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The Failure of the Largest Project to Dismantle Hydroelectric Dams in Europe? (Sélune River, France, 2009-2017)

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ABSTRACT: The removal of two hydropower dams announced by the French government in November 2009 would have been an unprecedented operation at European scale due to their dimensions (36 and 16 m high). But this project has been strongly criticized at local level by elected officials and users. The Actor Network Theory is used to reconstitute the successive stages of the consultation process, from the first discussions about the future of the dams (2005) to the downgrading of the project (2016), finally leading to a simple draining of the lake and inspection of the dam. The ANT approach and the methodology based on stakeholder interviews and participant observation are fruitful to identify the actors – humans and non-humans like salmon or lakes – and to analyse their position in sociotechnical networks pro or against dam removal. This method aims to reconstruct the whole process of setting up the campaign groups and their trajectory and to understand the shaping of representations and values. It shows the opposite visions developed by the opponents and defenders of the dam concerning salmon and running/standing water. The way the dialogue process was conducted also plays a crucial role. Interrupted and characterized by many uncertainties, it failed in allowing a translation between expertise and local knowledge.

KEYWORDS: Dam removal, Actor Network Theory (ANT), micro-politics, governance, France

INTRODUCTION

The restoration of ecological continuity is the most symbolic, but also the most conflictual part of the ecological restoration of waterways. It involves removing dams or weirs built across rivers and is aimed at restoring the free movement of migratory fish and sediment. So far, most dam removals have taken place in the United States (Hart et al., 2002; Grant and Lewis, 2015). At the end of 2015, nearly 1,300 dams had been dismantled (O'Connor et al., 2015) at a rate of approximately sixty a year since the end of the 1990s (Service, 2011). Only 29 of them were more than 10 m high, with 4 above 30 m.¹ The best-known case of such big dam removal is probably the Elwha Dam (33 m) in Washington State, dismantled in 2011 (Mapes, 2013; Crane, 2011; Guarino, 2013). Although the dismantling of dams did have the expected ecological restoration outcome, namely the recovery of ecological continuity, the respect of relicensing regulations in accordance with endangered species protection was not the only legal driver. In fact, structural obsolescence of dams and safety regulations were also often decisive factors (Bowman, 2002).

¹ www.americanrivers.org/threats-solutions/restoring-damaged-rivers/dam-removal-map/

In Europe, the dismantling of such barriers tends to be institutionalized (Bouleau and Pont, 2015) and the relevant regulations have been included in river restoration textbooks for many years. All EU member states have to achieve good qualitative status of water bodies as defined by the European Water Framework Directive (WFD) in 2000 and the integration of this Directive into French law in 2006 sees the ecological continuity of waterways as one of the best ways of attaining this water quality in rivers (Germaine and Barraud, 2013; Germaine and Barraud, 2013a, b). To date the French policy has been the most ambitious (Lespez and Germaine, 2016). Amongst 80,000 obstacles (dams, weirs and small barriers), the dams which have been or are in the process of being dismantled are, on the whole, relatively small. Only one big dam was completely dismantled in 1996 (Kernansquillec Dam, Brittany, 15 m high) for safety reasons. The announcement by the French government in 2009 that two big hydroelectric dams were to be removed from the Sélune River, in the North West of France, opened up the prospect of a dismantling operation on an unprecedented national and European scale.

Much human and social sciences research work has been done on dams in countries of the global South where several studies have been carried out on the consequences of dam construction on the most vulnerable populations (e.g. WCD, 2000; Sneddon and Fox, 2008; Tilt et al., 2009; McCormick, 2010). In Western countries, research is more centred on dismantling projects, analysed from an ecological angle (e.g. Bernhardt et al., 2005). This article is closer to another body of research which highlights the social and territorial dimensions stemming from ecological restoration projects (e.g. Egan et al., 2011; Lave, 2012; Clewel and Aronson, 2013). Even though many of the dams concerned were small and with no economic utility, the decision to remove them caused much opposition and has been well documented in the USA (Born et al., 1998; Fox et al., 2016; Magiligan et al., 2017) or Europe (Eden and Tunstall, 2006; Lejon et al., 2009; Germaine and Barraud, 2013b; Emery et al., 2013). This body of research points to the cultural and historical dimensions of opposition, as well as highlighting the symbolism of the dams in terms of a local history that people identified with (Fox et al., 2016). Opposition could also be seen in the diverging representations of nature, as clearly revealed both in the interviews with local residents (Tunstall et al., 2000; Junker and Bunchecker, 2008; Buijs et al., 2009; Fox et al., 2016; Germaine and Barraud, 2013b; Sherren et al., 2016) and in the media analysis (Jørgensen and Renöfält, 2013; Flaminio, 2016). Research has also been carried out into the dismantling of larger dams (over 15 m), illustrating how difficult it is to formulate a removal plan which brings together community needs and what is at stake ecologically (Vogel, 2008). In the United States, these dimensions are often associated with the struggles of Native Americans to recover their rights of access to natural resources, as demonstrated for example by J. Guarino (2013) in tracing the long process that led to the removal of the Lower Elwha Klallam and the Elwha Dams (Washington).

In this article, based on the Actor Network Theory (ANT) approach, we will follow the construction of the ecological restoration project on the Sélune River with the reaction of local people involved. More precisely, the purpose is to analyse the dialogue taking place from the announcement of the dismantling of the dams in 2009 right through to its downgrading in 2016, when dismantling became a simple draining of the lake and inspection of the dam. After presenting the methodology and the study area, monitoring and analysing the negotiation process enabled us to identify the stakeholders involved and to discuss the role of non-human actors in the campaign groups such as dams, the lakes attached or salmon. Then, we focus on the obstacles encountered during the dialogue, i.e. the interruptions and uncertainties in the process and more fundamentally the difficulty of translation between expertise and local knowledge that reveal a spatio-temporal perspective analysis. Finally, the failure of this project appears not only as the downgrading of the project (maybe provisional) but more widely as the failure of the construction of a shared environmental project. This is compared with other research work into the social dimensions of dismantling dams and weirs.

CONCEPTUAL FRAMEWORK AND METHODOLOGY

ANT, non-human agents and path of dialogue

Political ecology studies are often dedicated to water conflicts highlighting the role of social movements and power relations (Rodriguez-Labajos and Martinez-Alier, 2015). This approach is fertile to analyse conflicts between insiders and outsiders about dam removal for example (Fox et al., 2016). Following this, a first study was conducted on the conflict caused by the project of 'renaturing' the Valley of the Sélune. It retraces the different usages of the Valley, from energy production to the implementation of the ecological project and highlights the opposition between the higher level authorities (French State) whose aim was to promote ecological restoration and the residents who were mostly hostile to the disappearance of these dam lakes (Germaine and Lespez, 2014). In this article, we will provide further analysis focusing on the recent period which takes into account the situation at the beginning of 2017, when the opposition to the dismantling works announced in 2014 became clearly visible.

The increasing complexity of the Sélune debate has convinced us to use the ANT approach. Firstly, we did not want to reduce our analysis to an opposition between insider and outsider narratives. As the success of a project also depends on the process it relies on and the network that carries it (Latour, 1991, 1999), we have decided to analyse the setting up of sociotechnical networks and their mobility in the conflict. This is crucial to understand the changes of power relations during a long dialogue process as the Sélune case. Secondly, water management, as environmental issues in general, concerns non-visible or mute living things, such as rivers or the fauna which lives in them. The sociology of translation (Akrich et al., 2006) can be of help in showing how some non-human actors could be used by other actors, acting as spokespersons. Our aim is to identify the role of each of the agents involved and the way they enlisted other actors over time to defend or oppose this project. More particularly, we will analyse how some of the actors put themselves forward as spokespersons for mute entities such as fish or rivers (Gramaglia, 2008). Through a series of successive translations, these spokespersons helped bring the sides together, thereby moving the initial debate forward and, in this respect, they played a crucial role. Because the main characters (the State, anglers or residents) use very different values and even language (Beuret, 2010), translation allows apparently irreconcilable statements and stakes (Callon, 1991) to come together, such as, well-being, energy performance or the quality of the natural environment. In order to understand the emergence of the debate and the way it developed, we have relied on J.E. Beuret's research (2011) into paths of dialogue which enabled us to reconstruct the initial parameters of the problem and the interactions between the groups over time. The process of dialogue is understood as being a "process of collectively constructing visions, aims and a common project with a view to acting and deciding together" (Beuret, 2006). In environmental matters, dialogue in public spaces aims at solving conflicts or even crises that authoritarian management cannot. Some of these dialogues, initiated by the public authorities, take place within a relatively formalized framework and are restricted to selected actors. Conversely, other spaces of dialogue, more spontaneous or even alternative, are totally independent of the State. In both cases the dialogue is a result of a collective definition of a problem and finding cooperative solutions. Rebuilding these paths of dialogue also aims at explaining the complexity of the negotiation process that does not always conform to a strict procedure and is often subject to twists and turns. There is a need to understand the ways in which social networks interpenetrate each other and different social situations are superimposed upon each other, as well as taking into account the legacy of the past. The path of dialogue renders this complex form of consultation in the form of a tree which consists of (Beuret et al., 2006):

1. a seed corresponding to an event which is identified by the protagonists and triggers the reason for the consultation;

2. roots which represent the network of participants engaged in the dialogue. The actors are grouped into broad categories – e.g. elected representatives, farmers – who are explicitly identified by the respondents.
3. a central trunk, reflecting an organized dialogue based on the identification of a language and common values
4. branches representing the enlargement of the stage of consultation to other stakeholders or other spheres;
5. and lastly, of fruit, which are the tangible results of the dialogue.

Participant-observation, interviews and discourse analysis

The project stages set up for discussion were done so from inside by means of an observation-participation approach. Firstly, we took part in drawing up a sustainable development plan of the Valley of the Sélune organized by the consultancy firm ETHEIS – mandated by the County Authority of Land and Sea of La Manche² – between January 2011 and early 2013. Secondly, we took an active part in two series of workshops: the first one brought together local politicians and local residents with a goal of carrying out an assessment of the area (around 150 participants in 6 thematic workshops); the second was for technicians to draw up an action plan (around 90 participants in 6 workshops) (Germaine and Lespez, 2014). We then, in a more passive manner, attended meetings of the Technical Committee and Steering Committee of a second socio-economic study commissioned by the District of the Bay of Mont Saint Michel.³ This study, carried out by the consultancy firm 'Maîtres du Rêve' between 2014 and 2016, was aimed at putting the proposed solutions into effect. At the same time we attended the rare meetings organized by the French State. Thirdly, we attended many public meetings proposed by the Friends of the Dam,⁴ the main opponents to the dismantling of the dams. In addition to participant-observation, two types of sources will be used: (1) the institutional records which, on different levels, determine how the valley and/or of environmental issues are assessed; (2) the discourses around these decisions which appeared in the regional daily press (Le Lay and Germaine, 2017) and semi-structured interviews. More than 60 people were interviewed (some of them several times at different times during the process): elected officials, NGO members, river managers and recreational infrastructure managers. In parallel, more than 150 inhabitants, fishermen or other users of the Sélune Valley were met in 2013 and 2014 (Germaine et al., 2016).

RESEARCH AREA

The Sélune River is 100 km long and located in the North West of France. It drains a catchment area of 1,083 km² and has a modest flow rate of 11 m³/s. It is situated in a rural basin with a population density below 60 h/km². Land use is dominated by agriculture which is mainly cattle breeding and factory farming. Since the Second World War, the rise of intensive agriculture has simplified the *bocage*⁵ landscape by enlarging the fields, removing the network of hedges and increasing the areas under crop.

Although the landscape of the Sélune Valley is relatively commonplace, two large hydroelectric dams (Figure 1) built in the 1920s stand out, as most of the waterways in the North West of France only have small weirs and water mills (Barraud and Germaine, 2013; Lespez et al., 2015). These dams were

² i.e., the local branch of the Ministry of Land and Sea (*Direction Départementale du Territoire et de la Mer* (DDTM). *La Manche* is a county (*département*).

³ Syndicat Mixte du Pays de la Baie.

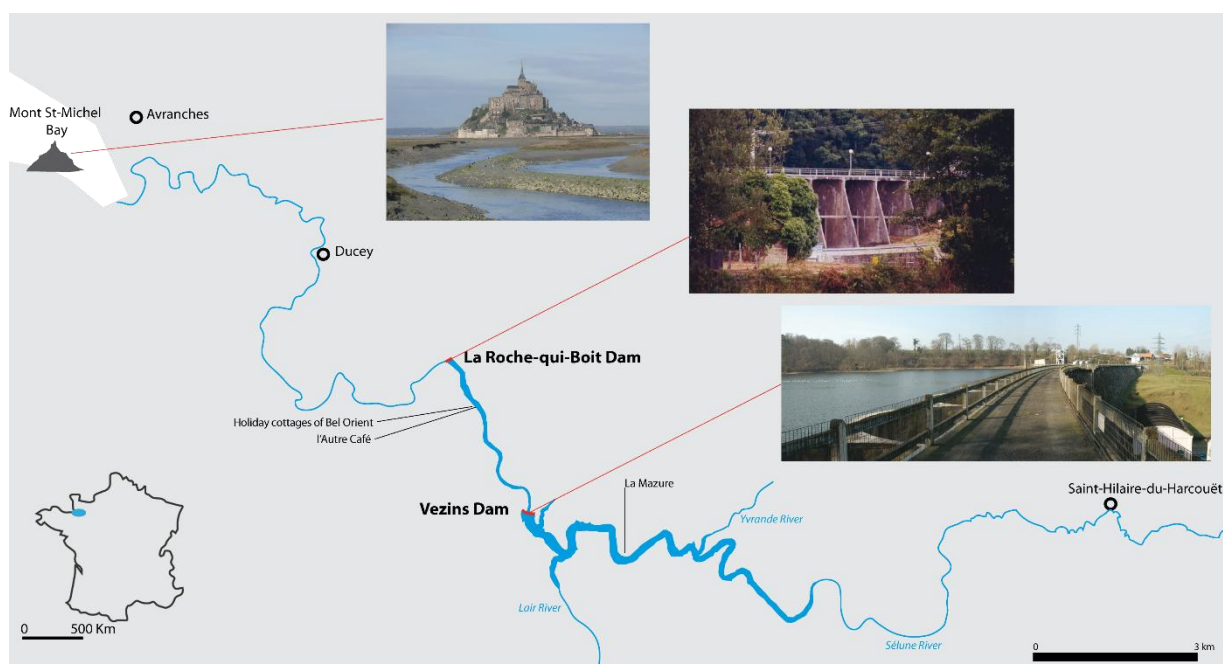
⁴ Les Amis du Barrage.

⁵ Typical French countryside landscape of small fields surrounded by hedges and ditches.

built with new techniques by a famous engineer (A. Caquot) and are famous due to their size. The Vezins Dam, owned by the State, is 36 m high and the Roche-qui-Boit Dam, owned by EDF (Electricité de France), is 16m high. They are run by EDF, the main energy provider in France. The building of the dams involved the flooding of a 20 km stretch of the valley between the towns of Saint-Hilaire-du-Harcouët and Ducey. These reservoirs are used for recreational activities, like freshwater fishing, which spontaneously came into being from the outset.

A further important issue is related to the siting of the two dams which are both situated downstream, a few kilometres from its river mouth in the Mont Saint-Michel Bay, considered to be one of the most beautiful bays in the world and known for its large tidal range (over 10 m). Over 2 million tourists visit the Mount every year. The bay has been UNESCO-listed since 1979 and has received many other awards for preserving its natural heritage, in particular the great variety of birds it hosts.

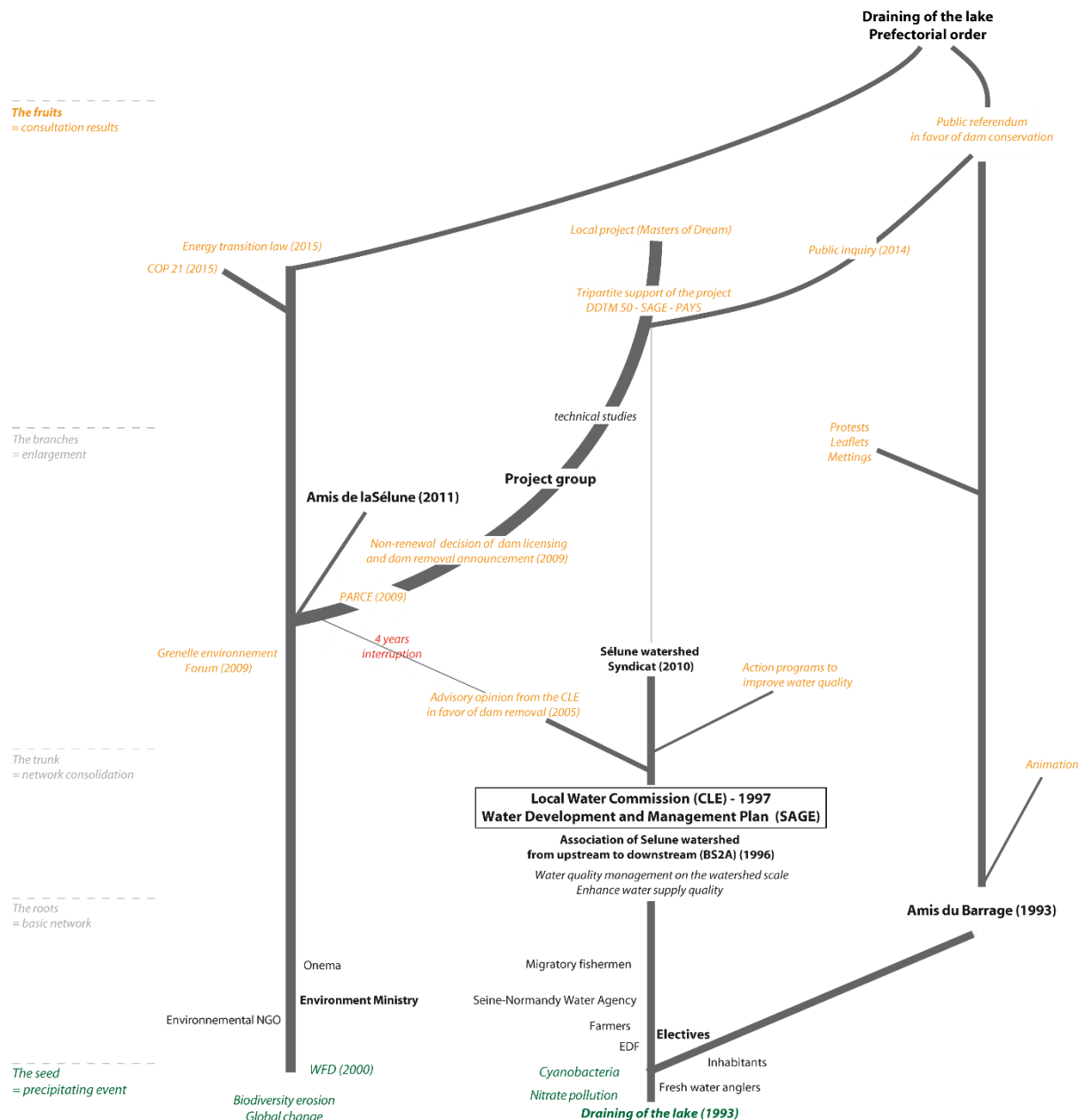
Figure 1. The valley of the Sélune: Two dams near the Mont Saint-Michel Bay.



THE CONSULTATION PROCESS AND THE SETTING UP OF THE CAMPAIGN GROUPS

In order to understand the process of dialogue which was in place between 2009 and 2016, we have to go back in time. The two opposing campaign groups were formed when the two lakes were emptied in April 1993 as part of a statutory 10-yearly security check.

Figure 2. The paths of dialogue around the project to dismantle the dams of the Sélune.



The difficult formation of a campaign group in favour of natural restoration

Environmental crisis and the birth of a campaign group to make the river wilde again

The draining of the Vezins Lake in 1993 was explicitly identified as the 'seed' of a path of dialogue which began between the Mayors of two towns, i.e. Saint James, upstream from the lakes, and Ducey, downstream (Figure 2). The draining procedure went badly. The large amounts of sediment accumulated formed a plug. An exceptional flood in June released a large mass of sludge (200,000 t) downstream with peaks of concentration reaching 130 g/l (Suzanne, 1993). It caused part of the sediment to be deposited in the channel, the floodplain and in the bay, wiping out whole populations of fish downstream. Shellfish harvest-related activities were also threatened. Residents, anglers and local

politicians denounced a 'dead river'. The local politicians started questioning existing management practices. It also led to greater awareness of wider dysfunctions, such as increasing occurrences of cyanobacteria in the lakes which restricted their usage (swimming forbidden along with other aquatic activities) and made the water unfit to drink.

In 1996, this led to the creation of the Association of the Sélune Basin (BS2A⁶), which commissioned studies. These studies revealed a variety of causes for the pollution in the sediments, the river and the lakes: intensive agriculture and sediments from previous polluting industrial activity.⁷ Other actors joined the group which was able to extend its concerns and its reach. The 'trunk' of this path became stronger when a new legislative instrument was created in 1992, the Water Planning and Management Scheme (SAGE⁸), which would become the flagship tool of French integrated water management in catchment areas. The SAGE became operational in 1997 and was one of the first in France. It is administered by the Local Commission for Water (CLE). The CLE was the new stage when dialogue really made progress as the farmers, fishermen, shellfish farmers and conservationist groups could work together with the local politicians and the state representatives to define a plan of action to improve water quality. Amongst the state representatives, the Seine-Normandy Water Agency (AESN⁹) and the National Office for Water and the Aquatic Environment (ONEMA¹⁰) were the most ambitious actors in terms of preserving aquatic environments. AESN is one of the 6 financial agencies that also set out the basic guidelines for water management in the large watersheds (Morandi et al., 2016). Given the problems that arose during the draining of 1993, the CLE quickly raised the question of the dams' future. Both the CLE and the State pondered the possibility of renewing the license which was due to run out in 2007. It was left to the CLE to give its opinion on the matter to the Prefect.¹¹ In 2005, the CLE came out in favour of dismantling the dams but the legitimacy of the vote and the preceding debates was considered unclear given the complexity of the procedure and the large number of absentees (Germaine and Lespez, 2014). The proposal was accepted by the Prefect in November 2005 but as the State did not take any decision on the renewal of EDF's hydroelectric concession, the latter was automatically extended.

National events and renewal of the campaign group

Another environmental crisis led to the creation of another dialogue space which, in turn, strengthened the initial campaign group. At the end of 2007, the French government organized a series of meetings, called the 'Grenelle de l'Environnement' (Baechler, 2009), to take long term decisions on the environment. This is not the place to discuss the content of these complex meetings but simply to point out that debates were focused on the restoration of biodiversity, as illustrated by the subsequent creation of the 'Trames vertes et bleues' which aim to restore the land and aquatic ecological continuity (Cormier et al., 2013). It was also at this time that the environmental NGOs appeared on the scene. The specialists in migrating fish (Salmon Club) and the County fishing federations who had a vital role to play as partners of the authorities (Gramaglia, 2008) enrolled the support of bigger environmental actors. Some of them took part in campaigns to dismantle dams and became involved in the Sélune River campaign. National environmental groups (*SOS Loire Vivante*, *France Nature Environnement*, *Ligue Protectrice des Oiseaux*) but also European (European River Network, Sustainable Eel Group) and

⁶ Association du Bassin de la Sélune de l'Amont à l'Aval.

⁷ One such activity specialised in the treatment of metal surfaces caused heavy pollution in a tributary of the Sélune River (*l'Yvrande*) which flowed into the Vezins Lake.

⁸ Schéma d'Aménagement et de Gestion des Eaux.

⁹ Agence de l'Eau Seine-Normandie.

¹⁰ Office National de l'Eau et des Milieux Aquatiques.

¹¹ The Prefect (*Préfet*) is the French State's representative in a *département* (i.e. county) or a region.

international ones (North Atlantic Salmon Foundation – NASF (NASF, 2009); World Wide Fund – WWF) came together to support the campaign to remove the Sélune River dams. In 2011, they formed a group called The Friends of the Sélune River. Its spokespersons are celebrities from outside the Sélune area who have a strong media profile: e.g. I. Autissier (navigator and ecological activist), O. Vigfusson (founder and president of NASF) or A. Passard (reputed chef who cooks with organic produce grown in the Bay). For the Sélune River, the main 'fruit' of the Grenelle de l'Environnement was the announcement by the Secretary of State for Ecology of the non-renewal of the license for the hydroelectric dam of Vezins on 13th November 2009. In 2010, the Convention for Sustainable Hydroelectricity, signed by the government, hydropower producers and environmental NGOs, confirmed the removal of the two dams to make the two-thirds of the upstream river accessible to migratory fish (salmon, eel, blueback herring, trout...).

The difficult remobilization of the local campaign by the government

The removal was piloted by the Prefect of La Manche, local representative of the State, and his services (DDTM). Thus, the State preferred to maintain control over the operation by handing its implementation over to the local politicians who were in favour of the project. However, the DDTM had to produce "a genuine plan of enhancement for the valley" and to aim at "environmental excellence as well as integrating factors of local development". Finally, it proposed a governance arrangement designed to rekindle dialogue. It consisted of a small project group composed of State services, AESN, EDF and three local politicians. A steering committee open to local politicians and State services mainly validated the studies. A local board of information was initially open to the general public but in reality accessible only by invitation. It met five times between July 2009 and January 2017.

In order to guarantee the participation of local politicians and also to respond to fears, more technical studies were carried out concerning the provision of drinking water and the management of sediment and flooding. Bilateral discussions were organized. Thus, discussions were held with the Director of the Mazure Leisure Park, which was seen as the most urgent problem. Nevertheless, the solutions appear to be only partial, with the promise of compensatory payments and subsidies acting as repayment for local politicians' support. Faced with a boycott of the workshops set up by the mayors to create a new territorial project, the State issued an ultimatum by obliging the local authorities¹² to work together in a joint collaboration. This obligation to work together was a turning point towards a second phase during which the local authorities gained new responsibilities. They gained control of a new study designed to draw up the planning procedures for the reconversion of the valley. This study was carried out by the engineering consultancy Maîtres du Rêve, which produced a project costing €20 million including various planning suggestions (pathways, reconversion of buildings, etc). Given the project sponsor had changed, the local politicians took part in the various meetings of the steering committee. Some of them who were opposed to the removal of the dams justified their participation in this project by invoking their political responsibilities: "I have to think ahead to when the dams will have disappeared. If I don't, I'll be accused of being a bad Mayor" (2012). Another Mayor explained (2011):

This is the start of a process that we're going to draw up ourselves...we have to look forward because if we can't identify with this, we won't be able to commercialize it (...) but we haven't got that into our heads yet, we're still strong supporters of maintaining the dams! But if they are going to be emptied, we really have to think about it.

¹² It concerns the *Pays de la Baie du Mont Saint-Michel* and the Joint Association of the Basin of the Sélune River - the *Syndicat Mixte du Bassin de la Sélune* (i.e. a *Syndicat Mixte* is a structure which federates towns close to each other, either between themselves and/or with public institutions).

In fact, the local politicians' support to the project was lukewarm. Moreover, at no point was there a vote enabling them to reveal either their disagreement or their support for the different proposals.

The process reached its peak in 2014. A legal public enquiry was held in the Autumn of 2014 and 4,500 people expressed their opinion. The conclusions were made public in November: 53% of votes (most of them sent by email) were in favour, which led the Commission to give its green light to the project (Néron et al., 2014). This was the final legal step before dismantling the dams.

The opposition to the removal of dams and lakes

Friends of the Dam

When the lakes were emptied in 1993, another group, totally opposed to the demolition of the dams, was formed. Initially, the *Friends of the Dam* association was formed to propose cultural and festive activities around the lake area. It brought together people involved in recreational activities such as freshwater fishing, the owners of fishing sheds around the lakes or residents. But when the CLE came out in favour of demolishing the dams, it transformed itself into a defence group to save the dams. A first demonstration was held in July 2004 when a hundred or so anglers protested against the removal of the dams. This alternative opposition group grew until the government announcement of 2009. It was at this point that various events were organised to attract new allies, such as the actors in the local tourist industry (e.g. Mazure Leisure Park or the Ange Michel Amusement Park). Posters and banners appeared around the lakes, leaflets were regularly distributed and a blog was set up in early 2010 to keep the population informed (Figure 3). This opposition group was particularly active in holding public meetings (AGMs, informational meetings) in which people could have their say. Local politicians would sit on the stage next to the president of the group. The opposition group became the spokesperson for the lakes and dams in the local community. The presence at their meetings of some local politicians who also attended the steering committee meetings of the local authority was strongly criticized by the most fervent opponents. Soon, these politicians were forced to leave the opposition campaign. The two sides took on more radical positions and people were forced to choose. By way of contesting the result of the official public enquiry, the Friends of the Dam organized a local referendum a year later, in the Autumn of 2015. Ballot boxes and voting slips were deposited in many local shops and voting booths were set up at local fairs. The group declared that 19,276 people had voted with 98.89% of votes against the demolition of the dams. The referendum had no judicial significance but with that kind of result, the group felt it had the right to speak for the people.

Figure 3. Images used by opponents and proponents of dam removal.



Extending the campaign nationwide

The group's success was attributable to networking that went beyond the local community up to a national decision-making level. One political figure stood out, a local MP who had been sitting on the opposition benches in parliament since 2012. He was the most committed local politician, having repeatedly refused to consider an alternative to maintaining the dams. On several occasions he made his opposition clear in the National Parliament.¹³ His efforts bore fruit when he was allowed a meeting with Ségolène Royal, Minister of the Environment, despite her being a political opponent. In December 2014, the Minister made a field visit to discuss the dismantling project. This meeting provided the opponents with an opportunity to have a regional and national hearing. Indeed, the promotion of renewable energy gave them new opportunities. The Minister's Law on Energy Transition and the preparation of the United Nations climate change conference (COP 21, 2015) made up the third dialogue phase (Figure 2). The local conflict became, once again, part of a much wider environmental question.

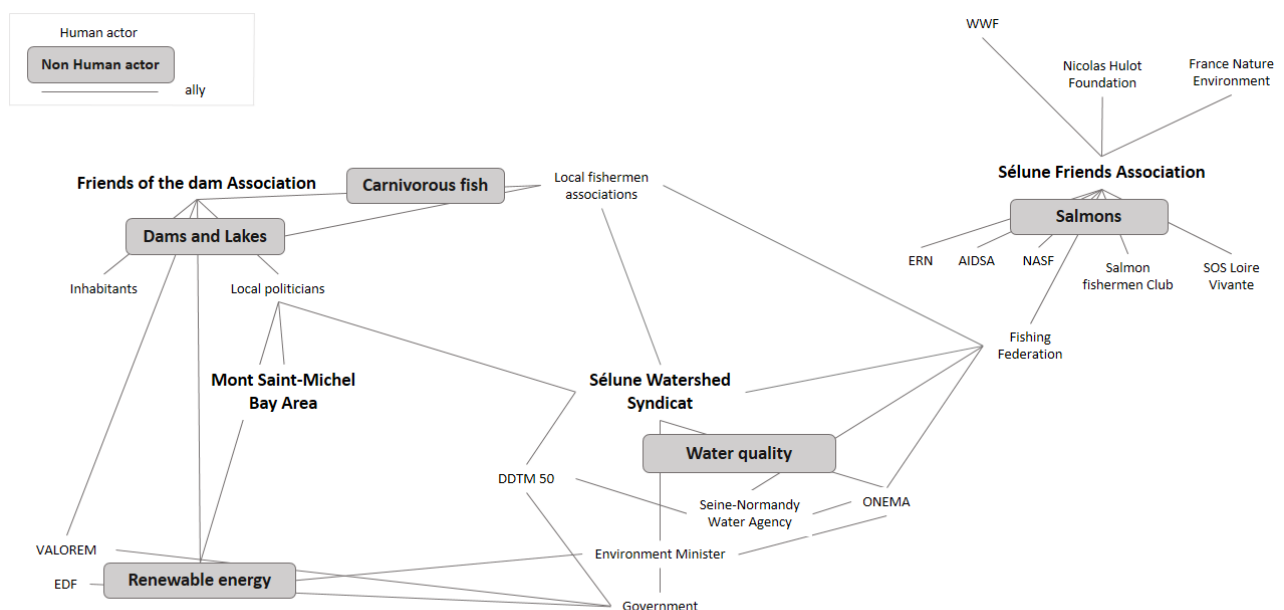
¹³ Questions n°87 published 15/01/2013; n°834 published 20/01/2015; n°1533 published 6/12/2016; n°102053 published 24/01/2017

In the context of several political controversies concerning ecological issues, like the conflict surrounding the construction of the Notre-Dame-des-Landes airport (Barbe, 2016) and the violence that took place during the construction of the Sivens Dam (Souhay and Laimé, 2015), the Minister commissioned additional expertise, considering that alternative solutions should be explored. So, "expert opinion on the potential for hydroelectric production" of these dams was called for along with solutions for upstream and downstream passage of migratory fish. This decision was seen as a climb-down by promoters of the removal project. At the same time, discussions between the MP, the Ministry and the Valorem Company¹⁴ allowed, in mid-2015, Friends of the Dam to put forward the name of a candidate who would take over the dam sites. At the end of this stage, there were two competing projects, hydroelectric production on the one side and the restoration of biodiversity on the other, each reflecting recent political orientations.

Following the favourable opinion of the public enquiry, the project followed its course of validation through the various institutional levels ending with the authorization to begin the works. However, the decree which appeared on 3 March 2016 did not stipulate the dismantling of the dams. It simply specified the draining and sediment management of the Vezins dam. This appeared to be a quiet downgrading of the original project into one involving drainage and a security inspection, a legal obligation which had not been respected since 1993. Actors favourable to the dismantling rose up against this U-turn. But no action has been taken since to suggest that the removal will go ahead. The draining and sediment management works will go on until the Autumn of 2018, when the total drainage of the lake will enable a safety check to take place, following which conclusions can be drawn as to the possibility of maintaining or removing the dam.

THE ROLE OF NON-HUMANS IN THE CAMPAIGN GROUPS (FIG. 4).

Figure 4. The actor network dam removal of Sélune River.



¹⁴ The latter seeing itself as a pioneer in renewable energy in France.

The ambivalence of the dams and lakes

The dams and lakes constitute crucial artefacts in the debate. Their presence had a material dimension which affected the actors of the campaign groups involved. They were reinterpreted in order to be used and then played a fundamental role in the construction of the groups and the process of translation which gave rise to discourse and spokespersons.

The dams have an annual energy production of 27 GWh, the equivalent of the annual consumption of a town of 15,000 inhabitants. This energy is renewable and was indeed labelled 'green' or 'clean' by the defenders of the dams. They also pointed out that the 'Grenelle de l'environnement' had put forward the ambitious target of 23% of renewable energy in France, an objective reinforced by the Law on Energy Transition of 2015. The promoters of removal, on the other hand, maintained that these structures provided a limited quantity of energy (0.04% of national hydroelectric production and 0.1% of the production of the Flamanville nuclear power station situated in the same county) at an environmental cost estimated to be exorbitant. The dams have also allowed recreational activities to develop. This potential has been exploited by inhabitants and visitors who fish the lake as well as by a popular holiday resort consisting of several lakeside huts (Germaine et al., 2016). This landscape is also promoted by the local communities which have put together a rural tourism package revolving around a water sports centre (20,000 overnight stays per year), a village of 19 cottages (1,850 overnight stays per year) and a few private establishments (restaurants, cafés, leisure park) overlooking the reservoirs. The dam and the lake can be seen on the logo of the Friends of the Dam next to a boat and a fish symbolizing canoeing and angling.

In the dam removal controversy, size is a decisive factor. These large structures were built with materials such as concrete, which is a symbol of mankind's increasing domination of nature. By their type of architecture and massive size, large dams are visible evidence of the artificialisation of rivers. Dismantling campaigns use images such as the ones in the WWF Spain's film in which the dam is transformed into a guillotine (WWF Spain, 2009) or in the film *Dam Nation* in which a pair of scissors symbolizes the removal of the Matilija dam (CA). The largest dams attract the most attention because they 'defile the landscape'. For some activists, they deserve to be blown up, as can be seen in videos such as the one showing the destruction of the Elwah River dam. This solution was seen as liberating the river and returning it to its natural state. The size of the project as well as its unprecedented nature on a European scale helped to enrol NGOs of different levels. Size is also the reason for many studies by experts and scientists before and during the dismantling project. In the same region, no removal project of weirs or dams of a couple of meters high was scrutinized in the same way. This also helped make those in favour of demolition aware of the international responsibility involved in the project. The size and strength of the campaign for removal and the links forged between the experts, the government agencies and the scientists owed much to the size and unprecedented character of the envisaged dismantling. The other side of the coin was that the size of the operation was reflected in the cost, estimated at €38 million plus €15 million to redevelop the site. This cost was by far the highest for a river restoration project in the Seine-Normandy basin and this itself became a major argument to put an end to the removal project. Many inhabitants were worried by the experimental nature of the operation, despite being assured that it would be exemplary. Some of them claimed: "we are the lab rats of Europe" (politician, 2010). They feared unexpected problems in the aftermath of this experiment and rejected the idea that their local area should be given up to experts playing God.

The public debate around ecological issues forced the campaign groups to go beyond the traditional defence of the dams in terms of energy production and support for the local economy and to strengthen their environmental arguments. For the promoters of dismantling, dam removal would improve both the quality of the wetland and its biodiversity. Moreover, the Mont Saint-Michel Bay is on the Friends of the Dam logo and in their campaign literature (Figure 3), stressing the importance of The Mount itself, as indicated in the first sentence of their brochure: "The Sélune valley: an exceptional

geographical location! Like its neighbouring rivers, the Sée and the Couesnon, the Sélune flows into the bay of Mont-Saint-Michel, inscribed on the UNESCO World Heritage List". Fundamentally, the Bay is seen in terms of its environmental quality and this quality and interest is reflected in the millions of euros which have been spent on restoring the maritime character of the Mount (Lefeuvre and Bouchard, 2002). In this respect, environmentally speaking, exemplary management is imperative. Quite the contrary, say the Friends of the Dam, for whom the environmental argument is best preserved by maintaining the dams. They claim that the dams act as filters retaining sediment and polluted matter emanating particularly from agricultural practices upstream and, in this way, they prevent the siltation and water degradation of the Bay. At several stages during the process, the refrain "our dams do not pollute" could be heard. This viewpoint is also based on daily tests and empirical knowledge. In the meetings, Friends of the Dam members argued that the colour of the water from the Sélune River at the mouth of the Mont Saint-Michel Bay was clearer than that of its neighbouring river, the Sée. In their eyes, this was proof of the beneficial role of the dams (public meetings, 2012 and 2014). The position of the campaigners against dam removal is rooted at the time of the CLE vote in 2005. Indeed, some defended that it was vital to increase efforts to reduce the level of pollutants before considering dam demolition. The question of flooding was another way of considering the role of the dams. The studies carried out by government officials showed that the dams slowed down the flood wave but had little effect on the extent of the floods. But the opponents to removal believed the dams held back the floods and their demolition would increase the security risk for property, inhabitants and communities downstream. The Friends of the Dam put forward other arguments, such as the fresh water supply provided by the reservoirs particularly in the context of climate change.

Salmon: An emblem of biodiversity or a symbol of ecological interference?

Salmon have crystallised the debate to a large extent. Since the State decision in 2009, the most publicized aim of the operation has been the Atlantic salmon run. The intention was to facilitate the salmon run by creating new spawning areas. At present, 1,585 salmon have been counted in the rivers of the Mont Saint-Michel Bay, 325 of which make their way through the downstream part of the Sélune River. Two types of salmon fishing are practiced. From March to June, spring salmon come back to the river and reproduce having spent two years at sea (over 70 cm). From July to September the grilse come back to fresh water having spent a year at sea (less than 70 cm). In the Sée and Sélune rivers, catches are limited to preserve the species. In 2016, the total allowed catch (TAC) was 105 spring salmon and 478 grilse. During the 20th century, the Atlantic salmon disappeared from most of the rivers of France. The Loire-Allier basin now only has a few hundred specimens and most of the salmon (c.18,000) are found in the rivers of SW of France and in the Breton and Normandy rivers. This explains why salmon has a very positive image. For example, it is one of the emblems of the town of Ducey, situated downstream from the dams, which used to welcome many salmon anglers. With 5,000 salmon expected,¹⁵ the Sélune River will become one of the rivers with the most salmon in the country. The anglers and the Water Agency have become the spokespersons for the salmon, which occupies a prime place in much of the campaign literature of the pro-removal camp (Figure 4). Furthermore, the AESN made a film extolling the benefits of this project. The first screening was to the representatives of the North Atlantic Salmon Conservation Organisation (NASCO), assembled in the Mont Saint-Michel Bay in 2014. So, salmon transformed the dismantling operation into one of the international hot spots of ecological restoration. It is also worth noting that the person in charge of the monitoring programme of the operation is also an eminent French salmon specialist.

¹⁵ Figures vary. The president of the AESN claimed there were 5,000 in the video of 2014 whereas the figure of 2,500-3,000/year is also cited in many meetings. ONEMA studies realised in 2014 claimed that dam removal could potentially add a total of only 1,625 more salmon.

However, by over-publicizing the salmon and by making it the symbol of biodiversity and ecological restoration, the pro-removal camp added to the controversy. One politician, for example, expressed his fear: "the salmon is the cause of the dam removal so if you want to make the salmon in some way exclusive, we are going to disagree. We need to share the river" (June 2010). Apart from the Association situated downstream from the dams, the local angling clubs did not agree. They bemoaned the fact that the angling federations only spoke up for the salmon and not for all the fish stocks. They were critical of a project they saw as discriminatory, preferring a minority over the majority of anglers who were going to see their 'paradise' disappear. The type of angling that was defended was seen as elitist by the local residents. The cost of the operation was all the more difficult to accept if it was only going to benefit one species. Even the Minister declared in 2014 that: "There has to be value for money here. We're not going to invest €53 million so that the fish can get through". At the same time, the opponents to dam removal put into question the expected gain. Some claimed there was no historical trace of salmon reaching upstream from the dams and the presence of spawning areas was also seen as speculation: "All this for a hypothetical salmon run, for the royal fish, the 'salmon'" (press release from the Saint-Hilaire-du-Harcouët fishing club, March 2010). Finally, the opponents to dam removal rejected the salmon because it was seen as an emblem used by the people from outside: "I challenged the Friends of the Sélune to organise a meeting in my village on the condition that it was for locals, and not Americans or Canadians, people who fly over our lakes in helicopters and tell us we must dismantle our dams" (politician, February 2012). For the opponents to dam removal, the salmon had become a symbol of ecological intrusion. This was even more striking given that the lake's biodiversity was forgotten about. The fish caught in the lakes belonged to the white fish category (carp, roach, bream) and predatory fish (perch, pike, pike-perch and even catfish) adapted to deep and calm waters. The lake lovers saw themselves as spokespersons for ordinary biodiversity. But government agencies were not interested in these common species. So, the debate became somewhat metaphoric and given the way in which the fish were utilized and put forward by the campaign groups, one can imagine how the local residents felt about the way they were being judged.

SPATIO-TEMPORAL ELASTICITY

The precise analysis of the setting up of the networks reveals the different values attributed to inherited landscapes and the role of interruptions and uncertainties during the dialogue process. Thus, it highlights the role of time and timescales in the conflict.

Legacy and references

The campaign groups didn't use the same time scales. The defenders of the dam presented a vision of an unchanging landscape which no longer reflected the one they were used to and in which memories weighed heavily. When speaking in public, almost every local politician began by demonstrating their attachment to the area and sharing memories, including the first president of the CLE who was one of the rare supporters of the dam removal: "I spent my childhood in a small house between the two bridges, I am a child of the Sélune" (2009). It was as much about proving one's legitimacy to take part in the debate as demonstrating attachment to the valley's history. The Friends of the Dam were locked into a vision of the lakes which was rooted in its original transformation into a popular tourist resort. The favourite objects of the landscape were the lakes but also a few special places that had hosted intense social relations. The anti-dam removal camp had a static vision of the ecosystem, beyond their wish to preserve the landscape and its activities. The dams were seen as a guarantee of stability which enabled functions such as the control of floods, of pollution and sediment and the conservation of the aquatic ecosystems popular with the residents. It was therefore seen as legitimate and reassuring to maintain them.

The Friends of the Sélune River on the other hand rejected the past and the present. They saw the demolition of the dams as a form of liberation and did not empathise with the local residents who were attached to the lakes. For the Friends of the Sélune River, removing the dams would solve all problems by re-establishing the natural functions of the river such as self-purification, free river flow, sediment movement and ecological continuity. In this respect they were siding with dynamic processes but also, more symbolically, with running water rather than motionless water. The divergence in opinion reflected a wider opposition between stagnant water and running water which is visible in many other conflicts over dam and weir removals (Germaine and Barraud, 2013). The supporters of ecological restoration were part of a train of thought which considered that dams were a symbol of artificialisation (Barraud and Germaine, 2013) as demonstrated by an article in the AESN magazine (March 2014, n°54): "The Sélune without its dams, a good example of the struggle against the pressures of hydroelectricity, the Sélune 'liberated'". The works to re-establish the maritime character of the Mont Saint-Michel and the removal of the dams would repair the errors of the past. It would "return it to its wild state and turn it back into a natural gateway to the bay of Mont Saint-Michel" (Amis de la Sélune, 2012, p. 5 and 616). Their discourse did make reference to the past as, between the lines, it harked back to a state before the advent of anthropogenic development. The AESN put it in the following way: "it is an exceptional project to reconstitute the natural environment" (COPIL MDR, June 2014). So the promoters of the dam removal wanted to build a future that made a clean sweep of the past. The engineering consultancies had to convince them of the value of the dams in terms of built heritage before they would accept that a part of the structure and associated buildings be conserved in the restoration project.

Interruptions, uncertainties and dialogue

The project's path of dialogue was long, complex and didn't follow a linear trajectory. Moments of uncertainty and interruptions played a crucial role. Neglecting the project for 4 years between the CLE's decision to remove the dams in 2004 and the government announcement in 2009 was particularly detrimental. During these 4 years of inaction, the CLE lost much of its legitimacy. Despite having reaffirmed its "wish to programme the end of the dams' activities in the short term" and having considered dam removal as an opportunity to revitalize the valley and to build a wide ranging project, the CLE and the SAGE were abandoned by the State. It didn't even inform them of its forthcoming decision. Furthermore, the dam removal campaign lost much local credibility as the State's late decision was clearly perceived to be part of a national (even international) strategy. Given the silence of the State, any information was relayed by activists who transformed the project into one solely focused on salmon, as stated by the Secretary of State for Ecology explaining the decision in 2009: "It was indeed demonstrated that the dams present an impossible obstacle for the run in and out of the migratory fish and in particular salmon, while the river is classified in this way". On the other hand, this period allowed the pro-dam campaign to strengthen itself and waiting for this 'imminent' government decision forced it to act quickly and more decisively. It structured itself and was in good working order when the announcement came in 2009. The interruption gave an advantage to the opposition and destroyed the first dam removal campaign group which had been difficult to assemble.

The second phase of the consultation from 2009 also has its part of uncertainty and lethargy. Immediately following the decision, further studies got underway to reassure the local politicians. Nevertheless, they were dissatisfied because "studies are being commissioned after the decision, it's outrageous" (February 2012). Progress was slow and despite more reports and several meetings, no real headway was made leading to signs of impatience in the steering committees. Moreover, despite the numerous studies and a battery of powerful regulations, the continued use of the dam was not

¹⁶ Let's adopt the Sélune valley. www.selunelibre.org/wp-content/uploads/sites/35/2014/10/Lets-adopt-the-Selune.pdf

questioned and no decision was made regarding the concession, which expired in 2007. No timetable was set for drainage before dismantling the dam. The slowness of this process and the economic and landscape status quo both reinforced the feeling that the dams' removal might not in fact take place. The politicians underlined the difficulty of dealing with the leisure centre as no information on the level of the lakes in the coming months had been given: "the reconversion project is ready, we submitted it in 2009 but it's not ambitious enough (...) we can't commercialize the holiday season of 2015" (politician, CLI, February 2015). So, between 2009 and 2016, none of the numerous stages of this project made any meaningful headway or gave it any more visibility. It seemed to be an endless process and no-one, including the pro-removal campaigners, could be in any way certain that the dams would one day be dismantled.

For a number of complex reasons, the State and its different departments, which became the spokesperson for the dismantling project after 2009, never managed to fix a timescale for the project. Support for the dismantling project was never given at the right time. The path included 'turning points', which are opportunities to boost the campaign but they were badly exploited. At these key moments, the lack of communication and spokespersons prevented it from moving forward and presenting a real alternative to the present situation, which could have countered the mainstream discourse and attracted further support. So, the failure of the project was not simply due to the lack of a convincing argument but rather to a failure to control the project's agenda and to produce efficient leaders and spokespersons. Even in such a traditionally centralized State as France, a robust legal framework is an important, albeit insufficient, condition for success. By way of comparison, numerous large dams were successfully dismantled in the USA even though American legislation on the matter is more flexible. Having political control, and control of the political agenda in particular, appears to be decisive for any large ecological project to succeed. This was shown to be the case in the Klamath Basin where B. Chaffin et al. (2014) highlighted the importance of timescales in dismantling projects.

DISCUSSION: THE FAILURE OF THE BUILDING OF A COMMON WORLD

The obstacles during the consultation process have been reflected in many studies. It appears that, in projects of this type, the social dimension is often insufficiently taken into account, or indeed ignored (Pahl-Wostl, 2006; Egan et al., 2011; Gosnell and Kelly, 2010; Spink et al., 2010).

In the case of the Sélune River, the local politicians were eager for advice on the landscape reconversion and its associated activities. They commissioned socio-economic studies for precisely that reason. So, in projects of this type, there seem to be problems in incorporating research carried out on the interaction between biophysical and social dimensions (Egan et al., 2011; Hillman, 2009; Spink et al., 2010). Research into local particularities, such as the history of the area and above all the values, local knowledge and the expectations of the community are all too often ignored, even though numerous studies clearly illustrate that these are crucial (Higgs, 2003; Spink et al., 2010). From this point of view and despite the declared ambitions, this project could hardly be seen as exemplary. For the Sélune dam, the references to the industrial past are not significant in comparison with other examples, such as north-eastern US (Fox et al., 2016; Magilligan et al., 2017) and even north-western France (Germaine and Barraud, 2013b). As stated by Gobster et al. (2007), it is, rather, part of a wish to maintain cultural functions, here provided by the river. In fact, the aesthetic and heritage dimensions are both strongly linked to leisure. The Sélune case confirms the analysis made by Jørgensen and Renöfält (2013) which demonstrates that recreational benefits and cultural values play a major role in the protests against dam removal. The affinity with the landscape and the environment of the dams may well be rooted in the past but it also stresses the present-day reality, usages and functions of that these dams (Aberg and Tapsell, 2013; Sherren et al., 2016). A large part of the disagreement was the result of diverging views about the dams' functions.

Moreover, the case of the Sélune River, as with other projects of this size, illustrates the need to look at the question from a political angle. In a New England study on smaller structures, Fox et al. (2016) showed that local resistance was a way of demonstrating firmness to those trying to impose projects from outside. For larger structures, the micro-political question is even more crucial because negotiation can never only be between an owner and a pro-dismantling campaign group. Local residents have an important role to play whilst outside actors are most easily mobilized. It explains why outsiders are often seen as a form of intrusion. In these conditions, the dialogue stage can only function efficiently if it includes stakeholders who directly benefit from the project (e.g. hydroelectricians, farmers, anglers) as well as the wider community, as shown in studies on the Klamath dam in the United States (Gosnell and Kelly, 2010). In the case of the Sélune River, the different groups had great difficulty in reaching the other levels of debate and thereby left the stage free to a caricature of debate between insiders and outsiders. The pro-dam removal campaigners lacked the presence of local political leaders. This is particularly important in France where the approach is clearly a top-down one and where the State therefore needs to motivate local people to support a project.

In a Swedish study of four controversial dam removals, Jørgensen and Renöfalt (2013) demonstrated that the fundamental differences in the opposing groups' representations of nature weighed heavily in the conflictual debate around hydraulic dismantling and helped explain why negotiations between them were so difficult (Eden et al., 2000). As we observed in the Sélune case, the opponents saw the dams as hybrid objects. Like Sherren et al. (2016) observed concerning the Mactaquac Dam (Canada), dams had a material quality in that they were clearly artefacts but at the same time they were seen as possessing a new form of naturalness, that is, a fully-fledged ecosystem created by the dams. They had spontaneously integrated the 'naturalisation of artefacts' (Larrère and Larrère, 1997) whereas in the argument to support dismantling, one could sense an element of purification which attempted to ontologically dissociate the natural from the artificial (Latour, 1991). The supporters of restoration wanted to go back to the state of natural rivers, as in a dreamlike nature in which mankind along with all his artefacts is absent. For one side, the ecosystem would be functional and natural, for the other, artificial and impaired. However, we know today that, over the last millennium and more, the rivers of Western Europe have been transformed by human activity into hybrid objects made up of closely connected biophysical and artificial elements. It is difficult to integrate this statement into the ecological restoration project (Lespez et al., 2013, 2015). The debates between the opposing campaign groups were based on assumptions and at no point did either of them wish to confront their views, which would have been the only way of coming to terms with the complex reality of the situation. Moreover, the different State actors involved did not compel the opposing groups to go through the initial dialogue, so important to the subsequent negotiation, and at no point therefore, were the seeds of discord laid bare. Trying to understand each other's point of view and build a common vocabulary would have avoided stigmatization on either side as well as favouring a common interpretation of a complex reality.

More generally, research into the decision-making process of removal projects stresses the importance of setting up forums which allow local communities and other stakeholders to take on board all aspects of the project (Gosnell and Kelly, 2010; Spink et al., 2010). If there is no shared vision and no discussion, the debate quickly becomes a stand-off, as happened in the case of the Sélune River. It reinforces the importance of local and scientific knowledge in shaping these visions (Bouleau et al., 2009; Linton and Budds, 2014). The Sélune project was probably too technical and too technocratic, as illustrated by the amount of space taken up in the campaign by the Water Agency, the ONEMA and the DDTM. The lively debates between the defenders and opponents of dam removal were often opposing scholarly knowledge to local, empirical knowledge. When the opponents repeatedly refused to accept the minor effect of the dams during flood episodes, the representative from the SAGE stated: "they don't believe in science" to which a local politician replied: "the dams buffer the floods, local inhabitants have seen it happen from close up, no matter what the studies say" (2015). There was also

a semantic side to this; for example, experts and technicians would talk of 'sediment management' in response to fears of local residents knee-deep in 'mud' whilst lakes became 'water bodies' or 'artificial reservoirs' in the discourse of the experts and promoters of dismantling, who preferred, in this way, to stress the artificial nature of the 'lakes'. As with other projects of this kind, the lack of cooperation between the experts, local authorities and interest communities only accentuated the mistrust of local actors (Spink et al., 2010; Gottschalk Druschke and Hychka, 2015). Displaying overconfidence in scientific and technical knowledge will not win a democratic debate and technical arguments are of little consequence up against determined opponents. It is not enough to simply complain about the lack of information or even about people misunderstanding the function of a dam or a hydrosystem (Sarakinis and Johnson, 2003), because in the absence of a shared definition of the problem, any discussion is based on value judgements and ideological principles which are much more difficult to overcome (Gray, 2004). In a debate which can't be restricted to one between expertise and local knowledge, translators are necessary. It is very surprising that for such a big project as the Sélune Dam removal, the results of the French research into technical democracy (eg. Callon et al., 2001) were hardly taken into account. Very little has been done to share laboratory- and field-based knowledge. Thus, it is difficult for the different stakeholders to build a common world (Callon et al., 2001).

CONCLUSION

The study of the Sélune case demonstrates the importance of an in-depth analysis of how stakeholder's networks are set up and evolve in environmental conflicts. It is a way to avoid a too caricatured description of the battle field. Based on field enquiries and participative observation, the method is fruitful because it attempts to reconstruct the whole process of setting up the campaign groups and their trajectory. Combined with the analysis of narratives from the main spokespersons, it reveals the complexity of the networks including pivotal non-human agents and their mobility. The networks mobilize stakeholders sharing the same interests, but their building also implies common representations and values. This is shown by the opposite visions concerning salmon and running/standing water. Moreover, it stresses the importance of the present-day attachment to the lake dams, deeply rooted in the past, which was never well understood by the promoters of the ecological projects. In order for a project of river restoration to succeed, a collective, common sense vision of the river has to emerge. The translation process needs to be improved drastically and that is where the Sélune project has failed so far. This approach also reveals that time has established itself as one of the fundamental variables explaining the failure or success of this type of negotiation procedure. It substantiates the claim that the existence of a legal framework is not enough and demonstrates the effect of interruption and uncertainties and the necessity for the promoters to create a political agenda. Even if the Sélune dams are removed in the near future,¹⁷ an environmental project integrating the local population remains to be drawn up.

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¹⁷ Today (08/17/2017), three reasons can change the destiny of the dam: safety inspection, financial issues (over costs and no candidate for the relicensing) or maybe the integration of the lower river area within the perimeter of the UNESCO management plan of the Bay of Mont Saint-Michel

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