Pre-Competition: A Theoretical and Empirical Condition for Applying RBV to Natural Resources

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Abstract

The Resource-Based View (RBV) of the firm provides an explanation of how companies main gain competitive advantage on a market. When considering the use of depletive natural resources, RBV falls short in explaining how companies may both gain a maximum value from the resources and gain a sustainable competitive advantage through long term use of the resource. Confronted to a time horizon issue between short term rent appropriation and maximization and long-term availability of the resource, companies must develop strategies that enable them to secure a sustainable use of the resource. Our paper sheds light on a specific strategy that companies implement to address this issue. We called this strategy 'pre-competition' and theorize that it builds on a triple articulation of drawing on specific characteristics of the resource, stewardship, and articulating time horizons. In that way, we consolidate the robustness of RBV through specifying under which condition it may be applied to natural resources.

Keywords: RBV, natural resource, appropriation, time horizon

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INTRODUCTION

Resource based view of the firm (Wernerfelt, 1984, Barney, 1991) propose a whole logic that enables to understand how competitive advantage can be derived from the ownership and control of specific resources that are rare, valuable, non-inimitable and non-substitutable (Barney, 1991). This approach has been for long one of the most influential in the strategic management field (Kraaijenbrink et al., 2010). The RBV's core mechanism is Ricardian, as it builds on the heterogeneity and immobility of assets that generate competitive capability-producing and rent-earning resources (Barney, 1991). RBV has explored the role of various resources, and recognizes various types of resources – for example, physical capital, human capital, and organizational capital (Barney, 1991). Natural resources have been lately considered in RBV. A first attempt by Hart (1995) appears very limited in its theoretical implication and more recent research (e.g. Jakob, et al., 2014; Casarin, et al., 2019) replicate RBV approach to natural resources without challenging the core assumptions of RBV.

Challenging the core assumptions of RBV seems mandatory when taking into consideration natural resources. Companies may build competitive advantage on gaining Ricardian rents linked to natural resources (Hart, 1995; Jakob, et al., 2014; Casarin, et al., 2019). But applying RBV to natural resources create a paradox that in considered as a tragedy of horizon: short term use of natural resources to maximize rent appropriation leads to resources depletion and ultimately to the end of competitive advantage as the resources is no more available. We consider that finding out how to overcome this paradox is crucial to better understand how to generate competitive advantage from natural resources in a sustainable way, ie. not only long term but with respect to natural resources cycles.

As some companies have started implementing strategies that aim at managing in a sustainable way the depletive natural resources they draw on to develop a competitive advantage, we led an inductive case study to better understand how these companies could articulate profit making though appropriating rent based on depletive natural resources and sustainable management of

the resources. We used data from two revelatory case studies, Evian in France and Aguas Calientes in Mexico to theorize a way companies and their local allies may articulate these two imperatives. This led us to propose the concept of pre-competition, that is a preliminary empirical step that secures a sustainable use of the natural resources prior the rent making logic based on RBV.

Through revealing this specific strategy, our paper informs strategy makers that it is possible to manage depletive sustainable resources in a sustainable way and make profit. We propose a way to enact this strategy as described in the pre-competition concept. Moreover, from a theoretical perspective, our paper proposes a way to rehabilitate RBV in light of the way it can integrate natural resources. As any theory should draw on explicit theoretical conditions, we propose here that the RBV can be operationalized on depletive natural resources if pre-competition is implemented.

1. LITERATURE REVIEW: RBV AND NATURAL RESOURCES APPROPRIATION

1.1. RBV PRESENTED

What could constitute the competitive advantage of the firm has been long debated (Penrose 1959: Peterarf, 1993; Porter, 1985, Barney, Dyer, J. H., & Singh, H., 1998). Despite various critiques the competitive advantage framework remains a core idea in strategic management research. Porter hence states that "competitive advantage grows fundamentally out of the value a firm is able to create for its buyers that exceeds the firm's cost of creating it."

As seen through Porter (1980; 1985) the Industrial Organization theory clearly states that a competitive advantage will come from either cost management or differentiation of products to create rent and that is is mainly dependent on the management of external factors. Without challenging that aspect, the Resource Vased View (RBV) is considering that other ways exist to create competitive advantage in the way companies are assembling resources or capabilities looking "inside the black box". The RBV emphasizes the role of resources and capabilities in forming the base of competitive advantage. Conner (1991) juxtaposed the Resource Based View with the industrial relation economics to demonstrate that the Resource Based View was proposing a "new theory of the firm". RBV draws on the VRIN conditions : A resource has to be valuable, rare, imperfectly imitable and Non-Substitutable do generate a competitive advantage (Barney, 1991).

A resource is something that a firm possesses, which can include physical and financial assets as well as employees' skills and organizational (social) processes and/or control. The resource-based view takes therefore and interesting view when it assumes that competitive advantage can be sustained only if the capabilities creating the advantage are supported by resources that are not easily duplicated by competitors. As Hart (1995) stated "A firm's capabilities result from bundles of resources being brought to bear on particular value-added tasks (e.g., design for manufacturing, just-in-time production)". More recent research have specified that these resources can be internal or external, but mainly focused on intangible resources to be acquired or controlled through partnering in networks or ecosystems (Teece, 1998, Lavie, 2006).

The rent theory is instrumental in the building of the industrial organization theory and focuses on studying how external factor management create the conditions of rent creation. This perspective introduces what is called production factors heterogeneity. Heterogeneity implies that certain factors are superior than others and this superiority can trigger the competitive advantage of the firm that would appropriate such factor for itself. Therefore, appropriating and capturing such factors becomes a key objective of the firm's agenda (Peteraf, 1993).

With this very central role of the resource in the firm's and the importance of its assembly on the formation of a competitive advantage and in the context of natural resource depletion one can see how the RBV is interestingly positioned to provide a framework of analysis in the Anthropocene era.

1.2. Natural Resources

Natural Resources have been largely absent from the classical and neo classical economic growth models as mentioned by Erreygers (2009). George et al (2015) admit that: "management scholars have paid only scant attention to the physical, and natural resources and their idiosyncratic characteristics" (p. 1598). More recently, a call for a new framework that specifically addresses strategy in natural resources industries has been made to address the complexity of such a strategy (Casarin et al., 2020).

A commonly used definition of Natural Resources is the one developed by the United Nation in the Glossary of Environment Statistics 1997 and frequently cited. This definition states that: "Natural resources are natural assets (raw materials) occurring in nature that can be used for economic production or consumption". Howe (1979) talked of "naturally occurring resources and systems that are useful to humans or could be under plausible technological, economic, and social circumstances". In the same vain Rees (1985) defines natural resources as meeting 2

conditions (1) an availability of technique to enable extraction (2) resulting goods and services that have a demand.

A resource is therefore primarily defined the way it can be used. A distinction is very commonly made by scholars (Hosteling 1931, Solow 1997, Erreygers 2009) between renewable and nonrenewable resources. While non-renewable resources are defined as exhaustible natural resources such as mineral resources that cannot be regenerated after exploitation. Rocktstöm (1999), demonstrates in the 9 planetary boundaries, several essential boundaries guaranteeing the sustainability of our living systems have already been exceeded limiting therefore the potential capacity of generating benefits in the future. the functioning of the biosphere and the Earth is being radically disrupted due to human activities, evident in climate change, toxic pollution, and mass species extinction (Wright et al, 2018).

1.3. NATURAL RESOURCES AND RBV EXPLORED

Several scientific papers have applied empirically the Resource Based View to Natural Resources to test its relevance. The empirical test applied to several sectors dependent from Natural Resources ranging from horticulture with Galdeno-Gomez (2007) to Forest industry in Scandinavia with Lahtinan, Haara et al (2008) and sometime has even been used to highlight how ski resorts should develop strategy of adaptation to climate change with Tashman and Riverra (2016)!

Galedeno-Gomez (2007) therefore analyses the relationship between environmental and economic performance within firms of the fresh fruit and vegetables sector in Spain. He demonstrates that the adoption of environmentally friendly practices in the agricultural sector can create "environmental differentiation" and therefore drive profitability and market share. The knowledge and adoption of such practices and how they are implemented is a real capability which corresponds very well to the way resources are "assembled" to paraphrase Penrose. And it is true that adoption of new practices and the technical assistance needed to achieve that are instrumental in the transformation of the agriculture sector in particular.

Lahtinan, Haara et al (2008) using the case of the large and medium-sized sawmills within the Finish forest industry. They therefore developed a methodology of assessment using a multicriteria decision analysis (MDCA) of the RBV framework comparing the relevance of different resources for the success of business operations. Based on the pairwised comparisons "raw materials" systematically came as one of the top 3 critical resources with and underlines importance of the right types of resources (size and dimension) and suitable quality.

Such papers show the relevance and applicability of the Resource Based View of the firm to think and modelize the impact of Natural Resources in the building of competitive advantage. We have also seen how the RBV is providing a framework that interestingly complement the IO theory offering a new Theory of the firm that like Connor (1991) became a "creator of positive" rather than an "avoider of negative" focusing on how the resources are assembled in a creative and productive manner.

1.4. FROM NATURAL RESOURCES IN RBV TO NATURAL RESOURCES BASED VIEW

The main attempt to develop a renewal of the RBV perspective hav been developed by Hart (1995) introducing the Natural Resource Based View (NRBV) of the firm. Hart claims that management theory has largely "*ignored the constraints imposed by the biophysical environment*". This statement remains accurate as indeed historically management theory "*has used a narrow and parochial concept of environment that emphasizes political economic, social and technological aspects*" (Shrivastava & Hart, 1994). Given the importance of the ecological challenges the world is facing, this position has been judged by Hart as inadequate and we share this analysis. Hart analyses that in the future it is inevitable that businesses will be constrained by dependent ecosystems and nature.

NRBV (Hart, 1995) proposes a new framework composed of 3 "interconnected strategies": pollution prevention, product stewardship and sustainable development. Pollution prevention seeks to reduce emission using continuous improvement methods focused on well-defined environmental objectives. This could lead to cost optimization and productivity and for Hart can be well integrated in Total Quality Management processes and focuses on production and operations. Product Stewardship involves that the environmental impact could also be derived from the whole value chain ie. from upstream sourcing to utilization and waste. A full Life Cycle Assessment approach with the objective of minimizing the impact of a product from its design to its usage and disposal is therefore necessary. Several legislations progressively took this element into consideration changing the framework of action of corporations that need to adapt to this new framework. Hart highlights that the most efficient strategy could then become pre-emption of some resources taking BMW as an example when it pre-empted the "take back" policy by controlling the major de-assembling/ dismantling firms. In his demonstration, Hart still think that capture and control of resources is the best way to (a) gain preferred or exclusive access to important of limited resource (b) establishing rules and regulations that are uniquely tailored to the firm's capability. The Sustainable development dimension is somewhat

surprising in the reasoning of Hart as it builds on a possibly idiosyncratic unbalanced between a North that "eat resources" expropriated in the south. It would create a tangible link between material consumption in the North and environmental degradation in the south. To rebalance and build a competitive advantage firms could be encouraged to develop strategies creating a business in south, managing resources locally in a sustainable manner enhancing the social acceptability and reduce the risk of reject by local community or context.

Mc Dougal, Wagner & McBride (2019) further highlight that the NRBV has been an abstract phenomenon, primarily used by academics to explain competitive sustainable operations. Their paper attempts to go beyond this, responding to the need for an explanation of the practical existence of the four Natural-Resource-Based View resources in industry. Assuming a critical realist qualitative approach, in-depth interviews with sustainability experts in UK agri-food were undertaken. Findings demonstrate the existence of pollution prevention, product stewardship, and clean technologies and align with Hart's conceptualization of sustainability as competitive resources. Whilst the fourth resource, the base of the pyramid, cannot be empirically verified, the fifth resource of local philanthropy is uncovered and contributes to the growing body of knowledge surrounding competitive social sustainability. Findings also challenge the hierarchal presentation of the natural-resource-based view to implicate a more cyclical uptake. Thus, in offering the first empirical explanation of the natural-resource-based view, this paper overcomes a theory-practice gap to elucidate the feasibility, orchestration, and value of resources in competitive and sustainable operations. Therefore, the detailed analysis of what could be considered as the most advanced attempt to incorporate the consequence of Natural Resources utilization in the Resource Based View is deceptive when put in perspective with the astute ecological challenge we are facing. Hart in his attempt is not challenging the Ricardian rent appropriation concept and is therefore restricting the impact of managing the natural resource scarcity increase to either cost avoidance, optimization or access to market, which represent a limitative view of options.

Later research has developed an articulation between rent appropriation, and the use of natural resource. For instance, Casarin, et al., (2020) study the specificity of Nature Resource industries via the standardized nature of their products, their emphasis on process-based innovations, the presence of dual physical and financial derivative markets, and the importance of nonmarket forces (government and stakeholders). Such specificities are setting apart those industries vs. other industries and therefore recommend looking at specific rent building mechanisms. However, the article does not cover the link between the exhaustion of Natural Resources and

the Rent Appropriation. In their conclusion the authors write: "*because valuable natural resources are generally not only rare but also subject to depletion, it would be worthwhile to study the comparative effects of government-induced versus voluntary firm-level strategies to regulate excessive exploitation of natural resources, as well as transition mechanisms to more renewable sources*" (p. 34). They do not challenge the in-built assumption and the rent mechanism as a key factor of competitive advantage building. They finally conclude that: "*the lack of research on natural resource industries may lead to the use of inappropriate or, at best, incomplete analytical frameworks, limiting the utility of strategic management classes for students who later pursue careers in natural resource industries* " (p 37.) Additionally, Jakob, et al., (2014) study the potential link between rent appropriation and competitive advantage but in the logic of managing the stock of common goods and state that the logic of growth or degrowth is inadequate to guide welfare policies. Although they are touching the relation between Rent, Appropriation and Natural Resource, they do not really challenge the mechanism of appropriation as a source of rent and potential exhaustion of resource.

Finally, when considering the limits of the planet, time horizon and RBV, we could consider that applying RBV for natural resources will on the short-term increase rent appropriation but on the long term make the rent disappear as no more resource is available to be use for competitive advantage development. In that view, we wonder if RBV is irrelevant for natural resources or if any condition can be raised for this theory to be empirically applied. As we identified cases in which natural resources are managed in a sustainable way, we have chosen to explore what are the empirical condition that enable actors to implement RBV on natural resources. This led us to raise the following question: How do companies use specific strategies to secure natural resource use for rent appropriation in a situation of natural resource depletion?

2. METHODOLOGY

As the core of our study aims at studying the link between natural resource depletion and the impact on the rent appropriation mechanism and in order to focus on resources that are heavily impacted by the current ecological challenge, we have decided to use the nomenclature of Johan Rockström (2009) looking at a key resources highlighted in the model: water. In the modelization of Johan Rockström water is still within the planetary boundary limit meaning that it is still time for us to ensure we put the appropriate strategies in place to achieve a sustainable exploitation of this natural resource.

The availability of freshwater resource both in terms of quality and quantity will be one of the most rapid challenges we will have to overcome. Besides this increasing demand, the resource is already scarce in many parts of the world. Estimates from the world bank indicate that 40% of the world population live in water scarce areas, and approximately ¼ of world's GDP is exposed to this challenge. By 2025, about 1.8 billion people will be living in regions or countries with absolute water scarcity [1]. This challenge is even clearer when we know that only 2.5% of the water available on earth is drinkable but in a large majority trapped in glacier and snowfield. The national geographic goes highlights that only 0,007% if effectively accessible for human being and that despite that the rate of usage increase of this resource is twice the one of the growing population[2]. Yet this resource is very often not managed and priced properly, and its protection very rarely structured efficiently despite its large usage by industries. Against this backdrop we however see and increase awareness on the issue and several attempts to find a new path forward.

4.3. RESEARCH DESIGN

We will use 2 revelatory cases to shed light on how new disruptive approaches tried to address this paradox: the case of the Evian impluvium Management in France and the development of a Water Fund in Aguascalientes in Mexico. Both cases depict voluntary (inter)firm-level strategies to regulate excessive or inappropriate exploitation of natural resources (Casarin et al. 2020).

Evian. Evian is a town located next to the Geneva Lake in the French Alps. The name of the town has been used to brand the source of mineral water used by Danone and has become a

[1] https://www.worldbank.org/en/topic/waterresourcesmanagement#1

[2] https://www.nationalgeographic.com/environment/freshwater/freshwater-crisis/

reference globally becoming one of the top FMCG brands in the world according to BrandZ[3]. In Evian the impluvium upon which the source quality and availability depends is located upstream on the Plateau de Gavot while the bottling unit is located close to the lake. During its course, the source run across several municipalities, agriculture, and peri-urban areas its protection therefore relies on the real multi-stakeholder approach. The Evian source is a key economic contributor for the region employing above 1000 people directly and a lot more indirectly. This economic activity being directly linked to the source availability and reputation in terms of purity it has quickly been of the essence to ensure that the source would be protected from any type of pollution. This is where the complexity aroused. The landscape of the region leads to a very complex challenge as the impluvium regroup 13 municipalities and more than 80 farmers in an area that is facing a very strong real estate pressure due to the attractivity of the region. In this framework the local private and public actors decided to regroup and find a system of incentive for all to benefit from the reallocation of the wealth created by the exploitation of the source to ensure its long-term sustainability. A collective public/private association named APIEME (Association de Protection de l'Impluvium des Eaux Minerales d'Evian) was created in 1992 with the objective to create a redistribution mechanism.

Aguas calientes. Aguascalientes is a municipality located south of Mexico City. The impluvium of Aguascalientes is constrained by an increasing intensification of farming in the upstream part of the impluvium where sugar cane and milk farming have significantly increased the usage of ground water, coupled with the influence of climate change this has led to a significant reduction of the ground water level affecting the farmers, the municipality and Danone who had a water bottling plant in the region. This is why the Nature Conservancy (TNC) approached Danone and Veolia to promote develop a local water fund. As TNC defines it "water funds are organizations that design and enhance financial and governance mechanisms which unite public, private and civil society stakeholders around a common goal to contribute to water security through nature-based solutions and sustainable watershed management". Practically the idea is to locally create an incentive mechanism for the farmers to change their irrigation practices financing pumps and valves but also creating a bonus mechanism for the water saved finance by a local levy on water user downstream and supported by the municipalities. Additionally, to the Nature Conservancy, the Livelihood Fund for Family

[3] https://www.brandz.com/articlenew/evian

Farming (L3F) has been mandated to work with the farmers on the change of agriculture practices.

4.3. DATA COLLECTION

To structure our case study we used various sources of data that provide different points of view on each case. We interviewed various people, and collected documents in order to provide a robust interpretation not only based on interviews, but also on facts and practices that are documented in each project. As one of the authors has been a participant in an organization that was involved in the two cases (but the author was not directly involved in these projects as a core actor), it helps us getting in touch with the relevant actors, and to collect internal document that are meaningful to the actors.

Interviews

We have used interviews from actors that take part in the collective management of the resource, as the two cases illustrate. We have chosen the people in line with their implication in the case, and their knowledge of the history: these people could both tell us about the current situation, but also about the history of each situation.

Table 1: Interviews led in the Evian and Aguas Calientes cases

Evian – 8 Interviews or Video analysis – totals 8h00 of audio/video analysis.
- 2 Danone Corporate Executives - 3 Mayors through analysis of video interview performed by APIEME - founder of APIEME ex. VP Sustainability of Danone - Secretary General of the Ramsar convention - A local Farmer - Danone CEO

Aguas Calientes – 6 interviews – totals close to 5h00 of audio interviews
- Veolia project manager - Veolia project lead - Danone project manager - 2 persons from Livelihoods Funds for Family Farming - The Nature conservancy Water Fund Lead

We have led the interview through a semi-structured way, as considered y Romelaer (2005). This led us to identify 5 main themes (context, natural resources, link between natural resources and competitive advantage, consideration of time, and inter-actors collaboration), and subthemes for each of these themes. Table 2 presents our interview guide in details.

Table 2: Interview guide

Themes	Questions
Context	
The interviewee	Presentation of the interviewee & interviewer Description of the role, function and background of the interviewee Description of the link with the case study and his role in the case
Organization	Presentation of the organization Presentation of the organization role in the case study Description of how the natural resource studied is linked to the organization
The case	Description of the reasons the project studied had to be launched Mapping of the key stakeholders of the project and their roles Detail the reasons for the organization to join the projects
Natural Resources	
Natural resources and cognition of managers	Description of the impact of Natural Resources in the activity of the organization Description of how Natural Resources and their availability are considered in the strategic running of the organization
Scarcity of natural resources	Description of the evolution of the Natural Resource availability Description of the impact on the strategy of the organization Description of how the Natural Resources were part of the decision-making process of the organization before and after the case study
Competencies & Capabilities	Describe whether specific competencies and capabilities are needed to manage the resource Describe any organization or people changes linked to the case study

Natural Resources & Competitive Advantage	
Natural Resources and competitive advantage	Describe where the competitive advantage of their organization lies and the role of natural resources Description of the potential options the organization has to ensure its access to strategic Natural Resources (appropriation, share…) Description of the one chosen by the organization and its reasons Explain if and how the Natural resources contributes to the competitive advantage/disadvantage of the organization and how
Rent appropriation	Analyze the role appropriation has in this context: describe the pro & cons. Analyze how natural resources is considered in a rent appropriation mechanism Analyze whether appropriation and resource preservation compatibility
	Describe what is an efficient management of Natural Resources
Role of Time	
Time horizon of the organization	Describe the time horizon of the decision-making process of the organization Analyze if and how this is compatible with an efficient the management of the Natural resources of the case
Short-term & Long-term tension	On the specific cases detail the potential tensions between the long-term availability of those resources and the short-term need for competitivity? Analyze how their specific organization can react to that
Natural Resources Dynamics	Describe the evolution of Natural Resources availability and how this is affecting the work of the organization Describe whether this requires/has required the creation of new knowledge or competencies
Inter-actors collaboration	
Stakeholders	Describe the evolution of the collaboration between stakeholders alongside the project

	Describe whether a change of behavior / appropriation mechanism/ relationships took place during the case study
Collaboration	Analyze if and how this evolution is impacting the appropriation mechanism Describe if new capabilities have been developed to manage this new form of collaboration

Documents

We also use several longitudinal materials to study how this specific relationship between the resource and the competitive advantage has evolved over time. We used various sources like internal strategic presentations, progress update documents from the various organizations, email exchanges, websites of the institutions, print and tv commercials that reflect the brand narrative over time and the link with some resource characteristics. Table 3 details the documents that were collected in both cases.

Table 3: Documents collected for the Evian and Aguas Calientes cases

	Document					
1	Publicité Evian Respirer à 3000	Danone	jpeg	1961	Commercial	1
2	Publicité Bienvenue dans notre usine	Danone	jpeg	2012	Commercial	1
3	Publicité evian 2012	Danone	jpeg	2012	Picture of print add	1
4	MoU Danone Fund for Water	Danone	pdf	2013	Memorandum of Understanding between Danone and Ramsar on partnership	18
5	Water Final Characterization Document	Mc Kinsey	pdf	2014	Internal strategy presentation on water resource protection	26
6	Le semaine -jounral des salaries	Danone	pdf	2014	Intenal newpaper for employees explaining the project	8
7	Fond Ecosystem Veolia presentation Terrag'eau	Danone	ppt	2016	Presentation of the Terrag'reau apieme project to Veolia	13
8	Key terms for contract preparation	Danone Ecosystem Fund	word	2017	Internal note summurizing objetives and deliverables ofthe partnership	4
9	CP Invitation	Danone	pdf	2017	Press release to annouce the first biogas injection in the local network	1
10	Internal note Ramsar	Eric Souberan	word	2017	Internal note of rational on RAMSAR partnership renewal	2
11	MOM Minutes	Danone	word	2017	Minute of the discussion on the renewal of RAMSAR partnership	2
12	Rethinking Nature Based Solution	Collective	pdf	2017	Call to action to pre competitive actions to protect water	5
13	CSR Evian Brand Initiative	Danone	pdf	2018	Recap of CSR Strategy of the Evian Brand	56
14	Apieme - arboresence of website	Eric Souberan	word	2021	Menu of the Apieme Website higlighting the logic of the com strategy	3
15	TC Commercial	Danone	youtube	2021	New campaign highlihting Natural resource protection	
16	TV Commercial	Danone	youtube	na	Protegeons la vie à sa source	
						141
	Emails					
17	Call avec Ramsar	Danone	pdf	2017	Exchange of 2 Email to debrief on the partnership renegociation	2
18	Yes Yes biogas	Danone	pdf	2017	Exchange on email annoucing the launch of the Biogas plant	3

	Title	Author	Format	Year	Description	Length pages
	Document					
1	Aguas Calientes Water Fund Project	The Nature Conservancy	ppt	2016	Description of the objective and project outcome. Contribution of every partners	13
2	Partnership Structure	The Nature Conservancy	ppt	2016	Partnership strucutre description	6
3	Memorandum of Understanding Water Allies	Danone, Veolia, Livelihood, TNC	pdf	2016	Memorandum of Understanding for Partnership	4
4	Aguascalientes IC proposal	Livelihoods Fund	pdf	2017	Description of the Aguas Calientes case for Livelihood IC decision	81
5	Aguas Calientes - Project Update	Livelihoods Fund	pdf	2017	project update and model description for each partner	40
6	Water Stewardship Benefit Accounting	WRI Valuing Water	word	2017	Paper explaining the benefit of the water stewardship practices used by WA	24
7	Context Setting Water Allies	The Nature Conservancy	ppt	2017	Description of what a water fund is	21
8	Water allies Steering Committee minutes	Danone, Veolia, TNC, Livelihood	word	2017	Update on the project actions and deliverables	4
9	Pre Read	The Nature Conservancy	pdf	2017	Pre read on progress on the project	2
10	WSBAM Postcard	WRI Valuing Water	pdf	2017	Methodology if multibenefit quantification	2
11	WF List of Action	Danone, Veolia, TNC	,xls	2017	List of expected benefit and priority actions	1
12	Pitch Aguas Calientes Co-Funding	The Nature Conservancy	,pdf	2018	Co-funding stratedy, project description, what's in it fo key players	4
13	Water allies Steering Committee minutes	Danone, Veolia, TNC, Livelihood	word	2018	Update on the project actions and deliverables	3
14	LV Fund Call for COP 24	Livelihoods Fund	pdf	2018	call for integrated SDG approach	2
15	Aguas Calientes WF FundRaising	The Nature Conservancy	.xls	2018	List of potential co-funder and descritpion of their interest	1
16	Water allies Steering Committee minutes	Danone, Veolia, TNC, Livelihood	word	2019	Update on the project actions and deliverables	4
						212
	Emails					
17	Draft Water Allies Steering Committee Update Notes and Aguascalientes Pitch Documents	TNC	pdf	2017	Email exchange on the agenda of the alliance SteerCo	2
18	Re: Aguascalientes Workshop on Water and Agriculture	Danone Veolia	pdf	2017	Email exchange between Veolia and Danone on development of the alliance	2
19	RE: Draft Water Allies Steering Committee Update Notes and Aguascalientes Pitch Documents	Livelihoods Fund	pdf	2017	Email exchange from LV to highlight their priorities	3
20	Tr : Notes and Action Items from Water Allies Briefing	Danone	pdf	2017	Internal email on water priorities	5
21	Re: Water allies	Danone Veolia	pdf	2018	Email exchange on the future of the alliance	2
22	RE: Water Allies Steering Committee Meeting Pre-Read	Livelihoods Fund	pdf	2018	Reaction of LV to the water allies pre-read	3
						17

4.3. DATA ANALYSIS

Our data analysis followed a logic of grounded theory (Galser & Strauss, 1967) in order to develop a theory that adhere to the two cases, without specifically drawing on previous theories in order to theorize.

We first integrated all documents in Nvivo 12 in order to have a tool that would enable us to structure of coding process. We then started to code our data inductively, which led us to make 25 codes emerge from the data. These codes appeared as a list of codes that were not hierarchized but that would help us structure our thinking about the cases.

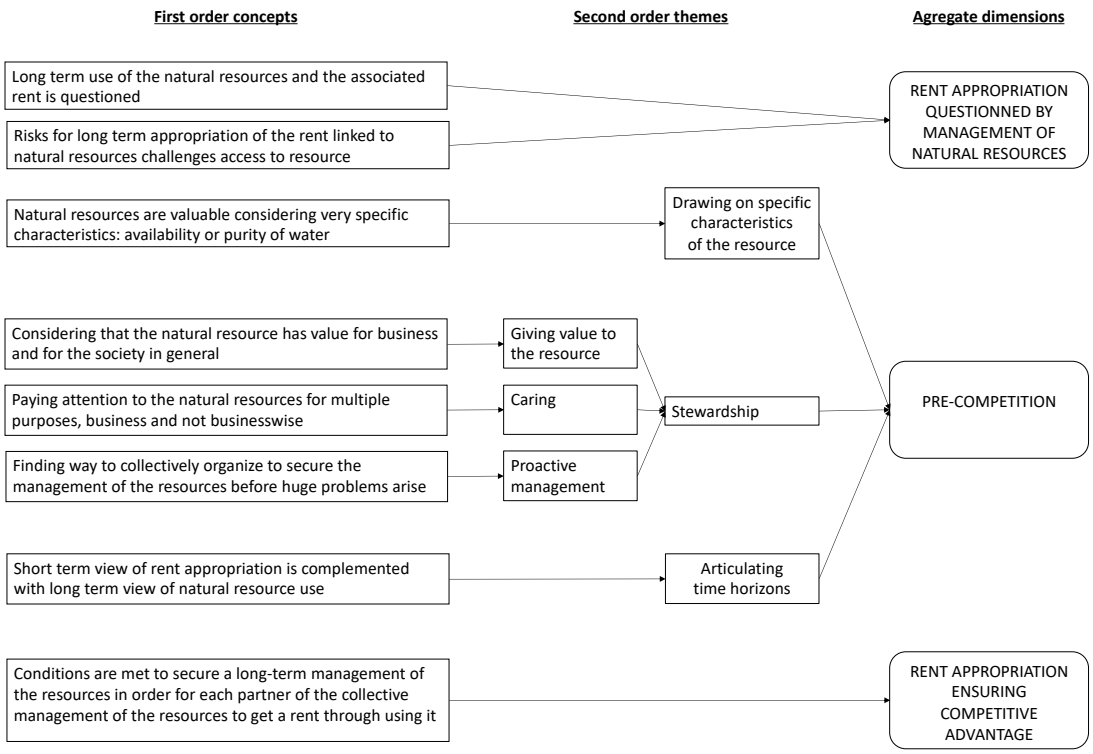
Table 4: Initial codes from inductive coding

	Codes
1	Personal attachment to the ressource
2	Importance of family and local roots
3	Cooperation between stakeholders to protect the resource
4	Conflicting time horizons between business and nature
5	Local political constraints linked to resources utilizations
6	Depletion of Natural Resources and economic impact
7	Manager perception of the Natural Resources
9	Conflicting interest in resource usage and management
10	Solidarity among local players
11	Utility of the resource
12	Role of leaders in the prioritization of resource management
13	Awareness of the Depletion of Natural Ressources
14	Understanding of the Natural Resource cycle
15	Change of perception and behaviors of leaders
16	Natural Ressource management as part of strategy
17	Evolution of the perception over time
18	New competencies / new role emegence to manage the resource
19	Short term interest vs. Long term preservation
20	Description of Natural Resource as a source of competitive advantage
21	Purity of water
22	Availability of water for all
23	Limit to the appropriation of the resource
24	Governance mechanisms to protect the resource
25	Risk and consequences of the depletion

We then organized these themes into meta-categories and then turned to selective coding in order to keep only the core elements. It turned out that we took away the codes that were linked to the cognitive conditions for getting into such strategies, and focused on what the companies do. We created the concept of pre-competition that articulates three dimensions of our analysis: stewardship, articulation of time horizon and focusing on specific characteristics of the

resources. We could analyze that pre-competition is a solution to potential rent appropriation issue and enables rent appropriation, once it is implemented. Our analysis led us to structure our categories into three main dimensions that we present in Figure 1.

Figure 1: Data structure



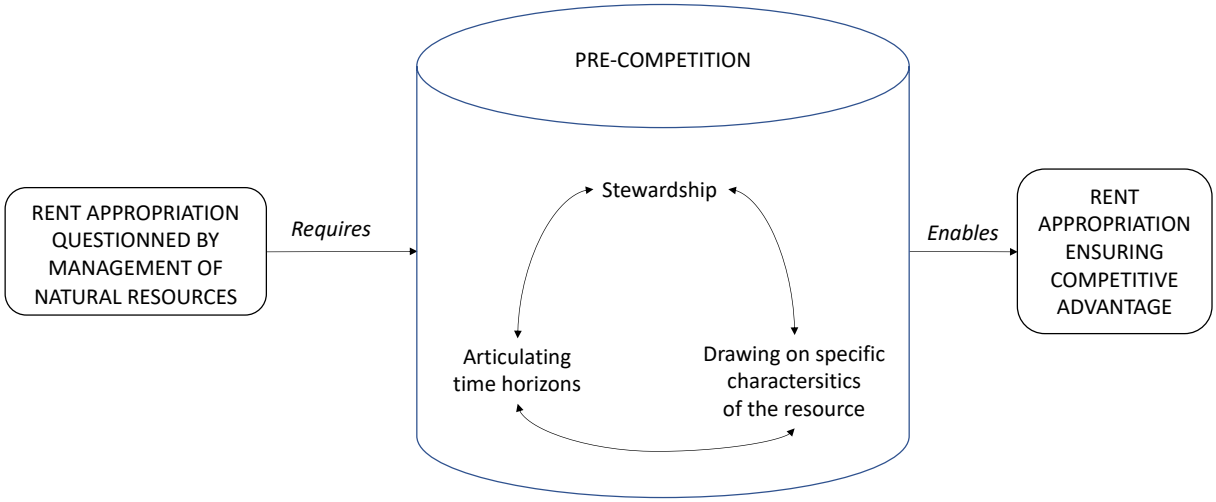
3. FINDINGS: PRECOMPETITION AS A WAY TO MANAGE NATURAL RESOURCES WITH A SUSTAINABLE PERSPECTIVE

Our analysis, as shown in Figure 2, led us to identify how companies can lead a sustainable way to manage natural resources, which we called pre-competition. We used this term for two reason. First, it was mentioned by some of the actors of the field in the Evian case to depict their approach. Moreover, we believe this term could be used as it depicts that this logic precedes the logic of rent appropriation through using natural resources, i.e. once pre-competition is set, traditional RBV strategy is implemented with rent appropriation in order to

get a competitive advantage over the competitors. Pre-competition consists in three articulated mechanisms:

- Drawing on specific characteristics of the natural resource,
- Change in time horizon,
- And stewardship.

Figure 2 : Implementation of a pre-competitive strategy for sustainable use of natural resources



The next paragraphs will explain in detail these elements which together enable companies to develop a sustainable management of natural resources.

4.3. RENT APPROPRIATION ISSUE

Both cases start with identification of potential issues linked to the way companies may use the natural resource in order to appropriate the rent associated with its usage. In Evian, the Danone company not only recognizes that it depends heavily on a natural resource to run its business, but also raises the issue that pollution may damage the quality of the water. Danone VP Operation for Water Division explains exposed in concise terms how Evian operates:

> *"a company that is part of Danone, Evian, that depends on the sales of water, depends on having this water being available, being sustainably available, being of the right quality and here you know the Natural Resource which in my way of speaking is more the ecosystem, the land, the ecosystem would be very critical because this is the source on which the company depends. So, it's a relationship between resource and use." Philippe Galois – VP Operations Danone Water - Interview*

Here, the VP Operations of the Water Division emphasizes the role of the intrinsic link between the Natural Resource, and its usage. But this usage can create an ambivalent situation where if

overused or polluted the resource can deplete and therefore limit the capacity of sustainable rent creation. In that case the appropriation can become deeply counterproductive as a short-term maximization of the resource will exhaust its capacity to replenish. The threat that pollution or overexploitation could create is clearly highlighted in several interviews we conducted.

> *Evian, depends on the sales of water, it depends on having this water being available, being of the right quality and here you know the Natural Resource which in my way of speaking is more the ecosystem, the wild land, the ecosystem would be very critical because this is the source on which the company depends – Martha Rojas Urrego – Secretaty General Ramsar Convention – Interview*

In the case of Aguas Calientes the different stakeholders, farmers, the municipalities and its citizens, Veolia as a municipal water provider and Danone as a water bottler, use the resource for their own consumption and needs. Such usage determines what the resource brings to them. While the resource itself was for long not managed and considered as infinite, its availability gets challenged by the demographic, climate change and agriculture practices, challenging therefore the potential usage attached to it.

> *"In the next few years, Aguascalientes (State and city) will face significant water security challenges. On the one hand, an accelerated depletion of the aquifer levels, which represents 70% of water consumption. In five of the six main aquifers, extraction surpasses recharge by a volume equivalent to filling 175 times the Aztec soccer Stadium every year. On the other hand, water quality in both surface and groundwater sources has decreased sharply. There are at least 130 points of untreated municipal wastewater discharge. These two risks will be heightened due to the effects of climate change, based on which by 2030, a reduction in almost 15% of available water is expected" Pitch Document Water Fund AguasCalienties*

Such rapid evolution leading to tangible issues faced by local players consequently lead the municipality to include that dimension as a condition for the renewal of their concession contract with Veolia.

> *"Veolia was in charge of the city concession and needed to enter into the management of the resource itself to ensure its contract renewal and the resource long term availability" Laurent Auguste - Executive Vice President New Business Models Veolia - Interview.*

Multiple stakeholders however have a role to play in implementing a partnership in which each one takes part in through aiming at specific interest and leveraging risk.

> *"You have to imagine there are going to be winners and losers if you either leave things as they are: growing populations, urban, suburban, very urban, just nonagricultural. Populations will grow with*

less and less resource behind them. And at some point, that power issue will have to break." Andrea Erickson – Director Water Resource TNC - Interview

A key member of the emergent partnership claims: "*there was a real challenge in this partnership as partners did not know how to work together*" – *COO Livelihood –Interview*. Such complex network of potentially diverging was the basis for a potential vicious circle where everyone was only incited to utilize the resource to its own interest and capture the rent associated to it without anticipating the impact of its usage on the long term availability of the water resource therefore undermining its own potential of long term rent appropriation. A collective action to management de resources so that everybody could use it to generate rent of use was necessary. Table 5 provides additional data that were used in order to consider rent appropriation issues.

Table 5: Additional data supporting analysis of "Potential issues in rent appropriation"

	Evian case study	Aguas calientes case study
Potential issues in rent appropriation	"*Our [strategy] was first defensive in a sense that the focus was first to develop systems of detection of potential pollution. In the 70s and 80s atrazine was used in the culture of maize so we needed to tightly monitor the risks*" – Bernard Giraud – President Livelihood – Interview "*There are evident links between the resource availability and what we sell. You need to ensure the daily availability of the resource to sell, this is as simple as that."* Philippe Galois VP Operation Danone Water - Interview The project Terr'a Grau mentioned in its submission to the ecosystem fund the "*importance of developing a fertilization of precision in the impluvium of Evian to limit potential pollutions*" – Ecosystem Fund Project Submission, 2010	" *The issue for Aguas Calientes city was the agriculture practices around the city. Without this pressure from agriculture the aquifer would have been able to balance*" Laurent Auguste Executive Vice President Veolia – Interview "*In Aguas Calientes two trends were clearly cumulative on the one hand a very strong demographic pressure requiring and increase in the drinking water output and on the other hand an intensive farming model based on grain production that requires increasing water usage to ensure a good yield.*" Jehanne Fabre - Water Cycle Manager Danone - Interview

4.3. PRECOMPETITION

Our analysis led us to identify or core strategy in both cases. These strategies consist in developing collective management. In the Evian case, this took the form of an association called APIEME (meaning Association of Protection of the Watershed of Evian mineral water), which can be described as

> *"a unique set up where the structure developed regroup municipalities benefiting from the taxes derived from the resource exploitation, the private company exploiting the resource and the municipalities protecting the resource" Jean Philippe Bened APIEME President 2001-2008 – Media Interview.*

In Aguas Calientes, the same king of collective organization is developed under the name of Water Allies. Our analysis does not focus on the status and type of governance of these entities that run the collective management of the resources, but rather stresses that these strategies propose underlying mechanisms of resource management. We identified that these consists in three articulated mechanisms: drawing on specific characteristics of the resource, stewardship and articulating time horizons

3..1. Drawing on specific characteristics of the resource

Through analyzing interviews and documents we realized that our respondents do not consider the resource as the basic the natural, but rather focus on some specific characteristics of the asset. In both cases, it is not the water or the source, that are considered as the assets. In the case of Evian we established that it is its purity that is at the heart of the rent creation mechanism and justifying therefore a specific strategy for its preservation. For Aguas Calientes it is the required volumetry of the resource and its capacity to be available for all actors involved that is determining the strategies developed by the Water allies.

In the Evian case, several of our interviewees highlighted purity as the true source of competitive advantage for the water brand of Danone. What differenciates Evian from other water is its unique composition, called 'pure', that is recognized by the market and that all actors aim at keeping as pure as possible:

> *"Water has something magic and unique; it is a treasure […] it remains in drinks sector a very unique product it the best for health and especially Evian who has something magic in it linked to the purity, naturality and health" – Annick Moreau – Head of Public Affairs Danone Water – Interview.*

This feature has been used by Danone for decades as one of the main messages. For example, the Evian Brochure for Visitors mentions "*Nature gives our water everything it needs – we don't add things for taste or enhance with extras*". Figure 3 show that commercials from 1930, 1972 and 2015 all use the same 'purity' characteristics as a central marketing element.

Figure 3: Commercials used by Danone to use purity as a key feature of evian water.

1930 1972 2015

In the case of Aqua Calientes, the key characteristics of the resources lies in its availability "*with the right quantity at the right place at the right time*".

> *"Water is used but it is not consumed completely and obviously it can be moved. For me it is a vector. The water resource is essential on a certain number of our activities, of course on life. And the question is its availability in a given geography at a given time and therefore the ability to go and use it to generate all the activities and basically life. So, from this point of view it is THE ingredient, for the food system, for life and for any economic activity. This is why this is a resource, because it is a fuel without which a certain number of activities are not possible" Laurent Auguste – Executive Vice President Veolia - Interview*

This characteristic of resources allocation is a key factor to ensure that all activities (agriculture, industries….) can fully benefit from their competitive position.

Additional data is provided in Table 6 to stress that specific features of the natural resources are considered by the actors.

Table 6: Additional data supporting analysis of "drawing on specific characteristics of the resource"

	Evian case study	Aguas calientes case study
Drawing on specific characteristics of the resource	***Purity is driving the rent building opportunity for evian*** "*Evian gets its exceptional qualities from the purity of its source giving its unique composition*". Danone 2017 Internal Marketing Document. "*The quality of the resource in the case of Evian it is purity in fact*" Philippe Galois – VP Operation Danone Water – Interview "*The image of the Mont Blanc, of the purity of the snow, the brands appropriated it completely […] we now say that we are excellent in the protection of the resource it becomes instrumental in a kind of excellence positioning. This is shared by all [in the community] as this is directly linked to local development and also the tourism. It became a win win*" - Bernard Giraud – Danone & President of Livelihood – Interview	***Availabilty "on time at the right place " is a determining factor for all players to develop their activities*** *"And this is about the resource management. It's about the agricultural use of water or it's a resource to it's a quantity of water and quality of water that is necessary to electric generation. So, it becomes about how much and where and how that we use that. And then there's then this issue of like, well, then how many users do we have and how much do they need and when do they need that?"* Andrea Erickson "*The cost of not collectively taking prioritized action, with a long-term vision and through an integral approach, can be higher both economically –l ost or unrealized investments – socially – the inability to generate and the loss of jobs – and on the environment – irreversible damages on high-value environmental and water ecosystems*" – Extract 2018 Pitch Water Fund Aguas Calientes

3..2. Stewardship

We used the term stewardship to reflect the fact that companies that deal with managing natural resources sustainably for their competitive advantage articulate three elements that together create a stewardship attitude. First, they give value to the resource, not only as a competitive asset, but as a natural resource per se. Second, these companies *care*, which in essence means that they pay a serious attention to something to avoid potential damage or risk. Third, they proactively manage in order to run and control the resource.

In Evian case we have seen how Danone has developed a range of very strategic orientations to protect the purity of the water it is bottling and selling across the world. To do so it had to engage way beyond the company doors with the entire ecosystem. Over 25 years new governance emerged and the role to the company in its territory transformed drastically.

As Annick Moreau stated "*what triggered the movement at the beginning was the awareness that we needed to manage the resource with its permanence over time in mind*" and that "*to*

generate value we could not only extract water and bottle it". To steward the resource the Evian team had to understand it natural cycle and made it understood by local communities. Danone therefore very early invested into detailed hydrogeological expertise to study and materialize the link between urbanization, agriculture practices and the capacity of the actors to protect the resource itself. An investment that in the logic of understanding and protection of the resource was key but in a way was extremely far from the traditional business activity performed by Danone.

> *"We very early developed an hydrogeologist team, supported PhD, sponsored diverse studies to better understand. This was key for our license to operate but also to convince local communities. When I think of it, it is always from Evian that the whole [Danone] business has tried to anticipate emerging risks linked to the water resource. […] Annick Moreau – Head of Public Affairs Danone Water - Interview*

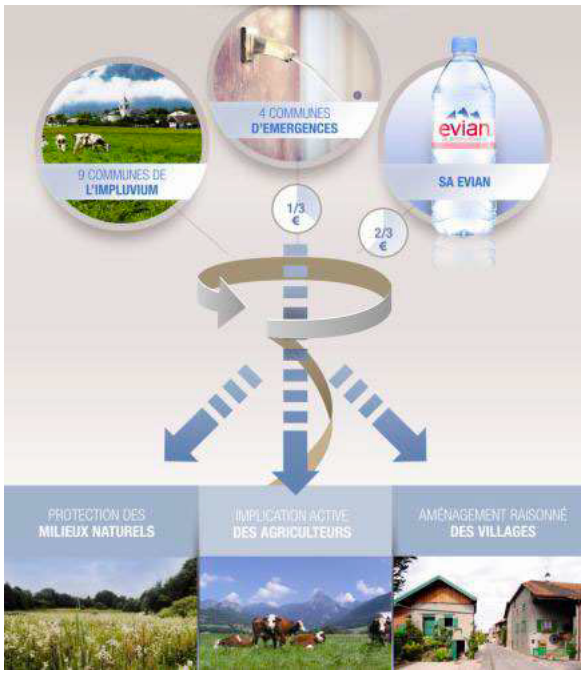
Evian Water Resource is not owned by anyone in particular as it is a collective property and that several actors benefit from it directly or indirectly which creates a collective responsibility to ensure that the resource is available with its specific characteristics, and therefore needs to work and act with other actors in a collective manner:

> *"as people are involved, it's absolutely essential as part of the sustainable management to involve the different stakeholders, […], for example for Evian, in the impluvium which is the RAMSAR site where it was established in the source of the Evian Water there was a work with the municipalities so how could you conserve this resource if you wouldn't work with the municipalities and all the local actors. This is a collective journey!" Marta Rojas Urrego – Secretary General RAMSAR – Interview*

Such collective management and shared responsibility towards the resource implied to develop specific strategy to ensure this stewardship with the municipalities, the farmers living on Evian. It led the Evian team to engage with stakeholders on topics such as the way to manage the deicing of the road in the locality to limit the usage of salt that could infiltrate ground waters or thanks to APIEME subsidize the discontinuation of usage of fuel tank that could create a risk of pollution for local individual houses.

The graph in Figure 4 is taken from an internal Danone presentation. It explains the principles of financing of APIEME. 4 municipalities benefiting from the bottling taxes contributing for 1/3 of the budget, Danone contributing for 2/3 of the budget and 9 municipalities upstream that benefit from 3 types of actions: Protection of the wetlands, Help towards sustainable agriculture practices, and sustainable development of rural villages upstream.

Figure 4. Principles of collective action and funding for territory protection



Water in Mexico is the property of the nation, and its use is granted to different parties through water rights, legal contracts that state the volume of water, source of extraction, authorized use and the duration of the permission. The analysis made by the Water Allies captured in the Investment Committee paper in 2017 concludes that "*The enforcement of the allocated use is also at best ineffective, and in most cases non-existent. Furthermore, there is a lack of incentives for different water users to make a more efficient use of water, promoted by subsidies for agricultural water use in particular, which act as a perverse incentive for excessive water use*."

The impact analysis of the case is also highlighting key obstacles for the scheme:

- *"Lack of enforcement of volumes of water effectively extracted (so users who transfer their water rights might actually continue to use them afterwards);"*
- *"The high number of illegal wells and non-revenue water (estimated by official government figures to mostly be in the 25-60% range nationwide, and estimated at 44- 58% in Aguascalientes);*
- *Lack of continuity in government schemes which might affect the sustainability of the Water Banks beyond the next change of the federal government (2018).*

Based on such a diagnosis, the conclusion is that in these circumstances "*needs external help in order to actually reduce water consumption*", that is the development of a local stewarding strategy through the water fund of Aguas Calientes. This strategy was rooted in the necessity to team up and create a collective with an intermediation model to address the issue and properly

care for the resource. This is of course present in the interaction between the stakeholders but also with the construct of the water fund as an infrastructure to support that. We identified that there is a strong local and territorial aspect to the need to apprehend differently the resource and the way to steward it leading to different way of collaborating. Moreover, for the change to take place a strong need to look in the same direction is present which requires a pedagogical work of awareness. Without it, it would be foolish to imagine that local players would accept to go against what is perceived as their short-term interest.

Table 7 proposes additional data that we used in order to create the subcategories that together build the concept of stewardship.

Table 7: Data supporting analysis of "Stewardship of the resource"

	Evian case study	Aquacalientes case study
Giving value to the resource	"*And sincerely my action on the APIEME is most probably the one I am the proudest of when I speak about my work to my children*". Philippe Galois – APIEME website Interview "*There is a kind of emotional side attached to Evian, to the water [management] I'd say emotional because there is a whole ecosystem of individuals and communities in which employees are fully part attached to the resource I am authorized to exploit*" – Annick Moreau- Head of Public Affairs Danone Water- Interview	"*As there was no structure in place locally, we needed to identify the stakeholders that had a real interest in getting involved in the management of this resource and consequently the organization that could be put in place locally between them. »* Interview Laurent Auguste
Caring	"*We started with studies with the local agriculture chambers on soil. Then we went to meet the farmers directly to share the conclusion as well as the municipalities. I also go and meet the house owners to convince them to change their oil tank [to limit the risk of leakage and pollution]*" – Annick Moreau – Head of Public Affairs Danone Water – Interview "*We talk about a 15 year to 20-year cycle. In any case it is a long cycle which means that pollutions can be detected only 15 years after and if it happens there is nothing you can do anymore. When you understand that, this changes everything*" Bernard Giraud – President of Livelihood– Interview "*This collective work must continue. We have not yet finished the sewage sanitation,*	*"And so, to get there in Aguas Calientes, we set up all these things that humans need. And we need to have social constructs of champions and we need to have legal constructs of a vehicle and we need to have financing and long-term financing. But the intent really is setting in motion this idea of shared benefit and shared management of that resource over time".* Andrea Ericksson – Director Water Resource TNC – Interview "*We were also creators of a new model, building knowledge to be able to replicate this model of risk sharing management and resource sharing since they know that this shared resource requires this risk sharing and this investment sharing in several territories. So they want to model*

	every municipalities have not yet completed their spring ground catchment protection and we still have a lot of old oil tank that need to be replaced. The APIEME has a long life in front it." Jean Philippe Bened – APIEME President 2001-2008 – Media Interview	*their approach*." Jehanne Fabre - Water Resource Manager Danone – Interview
Proactive management	"*Today this is an association which utility is no longer challenged; it is perceived as a collective win-win*" Philippe Galois – VP Operation Danone Water – Interview "*The industrial activity is totally dependent from the Natural Resource which itself is directly dependent from the territory and on top this resource is bottled and sold with the name of the territory. It is an amazing territorial laboratory"* Bernard Giraud- President of Livelihood - Interview	*"Typically, Water Fund-type approach like in Aguas Calientes are collective ones, because on its own, one can't do it or it will be more effective to do it together and therefore it is key to know how to have the leadership to try to go back to a number of other stakeholders and set up new structures and management models. It also often means knowing how to make investments, looking for alternative technologies or approaches, partnerships, support and therefore really changing the way things work".* Laurent Auguste – Executive Vice President Veolia – Interview "*This vision only can create in turn a drive to action. It's the vision, it's the understanding that there is a common interest but not theoretical, a very practical understanding with an action plan, see an action plan, see a theory of change, see examples and say ok, actually, I believe in it if we do this together, we're all going to gain something"* – Jehanne Fabre – Water Cycle Manager Danone - Interview

3..3. Change and articulation of time horizons

Our data clearly indicate that the notion of time is of the essence when it comes to the protection of the water resource. We see a clear pattern and acknowledgment that the time horizon between the potential impact we can have on the resource and its exploitation the way to protect its purity or availability can create a misalignment for corporate leaders and manager vs. the short-term delivery of financial targets very often called the tragedy of horizon.

In the Danone case study, time is considered first in line with hydrogeological studies that demonstrate that Evian water journey from the catchment area last 15 to 17 years.

> *"Our natural mineral water gets its unique, pure cool, crisp taste from its 15-year journey through the Alps. It starts as snow and rain and infiltrates through the ground of our Impluvium before slowly travelling through layers of glacial rocks where it becomes naturally filtered and enriched with electrolytes and minerals." – Evian Brochure for Visitors.*

There is a clear perception that managers in Danone moved progressively form a defense or license to operate strategy to the one of stewardship linked to competitive advantage that a sustainable management of the resource can provide. This move is described as complex to operate in the corporate world as the decision are often described as dictated by short term imperatives.

> *"The spring was the place where we sourced water leverage the local provenance. All that was very good but in fact we gradually understood that if something would happen on the impluvium that would be really bad. The system was not sustainable. Finally, the idea of duration and continuity of the resource became the common objective". Bernard Giraud, President of Livelihood - Interview*

Danone Vice president in charge of Water operation highlights how the time dimension is critical and that executives are now much more equipped to take that dimension into account in their decision-making process.

> *"Such topics are ahead of the traditional management mechanisms although they are key to make good business […] the time scale we know have now is different from the one I had when I started my career. We progressed a lot to take long term impact into account. New criteria are now used to evaluate projects. Of course, profitability remains key but we now have a much more 360 approach". Philippe Galois – VP Operations Danone Water – Interview*

In Aguas Calientes, the tension between short term consumption and long-term availability for long lasting competitive advantage is even more salient that in the Evian case. What is striking is that the actors recognize that they changed their mind about taking into account a long-term approach of the resources, which was absent a few years ago.

> *"We did have a lot of thinking around our positioning and what we called at that time the short water cycle and the long water cycle. At that time Veolia's position was that our responsibility only lied on the short water cycle, meaning the human activities of towns on the resource without looking at the long water cycle with an assumption that availability was not an issue". – Laurent Auguste – Veolia Executive VP for New Business Model – Interview*

The representant of one of the water fund key stakeholders, made it very explicit that time horizon articulation is at the core of the new perspective of water management.

> *In Aguacalientes, times is also a key element as the resource depletion is not there yet but all indicators show that if nothings changes, water availability at the good place at the good time is at risk. The Aguas Calientes case offers 2 dimensions for us to explore when it comes to the time characteristics. First the time required to manage the resource in its natural cycle and second the time in which the different economic actors operate and traditionally corresponds to the way they can assess their success or failure. This is one of the elements that the water allies coalition is trying to reconcile through the water fund. And the way we've tried to work on it when you're working on that is to try to come back to that long-term sort of what is that long term benefit. And if we can't*

find solutions now for rebalancing, you know, what is at stake? At stake is at some point in the future, we're going to hit a crisis and you're going to be shut down, that the answer will be that you will have no water to use. Instead, let's find ways to start balancing the system so that everybody can be OK over the long term. Interview – Andrea Ericksson – Director Water Resource - The Nature Conservancy

Table 8 proposes additional data that support our analysis on articulating time horizon.

Table 8: Data supporting analysis of "Articulating time horizon"

	Evian case study	Aquacalientes case study
Articulating time horizon	"*The spring was the place where we sourced water leverage the local provenance. All that was very good but in fact we gradually understood that if something would happen on the impluvium that would be really bad. The system was not sustainable. Finally, the idea of duration and continuity of the resource became the common objective".* Bernard Giraud, President of Livelihood – Interview "*The water emerges at the foot of the alps in the town of Evian-les-Bains, where the Evian mineral was first discovered over 230 years ago. We have great respect for this region and the water it provides. For over 25 years, we've been in partnership with the local community to continue to protect this Natural Resource so our water can be enjoyed today, tomorrow and always".* Evian brand internet website	*"[In Aguas Calientes] the activity was generally based on the assumption that the resource is infinite and therefore that we can take as much and as long as we want without any impact. There was an increased awareness that there was a limit, and what needs to be done to have a more sustainable management of this resource so that it is available for the time when it will be needed in the future*i. Interview Laurent Auguste – Executive Vice President Veolia *"Water is not equal across time, it is not equal within one calendar year, because it has it's raining seasons and dry seasons linked to the local context. It also has longer cycles of drought and wet seasons. So you can't manage for water just on one point.[….] And it's also true that we could absorb all of that. I mean, there are people that may make their money now thinking, hey, I got this aquifer here. I'll just sell this water now and we'll be done. 50 years will share this business. Then that resource is gone. And so that's not an overtime moment, that is a short term 50 years, maybe that's a good business deal for one family company, but that recharge and that regeneration of that system, that is not available for future people. And so if you have generational time in mind, you have to think about the regeneration cycles that a limited resource has".* Interview Andrea Ericksson – Director Water Resource TNC

4.3. RENT APPROPRIATION

Our last dimensions sheds light on the fact that, in both cases, pre-competition way a key component that was implemented by the companies and their allies not only for doing good, but for doing business while doing good. In other words, pre-competition helps the companies doing business and appropriate a rent, the basis of which is getting secured though pre-competition.

Indeed, in the evian case, pre-competition has become a key factor of reassurance for the consumers and therefore a differentiating factor for the marketing teams.

> *"today (water protection) has become a key element of credibility for our strategy and even of the mineral water category existence: The category is heavily challenged on plastics and therefore being a responsible steward of the resource in conjunction with local communities is a key differentiator" – Philippe Galois the VP Operations of Danone Water - Interview*

The way Danone operates is clearly considered as a way to gain a competitive advantage on the market, but without harming the natural resource. Danone VP for Water operations

> *"[I] am observing that the competitive advantage is slowing moving away from the product itself to be located in the supply chain. Depending on the sector it can be on the downstream part of the supply chain, the distribution and road to market, or in the case of water in the upstream part i.e. how do you respect Natural resources". Philippe Galois – VP Operations Danone Water – Interview.*

To conclude the evian case, we conducted and interview of Emmanuel Faber then CEO of Danone. In this interview, we explained him our analysis to make him react to our view. He offered a very useful perspective corroborating that Pre-Competition was not a negation of competition but a new way to ensure its competitive advantage on a resource constrained world:

> *"I think that the relationship between competitive policies and rent theory, is not a bijection. The way we think is not "ah there is a problem on the resource and on the rent" so mechanically I move to a Pre-Competitive thing, which is also collaborative and more inclusive. The reality is more nuanced and surely more, how to say also, more competitive. And that's why Pre-Competitive strategies are building a competitive advantage. Pre-Competition, you do it because you feel that it maintains, it builds, it distorts but at the end will allow you to develop your competitive advantage". Emmanuel Faber – CEO Danone – Interview.*

In the Aguas Calientes case, the project's inception took place at a moment when Veolia's. subsidiary in the regional state named CASA was in negotiation with the Aguas Calientes municipality to renew its water concession. Such context led to an acceleration of the discussion on how to preserve better the water resource in the region as a whole with of course potential conflicting interests. In this view, once Veolia and its partners of Water Allies, Veolia can lead

its business and appropriate economical rent from this activity. One of the Water allies' partners stressed the real threat that was on Veolia at that moment and the fact that if could ruin their business:

> *There was contamination of water with metals found deep in the groundwater. Lots of clues that showed that the question of water had to be answered and the municipality seized the question by saying they were going to make it a priority and moreover, by making it a priority, they threatened Veolia lose their concession for water management in this state, in this municipality if they themselves did not participate in the solution" Stephane Perrier- Livelihood Venture COO – Interview*

As well, Veolia head in Aguas Calientes stresses that the strategy they operated falls in line with their long-term rent appropriation and the challenges that remains in this strategy, i.e. being profit making through applying pre-competition.

> *On the long water cycle where we need to capture the issue of the resource, the challenge is the profit-making capacity linked to the externalities and the lack of counterparts to manage the resource together. But nevertheless, I was convinced that we needed to expand our perimeter of action, and this is way we were supportive of the creation of the Aguas Calientes Water Fund" Laurent Auguste - Interview*

4. DISCUSSION & CONCLUSION

Previous attempts to improve RBV have been developed, for example to take into consideration the fact that resources may come from external actors of the company (Teece, 1998, Lavie, 2006), or to consider how natural resources lead to fine tune initial RBV statement (Hart, 1995). Our study proposes to go into this last direction while proposing pre-competition as a condition for RBV to overcome the time horizon paradox of RBV when it comes to consider how competitive advantage builds on depletive natural resources. Our research as stressed that the way RBV articulates rent appropriation and the way companies can use natural resources have been too little explored. Confronted to a time horizon issue between short term rent appropriation and maximization and long-term availability of the resource, companies have to develop strategies that enable them to secure a sustainable use of the resource. Our paper show that companies develop pre-competition, a collective strategy that articulates drawing on specific characteristics of the resource, stewardship and articulating time horizons.

4.3. PRE-COMPETITION AS AN INITIAL CONDITION FOR RBV TO BE APPLIED TO DEPLETIVE NATURAL RESOURCES

As seen in our Literature Review, a restrictive view of the RBV is somehow static and limitative since the origin of the RBV is anchored in the understanding of how soft resources (managerial capabilities) triggering an over-emphasis of the RBV on non-physical resources (Bansal & Knox-Hayes, 2013; George et al., 2015). Physical resource become a "factor" or ordinary resource (Warnier, Weppe & Lecoq, 2013). We believed this vision is highly disconnected from the context in which organizations are operating since more than half of the world GDP is dependent from Natural Resources according to the world economic forum.

Our work implies that a pre-Competitive strategy can help to complement the RBV looking at the conditions under which the RBV could operate without rent appropriation as a structuring in "house assumption", enabling therefore the possibility to envisage sustainable competitive advantage attached to an exhaustible Natural Resource.

In that context Pre-Competion will imply a pre-screening and qualification of the resource at stake before applying the RBV framework. Looking at the resource the scholars should whether the usage of the resource prevails ownership, the long-term management of the resource prevails its exploitation and the collective management prevails its appropriation. If the 3 conditions are met then a specific strategy must be developed to ensure the specific characteristic that can create differentiation is fostered (rarity and availability in the case of Evian and Aguas Calientes), the time dimension necessary for its management considered (Long Water Cycle on both cases) and finally a stewardship strategy developed (development of specific governance mechanism for APIEME, Water Fund).

As seen earlier a restrictive view of what the Resource Based View of the Firm would separate capabilities that are internal vs. external. We believe this distinction could be challenged and that the Pre-Competition could serve as a link between the Resource Based View of the firm and the Resourcing Theory. Indeed, Pre-Competition is detailing the conditions and the characteristics for corporate to identify how Natural Resource can create long-term competitive advantage (RBV) and at the same time how to protect the key characteristic of the resource to preserve its usage (Resourcing) as a differentiating factor.

4.3. REFINING NATURAL RESOURCES-BASED VIEW OF THE FIRM

The findings of paper certainly calls for a fundamental review of the NRBV developed by Hart (1995). At this stage of our research, we cannot emphasize enough that what has been the most advanced attempt to consider the ecological constraints in the RBV are at best anecdotical. We have seen how the framework composed of 3 "interconnected strategies": pollution prevention,

product stewardship and sustainable development was extremely limitative selecting angles that are extremely operations driven even in a most recent attempt of Mc Dougal, Wagner & McBride (2019). Hart in his proposal is not challenging the Ricardian rent appropriation concept and is therefore restricting the impact of managing the Natural Resource scarcity increase to either cost avoidance, optimization, or access to market. He however recognizes the need to take into consideration a nonrestrictive view for the RBV and opened the door to its application to several case study on Natural Resources.

According to us pollution prevention, product stewardship and the always surprising in the list sustainable development are not complementing the VRIN and RBV framework. They just list potential actions that can be taken to maintain a competitive advantage linked to an exhaustible Natural Resource. However, they can be one out of many others and have on top a very Malthusian perspective which calls to do less of something to reduce its impact or protect its license to operate. This articulation can of course be valid but at the same time extremely limitative as many sustainability topics are linked to acceleration of solutions (doing more of something) and/or working differently.

For instance, we need less carbon emission so less coal energy which could relate well to the pollution prevention proposed by Hart, but we also desperately need more trees, carbon sequestration in the soil, greener innovation. For instance, the rising theme of Nature Based solutions cannot be apprehended with Hart's view. Nature based solution are defined by the IUCN as "actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits"[4] . Nature Based Solution have the potential to deliver up to 37% of the Paris climate goal, as well as the potential to help address other societal challenges while being good for business and people[5] according to the World Business Council for Sustainable Development (WBCSD). Hart's view therefore does not embrace the potential for green innovation, collective management of protection and restoration efforts and the highly strategic need to scale up green solutions rapidly to face the key challenge of our times. Pre-Competition offers a potential to identify the conditions and characteristics under which the Natural Resource can be managed without having resource appropriation as its core

[4] Ecosystem Management work - IUCN Global Standard for Nature-based Solutions | IUCN

[5] New WBCSD report helps business accelerate consistent and credible actions for climate and nature. - World Business Council for Sustainable Development (WBCSD)

assumptions. Once new time horizon, the specific characteristic of the resource identified, and a stewardship strategy embraced the pre-competitive strategy can tun as a basis to a sustainable competitive advantage and the capabilities develop it turns into a true rent generator. Pre-Competition can thus help corporate to maintain the long-term availability of the Natural Resource and at the same time offers a framework for corporates to get organized to reach that objective which leads us to the potential implication of our work for economic actors.

4.3. BOUNDARY CONDITIONS

Our research only draws on one type of natural resources that is water. Water depletion is real, and at the same time the amount of water on earth does not change through the centuries. It would be possible that the strategies we have identified for water would be slightly different for other natural resources. For example, oil has a much longer regeneration cycle and requires heavy financial investment to identify and exploit. On the opposite, soil richness can be highly regenerated though regenerative agriculture. The variations in required time and amount of investment could challenge the way pre-competition is implemented.

Also, we have analyzed pre-competition in the water sector in areas where geopolitical issue of water remains low. Euphrates, Tigris, Jordan, Nile, Danube and Okavango rivers as well as the Tibetan waterfalls that have been identified as potentially emergent conflicts areas linked to water scarcity within five to ten years. We could imagine that in areas where political struggles are linked to water pre-competition may be harder to implement, as important political stakes may interfere in the way the resource is managed.

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