationship with their land, as well as by their ecological ontology:

> Listen, I am a fisherman, I see environmental deterioration. I see. I fish. I have been fishing [in the same place] for 40 years. […] I have seen insect hatchings dwindle little by little; we are overrun by aquatic plants because nitrate and phosphate levels are too high, and so on and so forth. (#22, ENGO)

Since the river basins studied are very large, those dwelling in them do not relate to the whole river basin as a territory they belong to. Yet by participating in meetings, members get a broader understanding of the basin through their social and physical activities (getting information, talking to actors from other parts of the basin, travelling to the meetings, going on field trips).

> We know our own projects. We try to know those of others—not only to look at them on paper but to discover them in the field and meet people. It's not superfluous. (#1, State and Water Utility)

But the space given to scientific information and local knowledge in Basin Committees is not enough to get members to agree on what is happening in the river basins (diagnosis) and what decisions should be taken (prognosis). Despite being long exposed to the same information (often for decades), members still come up with divergent diagnoses of their river basin, as the following comments make clear:

> You have things that nobody says and that I spend my time saying. [...] The rivers have never been this clean in France. (#6, State)
>
> Back in 1964 and even before that, the environment was in a far better state than now. (#11, ENGO)

There are also opposing statements on the feasibility and outcomes of environmental action. The most notable example is water retention in agriculture to adapt to climate change. In the end, those ecological statements are the 'truth' if one reads them with the corresponding ecological ontology, echoing a member's comment that "everyone has a truth" (#12, Expert Member).

These differences come to a head when it comes to ecological prognoses. A central divide among members is on the necessary timeliness of environmental solutions. Unlike other members, *Hummingbirds* stress that there is a time constraint, that ecosystems are at breaking point, and that present' changes in regulations and practices are too slow to stave off disaster:

> Constant consensus ... really allows things to be pfff ... extraordinarily slow. [...] There is no avoiding it but it does not change things. Not fast enough. (#30, shellfish farmer)

This 'gloom and doom' is tightly related to the particular emotional attitude of *Hummingbirds* in their ecological engagement. They battle in Basin Committees with a fervor

born of the belief that ecological collapse is at most just a few decades away. It is quite telling that, wholly unbidden, two of the *Hummingbirds* interviewed took the liberty to directly question the ability of our first author, younger than them, to have offspring likely to survive:

> My children have come of age and will make it but I am not sure that yours will be so lucky (27, ENGO).

By contrast, to *Nature Atheists* and *Resource Environmentalists*, ambitious ecological goals are not a means of avoiding ecological collapse but rather a way to improve the present. They therefore seek incremental steps while being attentive to societal and economic requirements.

> May everything be beautiful; may everything look clean. We have to take care of everything right now, etc. It's ... well, it's unreasonable. (#5, Industry)

Many of these members have an optimistic outlook regarding the evolution of ecological conditions, stressing the progress accomplished. More importantly, even when they acknowledge the positive ecological impact that radical regulatory changes would have, they see incremental consensus as the only possible way. They "believe more in small steps than big ones" (#12, Water Expert). Other members slated the *Hummingbirds*' demands as unreasonable, Utopian, and unnecessary. Yet from the *Hummingbird* standpoint, perpetuating the *status quo* is both unrealistic and impossible. Where *Hummingbird* members see an ecological boundary looming in the future, other members see social or economic constraints in the present.

Facing other Forms of Ecological Embeddedness

Regardless of their deep disagreements on water issues, interviewees reported "[…] a shared culture, […] that isn't necessarily shared once we go outside Basin Committee members" (#9, Water Agency). As members of Basin Committees, they repeatedly meet both in formal and informal ways, i.e. in plenary sessions and during the meals organized afterwards, unanimously outlined as an important part of the process. As a collective, they accepted common rules on legitimate topics and manners. This set of spoken and unspoken rules ensures respectful deliberations aiming for consensus and for the 'common good'. To that end, new members must learn to take a "constructive approach". Our field observations show that, even when thorny topics are discussed, a spirit of "courtesy" and even humor are expected. Yet, despite the consensus-seeking rules, lasting tensions are reported that do not seem to lessen with time:

> In the end, it's still a lot of time for limited results in terms of mutual understanding. Anyway, perhaps it's just the price of democracy as they say. It's also true that we often end up discussing the same topics. (#26, Industry)

Nevertheless, these hurdles do not cast doubt on the Basin Committee's legitimacy:

> So when it comes to the frustration we might feel about voting. There, we can ask ourselves: "The fact of giving weight to the stakeholders, can that one day lead to the solution?" That's a big question mark for me but I am sure we must include them. (#11, ENGO)

When faced with disagreements, Basin Committee members maintain their positions by using an *ad hoc* dualist discourse which contraposes the 'truth' (their position) with others' beliefs and opinions. When confronted with facts they do not agree with, members not only answer by opposing contradictory facts but also by questioning the validity of the scientific information presented in that particular case, for example by arguing that it: "[…] draws on

highly specialized knowledge of machinery that overlooks real-world complexities" (#11, ENGO). Indeed, the uncertain and unpredictable nature of river basins offers endless scope for questioning 'facts'. Impending climate change (which everyone expects to pose new ecological threats) only increases these uncertainties. Thus, amassing and conveying scientific information is not enough to reach common definitions of ecological problems.

> We have proposed a dam project that would let fish migrate for three months a year. The environmentalists say: 'Yes but in 20 years, how do we know it will still be three months?' The answer is nothing. In 20 years neither you nor I will be here and there may be no fish left in the river anyway. (#18, Industry)

Basin Committee members acknowledge that there are other ecological ontologies than their own in deliberations but dismiss them in strong terms, for instance as "[…] extreme dogmatic visions" (#23, Agriculture). Conflicting opinions are then discarded as irrational or dishonest, as a 'belief' or even as a flat denial of scientific truth:

> There are people who dare call you a liar in front of everyone else. They say that dams provide fresher, better water, and so on. When that happened, I thought I was in the USA with a bunch of Climate Deniers, or Creationists. I think those must all believe that the Earth is flat. (#35, Professional Fisherman)

When confronted by approaches to ecological topics that differed from their own, all Basin Committee members were swift to put them down as ideologically motivated. In the interviews they dismissed their opponents as 'technocratic lunatics', 'ayatollahs', 'fanatics', or even 'Green Khmers' (a reference to Cambodia's infamous *Khmers Rouges* [Red Khmers] and Pol

Pot's genocidal dictatorship). By contrast, a member from another group could still be valued positively if he was seen as "non-sectarian" (#15, Local Authority).

These observations are surprising coming from members who have been exposed to opposing views for many years. Sustained participation in deliberations did not lead to less pejorative perspectives on diverging opinions.

As we have shown in this section, differences in ecological embeddedness hinder agreement on key issues among Basin Committee members. Members endlessly retrace the same deep-rooted disagreements on such subjects such as water retention infrastructures. To defend their position, members resort to *ad hoc* discourses that set their 'truth' against others' opinions and beliefs, alternatively questioning the validity of the scientific data and arguing for a more 'scientific' approach. Such posture partly is enabled by the irreducible complexity and unpredictability of water systems. Their shared commitment to water topics led to a shared appreciation of the Basin Committee and its deliberations but failed to overcome disagreements on ecological issues.

Discussion

This paper outlined the main components of ecological embeddedness in a modern interorganizational setting (involving ecological engagement, ecological ontology, and ecological knowledge), exploring how actors involved in French River Basin Committees are linked to their ecological context. We also saw how disagreements drag on with the use of *ad hoc* dualist discourses on truth and beliefs, despite members' long-term commitment to collaboration and exposure to scientific information. Such limited approach to deliberations turns the diversity of forms of embeddedness into a weakness rather than a strength.

Forms of Ecological Embeddedness as a Tool to Embrace Complexity

The paper's first contribution is that ecological embeddedness is a matter of form and not of extent—as previously conceived by Whiteman and Cooper (2000). Treating an actor as ecologically embedded or not (or more or less embedded) yields few insights when studying the complex processes of collaborative environmental governance (Ansell & Gash, 2008; Innes & Booher, 2016). Furthermore, presenting ecological embeddedness solely in terms of extent might add to conflicts rather than help in overcoming them as it would make actors vie with one another to show they are 'more embedded' than the rest. From a collaborative governance perspective, failing to take differences of ecological embeddedness into account can lead to lasting disagreements and conflicts that would not fade away with the emergence of a shared logic (Ansari et al., 2013). Such conflict can persist in spite of a shared cognitive identity frame (the "basin committee member" or "water people" identity) and process frame (shared consensus-seeking rules) (Dewulf et al., 2009).

Our data let us identify the three dimensions (i.e. engagement, ontology, knowledge) along which the different forms of ecological embeddedness manifested themselves. In their seminal work, Whiteman and Cooper (2000) had previously outlined four important dimensions of ecological embeddedness, namely *personal identification with the land*; *adherence to ecological beliefs*; *gathering ecological information*; and *being physically located in the ecosystem*. They proposed that managers scoring high on these four dimensions would have stronger commitment to sustainable management practices. Although these dimensions had obvious value to introduce the notion of ecological embeddedness, they did not help explain differences of views in our interorganizational context. For example, in basin committees, members could be have the same level of personal identification with the river basin, yet disagree on diagnoses and prognoses regarding this same basin. In a critical realist approach, we believe our new conceptualization adds to Whiteman and Cooper's by travelling further

between local and general knowledge, in an effort of approaching (although never capturing) objective reality (Frederiksen & Kringelum, 2021). We do so notably by adding the distinction between the ecological ontology assumed/adopted/embraced by actors and their ecological knowledge.

The three dimensions identified are deeply intertwined and need to be looked at as a whole. In our empirical context, we can clearly see (1) how ecological engagement and ecological ontology are closely related. Indeed, the actors build a relationship with ecological elements to which they attach a certain meaning. In the case of *Hummingbirds*, their intimate relationship to "water" is tied to them seeing water as more than a resource, as being inseparable from places and life. Additionally, we can also see (2) how ecological engagement and ontology both impact ecological knowledge through local experience and epistemological approaches. Regarding the influence of ecological engagement on ecological knowledge, we saw for example how some members drew their stance on biodiversity decline from their long-standing fishing experience. Additionally for the link between ontology and knowledge, we showed how actors build different statements, notably on the ecological state of the river basin, having different "definitions" of ecological elements in mind. We believe more interrelations are yet to be uncovered among these dimensions. These dimensions are critical to environmental disputes but have as yet been little studied or examined only separately in interorganizational contexts. Again, the archetypes presented here—'*Resource Environmentalists*', '*Hummingbirds*', and '*Nature Atheists*'—are three extreme cases of forms of ecological embeddedness which let us uncover the dimensions and are not meant to be exhaustive. They are arguably influenced by the empirical context of our study, not only culturally (i.e. a Western setting) but also ecologically (e.g. temperate climate). Nonetheless, they may be relevant in other empirical contexts for comparison purposes.

Dealing with Environmental Disputes in Organization and Management Studies

In participatory processes, Selznick (1949) warns us against the dangerous drift of organizational goals when these include "unanalyzed terms". The management literature often focuses on companies' efforts as turning to measures that are "greener" or more "sustainable" (e.g. Martinez, 2015), or talk about taking an "environmental" cognitive approach (e.g. Zimmermann et al., 2021). This terminology risks oversimplifying ecological issues, assuming that what is 'better' or 'worse' for ecosystems is univocal, and that actions can clearly be classified as being 'good' or 'bad' in this regard. Our analysis shows that this is usually not the case, even among trained experts, and that such conceptions of environmental issues offer little insight about environmental conflicts.

In our empirical context, Basin Committee members are exposed to the same scientific information for years (and sometimes decades) as well as to a representative range of the interests and opinions of other actors with whom they share the river basin. Although they developed a shared understanding of how deliberations should work and even a shared feeling of belonging to the Basin Committees, they have not come to a shared understanding of the river basin itself or reached a shared definition of the issues (Hoffman, 1999; Harley et al., 2014). They continue to disagree on what constitutes good environmental management practices. They do not just disagree on the accuracy of statements regarding ecological issues; they also disagree on the interpretations that can be made from those statements and on priorities. Although one cannot rule out conflicts of interest, our data shows how environmental disputes have deeper material, emotional and cognitive roots. It shows that the influence of ecological engagement and ontology persists through the process of knowledge acquisition.

By showing the diverse forms ecological embeddedness can take and the conditions of uncertainty and complexity in which experts form opinions on ecosystems, our paper contributes to the thickening of environmental concepts in the Management and Business Ethics

literature (Islam & Greenwood, 2021). If expert members themselves emphasize the many trade-offs and the complexity of environmental decisions (cf. the example of water mills both as hurdles to biodiversity and as sources of renewable power), then organizational scholars should go beyond treating decisions and actors as simply "green" or not.

Implications for Collaborative Environmental Governance

The fact that actors in a social-ecological system have different forms of ecological embeddedness does not of itself pose a hurdle to collaborative environmental governance. On the contrary, such diversity of experience is why such collaborative processes are needed in the first place (Wondolleck & Yaffee, 2000; Harley et al., 2014), and they can be a strength in tackling 'wicked problems' (Ferraro et al., 2015; Arenas et al., 2020). But if the actors stick to an *ad-hoc* dualist separation between truths and beliefs in the hope that scientific information will rescue them from endless disagreement and deadlock, they are likely to be disappointed. This member's reaction to our feedback report shows how praising Science allows contrary views to be passed off as unfounded 'beliefs', making it hard to reach consensus:

> Although I am a '*Hummingbird*', I am not a 'believer' in the environment or water specifically, even though I have an emotional relationship to water. I try to use science not to defend that relationship but instead to defend the water that provided that emotion. [...] The "atheists" are the true believers because they think 'Progress' will solve everything. It's just another faith. (#22, ENGO)

In other words, members resort to scientific knowledge to support a view linked to a particular form of ecological embeddedness and to delegitimize the position of others, who are embedded in other ways. Yet the complexity and unpredictability of socio-ecological systems (e.g. Rice, 2013) means that members cannot hold holistic views on regulatory decisions by

relying solely on scientific information. Indeed, the ecological outcomes of environmental measures (such as restoration schemes) are often hard to assess (e.g. Morandi et al., 2014). Furthermore, natural sciences cannot answer the questions raised in the clash between different visions of what human societies need from a river basin and other ecosystems. Indeed, agreeing on a problem definition "presupposes some expectations of what the world ought to look like in the first place." (Sarewitz, 2004, p. 386). Even if members agree on some of the facts, different aspects of social-ecological issues can be stressed, interpreted in different ways, based on different ontologies. Thus, our findings underline how natural sciences alone cannot reveal with absolute certainty which practice is ecologically 'good' or 'bad' or even what a "problem" is. Despite being indispensable, we cannot expect additional scientific information to fully inform collaborative environmental governance (Sarewitz, 2004; Lejano & Leong, 2012; Van Poeck, 2019).

Echoing previous studies on 'wicked problems' (Harley et al., 2014; Innes & Booher, 2016; Dentoni et al., 2018), our research underlines the importance of integrating diverse values and knowledge types in environmental management (Kenter et al., 2019; Raymond et al., 2010). Our results on the dimensions of ecological embeddedness show how members not only need to talk about their respective ecological knowledge in deliberations (as they currently do) but also about their ecological engagement and ontology. To do so, Basin Committees and other cases of collaborative environmental governance need to open their agendas not only to discussing which practices should be allowed and financially supported but also to freely sharing how each member relates to the river basin/constituent ecosystem in physical, emotional, and cognitive terms. So far, this kind of exchange in Basin Committees has only been possible at an informal level, outside committee meetings. We believe it should be further legitimated and more actively pursued, notably via value deliberation exercises (Kenter et al., 2016) or by integrating different kinds of knowledge (Raymond et al., 2010). This would let

members see their opponents not as mere 'believers' but rather as individuals living with a certain internal coherence, in terms of engagement, ontology, and knowledge within shared social-ecological systems. In the long run, we believe such exchanges could lead to much greater trust and social learning (Leach & Sabatier, 2005; Pahl-Wostl et al., 2007).

Limitations and Future Research

The notion of ecological embeddedness is promising to understand environmental disputes, but much remains to be studied in that regard. In-depth qualitative work is still necessary on this topic, with projects preferably favoring field and longitudinal observations. Such studies could notably focus on the interrelations between the three dimensions of ecological embeddedness identified, or on the relation between an individual's ecological and social embeddedness. Indeed, being part of an organizational or institutional context implies exposure to certain experiences shaping the individual's relationship with the ecological context. One additional point to bear in mind is that those who took the time to take part in this study might also be those most committed to river basin institutions. There may be others who are unwilling to take part in this kind of research project or whose form of embeddedness precludes participation in Basin Committees. Studies on ecological embeddedness with different sampling approaches, or in different social-ecological contexts – for example in cross-national comparative studies – would allow further refinement of our conceptual contribution. Going beyond the focus of this study, future research could explore the relationship between broader politico-economic conditions (such as levels of power imbalances or of economic development) and different forms of ecological embeddedness.

We limited our study to the individual understanding of environmental problems. Nonetheless, further research is needed to link those forms of embeddedness to different interorganizational dynamics. One needs to know how certain collaborative process designs

could help attain desirable collaboration outcomes (e.g. social outcomes such as trust or social learning, or ecological ones such as ecosystem restoration). To that regard, this paper has shown how local experience plays a special role in actors' ecological embeddedness, notably in their ecological engagement and ontology. Future research could delve deeper into how direct exposure to certain biophysical settings influences forms of ecological embeddedness, and how differences in individual experience should be acknowledged in deliberations, in order to make collaboration and participatory mechanisms more adaptative to ecological contexts.

Conclusions

Our study re-conceptualizes ecological embeddedness in a way far removed from the extreme case of the Cree Tallymen offered by Whiteman and Cooper (2000). This renewed understanding of ecological embeddedness helps to untangle the complexity of environmental disputes in collaborative governance settings. We find that 'modern' Western actors, while less exposed to pristine ecosystems, are still ecologically embedded but in different ways. Different forms emerge, along three critical dimensions—ecological engagement; ecological ontology; ecological knowledge. Because of these different forms of ecological embeddedness, disagreements and misunderstandings on ecological issues can persist in collaborative environmental governance in spite of shared organizational goals, agreed procedures, and scientific information. This is why protocols need to be drawn up to help members reflect on and share not only their respective ecological knowledge but also their ecological engagement and ontology.

Endnotes

[1] We do not delve into how differences of views or of resources among actors play out in terms of power dynamics in deliberations. We believe that the complexity of this topic warrants separate analysis and a distinct methodological approach if we are not to risk sacrificing depth to scope.

[2] The full version of the *Hummingbird* story is as follows: "Legend has it that one day there was a huge forest fire. All the animals were terrified witless as they watched the disaster unfold. Only the tiny hummingbird was busy, fetching a few drops of water in its beak to dribble on the fire. After a moment, the armadillo, annoyed by this flitting to and fro, scolded him: 'Hummingbird, are you mad? You won't put the fire out with those tiny drops of water!' The hummingbird answered: 'I know, but I'm doing my bit.'" (Rabhi, 2010)

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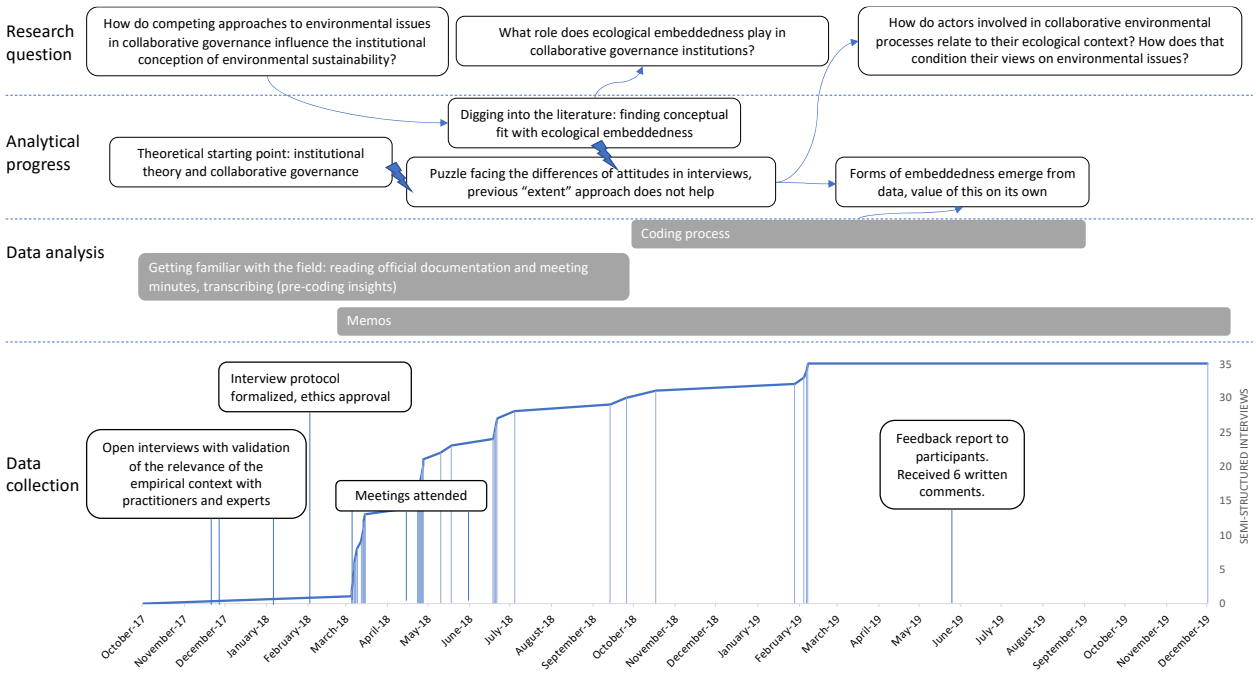
Tables and Figures

Figure 1. Data collection and analysis process



***Note**: Graphical representation inspired by the work of Montgomery & Dacin (2020)*

Table 1. List of Interviews Conducted.

Interview	Activity	Basin	Years of experience as a member	Assigned archetype
1	Water Utility & State	SN & other	3	
2	Water Utility	SN	44	
3	State & Local Authority	LB	9	
4	Water Utility	SN	20	
5	Industry	SN	24	
6	Water Agency & State	LB & other	-	
7	Water Agency	other	-	
8	Water Agency	SN	-	*Nature Atheist*
9	Water Agency	LB	-	
10	Water Agency & State	LB	-	*Nature Atheist*
11	ENGO	LB	32	*Hummingbird*
12	Expert Member	LB	10	*Resource Environmentalist*
13	Water Agency	LB	-	
14	State	LB	4	
15	Local Authority	LB	4	
16	Industry	LB	13	
17	Industry	LB	13	
18	Industry	LB	6	*Nature Atheist*

19	Agriculture	LB & SN	18	*Resource Environmentalist*
20	River Sport NGO	LB	25	
21	Local Authority	LB	7	*Hummingbird*
22	ENGO	LB	19	*Hummingbird*
23	Agriculture	LB	2	*Resource Environmentalist*
24	Local Authority	SN	10	
25	ENGO	SN	10	
26	water consumers NGO	SN	10	*Resource Environmentalist*
27	ENGO	SN	19	*Hummingbird*
28	Local Authority (seaside)	SN	4	*Resource Environmentalist*
29	Local Authority	SN	17	*Resource Environmentalist*
30	shellfish farming	SN	12	*Hummingbird*
31	Agriculture	SN	10	*Resource Environmentalist*
32	Local Authority	LB	26	*Resource Environmentalist*
33	fishermen NGO	SN	2	*Hummingbird*
34	fishermen NGO	LB	19	*Hummingbird*
35	professional fisherman	LB	19	*Hummingbird*

Note: *Some members might have characteristics that span archetypes.*

Table 2. Dimensions of Ecological Embeddedness with Quotations [Translated and adapted from the French]

Ecological Engagement	
Intrinsic rewards of participation	
Intellectual curiosity	"It's time-consuming, but it's extremely interesting so that's why I go. […] I find the way it works really interesting, I think we make progress, I learn a lot, and I mix with ... people who represent groups that I would never mix with." (#28, Local Authority)
	"By nature, I'm a bit curious, so I like it, to discover… I almost feel like I'm in school". (#33, Fisherman NGO)
Sense of civic duty	"For me, it's a double job. At the same time, I must shoulder my professional duties to my clients. That's hard when you are a freelancer. I am reimbursed for travelling costs but I get nothing for my time. So one needs see a civic purpose here because public water policies cannot be left to just anyone." (#12, Water Expert)
	"If I listened more to my wife, she would tell me, 'You're completely crazy.' [...] That's what she told me one day. Well, but it's the interest of the *res publica*, I think." (#32, Local Authority)
Concern for future generations	"And it's for tomorrow, for our children and our grandchildren. I myself have a grandchild who is four months old. What world are we going to leave him?" (#29, Agriculture)
	"It may seem pretentious but I think we also have a responsibility towards future generations. I have a granddaughter who is about 3 years old. Well, I want her discovering something else about water and natural environments than channeled streams, putrid water, putrid streams clogged with

	cyanophycea [cyanobacteria] in summer, green, in which we will not be able to bathe." (#34, Fishermen NGO)
Commitment and pain *Marker for Hummingbirds*	"I say all that but I do it anyway and I ... knew what I was getting into. But at some point, you see, what's the return on investment? [...] So, I think that I will decide at the next call for members but that will be ... it will be really with a heavy heart." (#33, Fisherman NGO)
	"He is going to stop or so he says but he is still at it. I think he can't give it up. Anyway, it's true that there are days when he is thoroughly fed up with it. He's a bit ... pessimistic right now." (#22, ENGO)
Reported origin of first involvement with river basin management	
Intimate experience with a river *Marker for Hummingbirds*	"I ended up in water from a very young age, as a child. It's a bit like the way salmon recall their spawning grounds for life. Well, the same goes for me, I took to the water from a very young age." (#11, ENGO)
	"I think water is in my guts. In fact, I fell in it when I was very young. Well I always used to say that I took to water by chance but thinking back, it wasn't. One day I played - I went to my grandparents' place deep in the country and I started to lift the pebbles in a very small stream to see what was going on in the river and so on. That's how I ended up as a fisherman." (#34, Fisherman NGO)
Concern for impacts of environmental problems on human populations *Marker for Resource Environmentalists*	"The oil crisis made me think about the big shocks that would hit society in the coming years. I quickly realized that after oil, it would be water. So, I took a closer interest in water issues and the consequences that there were ... in terms of pollution but also in terms of scarcity." (#32, Local Authority)
	"It's more than water. It's everything related to environmental challenges, water, air, and climate. Today I do a lot regarding climate. There are all these topics around agriculture, the pressure of agriculture, the land, the work of the soil, the life of the soil." (#31, Agriculture)
Professional path *Marker for Nature Atheists*	"It was a professional requirement, because they worked with the Local Authorities, and we were at the service of the Local Authorities." (#4, Water Utility)
	"I wanted to discover the corporate world to expand my experience at the time. I was then contacted to join [a Water Utility company] [...] I liked it a lot and it won my heart for the rest of my professional career until today." (#1, State and Water Utility)
	Ecological Ontology
What is nature?	
Nature and humans are mutually exclusive *Marker for Nature Atheists*	"The natural environment does not exist anymore. We no longer have a natural environment in France." (#10, Water Agency)
	"I react to the word 'natural environment': Humans have been artificializing the environment for the last two millennia or more so we have to stop saying that we want to return to a natural environment ... [...] We can't turn the clock back." (#18, Industry)

Nature co-evolves with humans *Marker for Resource Environmentalists*	"In the Aube area, we have water reservoirs, the Seine and the Aube Lakes, which were created to protect Paris from floods and to maintain the flow of the Seine and Aube rivers during droughts. Those are artificial reservoirs that used up roughly 5,000 hectares of land and forest and today they have been turned into Nature Reserves." (#29, Local Authority representative but a farmer by profession) "When we build water storage infrastructure, we need to look at the impact of this infrastructure on the environment, both positive and negative. That's because when you make infrastructure there is an impact ... also a positive one." (#23, Agriculture)
Nature is vital to humans but mistreated *Marker for Hummingbirds*	"It's not only water issues, it's also biodiversity and species, and then also of ... having pleasant environments and landscapes. You have *bocage* [banked hedgerow] countryside, even if it is not dense *bocage*. Go to Beauce to see what it looks like. It's rather sad in November when it is foggy. No wonder there are farmers who shoot themselves. It's sad. It's - how to say - naked. It's empty." (#11, ENGO) "The industrial system in general but especially the industrialization of agriculture, has destroyed the old bond between Mankind and The Earth." (#22, ENGO)
What is water?	
Water inseparable from an ecosystem *Marker for Hummingbirds*	"In fact, water is a mystery. There is what is above water, and then there is what lies below the surface. We do not always see things even when the water is clear. Mystery lurks beneath the surface." (#11, ENGO) "If you defend water, you defend the fish life, you defend everything that goes with it." (#22, ENGO)
Water as H_2O *Marker for Resource Environmentalists and Nature Atheists*	"There is a very special feature of water, —how shall I put it?— it's never consumed. We never lose water. It's only transformed. […] It's useful to many things; it's never lost. One must always bear in mind that water is a zero-sum equation." (#24, Local Authority) "The balanced, harmonious, sustainable management of both surface and sub-surface resources, renewable or fossil, and their many economic, social and cultural uses requires all disciplines." (#1, State and Water Utility)
What is a problem?	
Questioning the problematic nature of facts	"I met people from the FNSEA who still tell me [...] 'There will be enough water but it will be badly distributed through the year'. What a blinding insight! 'Water is poorly distributed throughout the year.' It's true but it's a stupid comment. Snow is also really badly distributed throughout the year, it's very stupid—again, it's daft. Just imagine how smart it would be to spread snow better through the year." (sarcastic tone) (#21, Local Authority) "I had just shown them a presentation made by IFREMER where you could see the nitrate flows coming out of The Loire like this and around the whole of Brittany, reaching as far as the North Sea. He told me 'In any case, the sea does not need fresh water.'" (#22, ENGO)
Ecological Knowledge	
Ecological diagnosis	

Impending doom *Marker for Hummingbirds*	"The human species must ... do more—well do more than now. Whether it is global warming or the protection of biodiversity, we need to do more because there will soon only be us left on this planet and it will no longer be habitable." (#27, ENGO)
	"In the end it's a disaster—it already is in some places. [...] We foresee non-linear changes when it comes to climate change forecasts, the extrapolations are certainly not linear, which means that things are going to get worse fast." (#11, ENGO)
Optimistic outlook *Marker for Resource Environmentalists and Nature Atheists*	"Overall, the European indicators show that we have damaged water bodies but if you look at the trend in our region—something that Europe doesn't want us to do, the picture is highly positive." (#12, Water Expert)
	"I am fairly optimistic about the environment. I think there is a pro-environmental movement, which is irreversible and necessary. I think that there has been an awakening, and that we have indeed wrought too much nonsense on this planet." (#32, Local Authority)
Ecological prognosis	
Incremental change is the only way *Marker for Resource Environmentalists and Nature Atheists*	"I always say to make sure that the step is not too big. We're not here for fun, we're here to ... help as many people as possible adopt better systems." (#31, Agriculture)
	"I believe in Progress, something that is never fast enough for some when it comes to delivering well-being. I share this view with some members—including extremists—but we shouldn't bury our head in the sand. It is the only way we can make progress." (#12, Water Expert)