Managing natural resources in a sustainable way

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Résumé :

This article aims to understand the underlying mechanisms of sustainable natural-resource management. By defining natural resources through their uniqueness and finitude, we show that considering natural resources in a sustainable way involves valuing them based on their context of production rather than on their price. Thus, natural-resource management entails finding complementarities between different resources and involves collective process of self-management as well as idiosyncratic local and situated management solutions. To understand what it means in practice, we build in four cases of initiatives from different industries and find that it implies reshaping the value of the resources and reconstructing an industry. In doing so, this article shows how industries can develop to tackle the sustainability issue, it offers a renewed conceptualization of natural resources that can be fruitful for the CSR literature, and shows that sustainable entrepreneurs are at the core of the natural-resource management. It also offers political implications.

Mots-clés : Natural resources, CSR, Anthropocene, common goods, industry emergence, multiple case study

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1. INTRODUCTION

The management of natural resources is one of the grand challenges of our world (George et al., 2015, 2016). For instance, Shapiro et al. (2018) denounced the different harms caused by extractive industries in terms of environmental, social and governance issues. While resource scarcity has been on the agenda of economists, politicians, and environmentalists for centuries, it has hardly been studied by management scholars (George et al., 2015). Reasons are threefold. First, this is due to the overuse of the resource-based view of the firm developed by Jay Barney as the main framing that addresses the scarcity of resources that defines resources' rareness as imperfect market competition and thus overlooks the sustainable issue (see Barney, 1991; George et al., 2015). Second, research has neglected the study of the physical materiality of the natural environment as it is seen as less important than the intangible aspects that characterize the nature of management itself (Bansal & Knox-Hayes, 2013; George et al., 2015). Third, much effort has been spent making the business case for CSR (e.g., Etzion, 2007; Kaplan, 2019), rather than making suggestions regarding how to make business practices more sustainable.

To put the natural-resource scarcity at the research agenda, this article responds to recent calls for understanding the emerging strategies that have been developed to tackle such issue. For that purpose, it builds on a diversity of theoretical outlooks (George et al., 2015; Nyberg & Wright, 2020; Wang et al., 2020; Wittneben et al., 2012) and focuses on industries where the issue is at hand (Bansal, 2019; Sharma, 2019). Thus, we aim to respond to the following research question: *How to manage natural resources in a sustainable way?*

To understand the underlying mechanisms of natural-resource sustainability, we first build on the literatures of the commons and of the Anthropocene to conceptualize natural resources as being finite, unique and thus context-dependent from a strategic standpoint. This leads to understanding the management of natural resources as finding complementarities between different resources and involving collective process of self-management as well as idiosyncratic local and situated solutions. To specify how these natural resources are managed in a sustainable way, we scrutinize four sustainable initiatives that take place within three industries: the fresh-cut flowers, the fishing, and the textile industries. We find that each of

the resources in use has evolved depending on its context of production. Developing the initiatives involved reshaping the value of the resource in the new context and reconstructing an industry. These findings make three theoretical contributions. First, by developing the mechanisms of natural-resource management, we aim to show how it can lead to the emergence of an industry or of a new strategic group. Second, in response to the different attempts to understand how to better manage natural resources, we argue that our cases offer novel theoretical insights. Third, by putting sustainable entrepreneurs at the core of the initiatives we have uncovered, we show their centrality in the natural-resource management. This article also offers political implications.

The remainder of this article is organized as follows. Its first section conceptualizes natural resources from an organizational viewpoint. Building on these conceptualizations, it develops in a second section how organizations manage natural resources. The third section then shows the four cases and the method at hand that is being mobilized to understand how to manage natural resources in a sustainable way. The fourth section develops our investigation that we discuss in a fifth section where we also show its implications for politics.

2. MANAGING RESOURCES

2.1. CONCEPTUALIZING NATURAL RESOURCES FROM AN ORGANIZATIONAL PERSPECTIVE

The management literature has mainly addressed the concept of resource by relying on Barney's (1991) framework. Indeed, the resource-based view of the firm assumes that resources are subject to imperfect competition as they are unequally distributed across organizations. Thus, the theory's main argument is that organizations develop a competitive advantage based on this initial allocation of resources: the scarcer the resource, the higher its contribution to the organization's competitive advantage. However, as highlighted by George et al. (2015), this assumption has led to two limits regarding natural resources. First, as they are highly regulated, there is a risk of government appropriation, etc. leading to important tensions on resources. Second, as the price of natural resources is either set in private negotiations or heavily subsidized, natural resources are subject to speculation. As a consequence the behaviors are focused on maximizing the potential profit of the resource instead of dealing with sustainability issue.

Following George et al. (2015) who urge to look for other conceptualizations of resources than the resource-based view of the firm as well as numerous authors who suggest looking for new theoretical lenses to tackle the sustainability issue (Nyberg & Wright, 2020; Wang et al., 2020; Wittneben et al., 2012), we build on the literatures on the commons and on the Anthropocene that have specifically conceptualized natural resources as being finite and being unique. Going back to the strategy literature, we then show that rather than evaluating natural-resource scarcity based on price, we should rely on their context of production to consider their finitude and uniqueness.

Rather than being conceptualized based on their price, natural resources have also been conceptualized based on their finitude. In fact, in the 'Tragedy of commons', Hardin (1968) shows that as individuals act independently in their own self-interest, they behave contrary to the common goods and deplete or spoil shared resources through their collective action. As humanity overexploits an increasing amount of natural resources, such behavior leads to their exhaustion. Thus, Ostrom (2008) calls these resources *'common-pool resources'* and defines them as *'resources [that] are sufficiently large that it is difficult, but not impossible, to define recognized users and exclude other users altogether'* (p. 11). They are threatened by overfishing, deforestation, but also massive carbon dioxide emission or the decrease of groundwater.

Natural resources have also been conceptualized as being unique. Given the boundaries of the Earth, the finitude of its ecosystem and of its growth, some scholars believe that the economic sphere should stop valuing resources as infinitely renewable, and consider them as unique, as it is the way human beings are considered (Beacham, 2018; Gosling & Case, 2013; Purser et al., 1995). Accordingly, natural resources have an intrinsic value regardless of their utility to humankind and each resource cannot be substituted with one another (Heikkurinen et al., 2016). Following this line of argument, resources are all given an equal value and cannot be priced on a market.

To take into account the finite and unique nature of natural resources, organizations cannot conceptualize natural resources through their sole contribution to the competitive advantage of the organization (Barney, 1991). Thus, we need to focus on how organizations consider their "vast reservoir of unpriced resources" (Lippman & Rumelt, 2003). In fact, organizations can not only gain a competitive advantage based on the highly priced natural resources, but also on natural resources that are especially efficient or especially valued in some use (Penrose, 1960). As Penrose (1960) illustrates, an organization grows by drawing upon both

acquired and inherited natural resources that are obtained from the market (Penrose, 1960). Resources that are not being used by the organization are potential opportunities to innovate and incentives to expand the organization.

Indeed, beyond building their competitive advantage based on strategic resources that are highly valued, organizations also rely on ordinary and junk resources which represent the bulk of resources available inside organizations and on the factors market (Fréry et al., 2015; Warnier et al., 2013). The former comprise *'common resource[s] on the market, generally perceived as neutral in terms of performance, i.e. with an expected level of productivity equivalent to its cost (acquisition or development)'* (Warnier et al., 2013, p. 1369) while the latter are overlooked, ignored or even destroyed by organizations because they are not highly valuated on the market or considered as a cost. They are *'generally perceived as negative in terms of performance, i.e. with an expected level of productivity lower to its cost (acquisition or development)'* (Warnier et al., 2013, p. 1371).

2.2. MANAGING NATURAL RESOURCES AT THE ORGANIZATIONAL LEVEL

After conceptualizing natural resources from an organizational perspective, this section focuses on their management. While the literatures on the Anthropocene and on the commons take an ecosystem perspective on the management of natural resources, they also offer organizational-level ways to manage resources, as does the Penrosian perspective whose level of analysis is the organization.

While the literature dedicated to the commons has focused on governance systems to control common-pool resources, what Ostrom (1990, 2009) has called the "socio-ecological system", a sub-field of research has focused on "commoning", the activity that leads to the collective production and use of shared resources (Fournier, 2013). By concentrating on alternative forms of organizing that would allow commons' preservation and extension of their access (e.g. Kostakis, 2018; Meyer & Hudon, 2017), the literature shows that organizing in commons involves shifting away from exclusive appropriation to a collective process of self-management (Fournier, 2013).

Similarly, the literature on the Anthropocene also looks for alternate ways of doing business that rely on pragmatic and concrete actions, for instance local and situated solutions that imply a holistic vision and technical design practice (De Cock et al., 2019; Hoffman & Jennings, 2015; Roux-Rosier et al., 2018). However, while scholars have tried to bring concrete examples of solutions, they still remain largely unexplored, despite the impetus to

rethink organizational modes (Wissman-Weber & Levy, 2018). Among them, Corvellec (2019) suggests mobilizing resources differently along the value chain, Roux-Rosier et al. (2018) suggests new organizational forms such as permaculture that mimicry the ecological pattern to design its process and Wissman-Weber & Levy (2018), new ways through which cities can take into account probable climatic changes, for instance by no longer building in flood zones. Overall, an ecocentric management of resources would urge organizations to rebalance the nature-human relationship by considering the resources intrinsic essence and preserve it, as does permaculture by respecting the natural cycle of seasons.

Finally, according to the Penrosian perspective on resources, the competitive advantage of organizations can be built on the combination of both unused and used. It occurs by linking resources from different activities, or by diversifying through technology or through the market (Penrose, 1960). Indeed, value is created by taking into account complements and substitutes among activities (Stieglitz & Heine, 2007). The complementarity between resources occurs when their combination leads to the creation of a "surplus" over and above the sum of the amounts of value they could create independently (Adegbesan, 2009). Thus, it is not that much the value of the resources that determines the competitive advantage but rather the capacity of the organization to combine them through creation, evaluation, manipulation, administration, and deployment (Lippman & Rumelt, 2003). For instance, an organization can develop a competitive advantage by accumulating funds or ideas that by themselves do not create any value. This is the basis of the crowdfunding and crowdsourcing business models (Fréry et al., 2015).

Such combination, however, necessitates the coordination of complementarity assets and activities (Stieglitz & Heine, 2007). It can lead to scientific discoveries or new technologies that would trigger new industries (Agarwal et al., 2017; Gustafsson et al., 2016), or can constitute a new strategic group within an existing industry (Fiegenbaum & Thomas, 1993; McGee & Thomas, 1986). Regarding the latter, Penrose (1960) takes the example of the Hercules Powder Company that entered new industries in a new strategic group by putting on the market a new technology or a product at lower cost because it is the by-product of another resource it possesses for another industry.

Overall, this section as shown that managing natural resources entails finding complementarity between different resources, involving collective process of self-management as well as idiosyncratic local and situated solutions that are more respectful of natural resources. More is, however, needed to understand how these natural resources are

managed in a sustainable way. 'Who are the actors involved in the process?' or 'How is value created?' are two of the many different questions that remain to be answered. For that purpose, the next section investigates four initiatives for which a sustainable way of managing natural resources has been developed.

3. METHODS

3.1. CASE JUSTIFICATION

We build our research on multiple-case study (Eisenhardt & Graebner, 2007). We focus on the fishing, the fresh-cut flower and the textile fiber industries as these three industries have been publicly denounced as being responsible for the acceleration of resource depletion by various reports emanating from NGOs or government bodies. For instance, a report published by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services stated in 2019 regarding the fishing industry that "[i] n 2015, 33% of marine fish stocks were being harvested at unsustainable levels; 60% were maximally sustainably fished, with just 7% harvested at levels lower than what can be sustainably fished."[1] In each of these industries, by relying on word-of-mouth and by reading the specialized press, we looked for initiatives that manage the resources in a sustainable way. We focused on four of them for generalization purpose, namely *Poiscaille*, the *Slow Flower Movement*, *Virgocoop* and the *Tricolor Project* as they rely on unique and finite resource that they apprehend as depending on their context of production, as detailed in Table 1 and detailed hereafter.

Industries	**Cases**	**Finitude**	**Uniqueness**	**Context-dependent**
Fishing	*Poiscaille*	Fish stocks	Unique taste, novelty, 'forgotten' species	Ultra-fresh, seasonal
Fresh-cut flower	*Slow Flower Movement*	Water, air pollution	Unique flagrance, unique look, etc.	Local, seasonal
Textile fibers	*Virgocoop (hemp)*	Water, air and soil pollution	Each fiber has its own qualities (light, resistant, heat-regulating…)	Local, less polluting
	Tricolor		Each fiber has its	Availability of

[1] https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

	project (wool)	own qualities (cheap, light, resistant, heat-regulating…)	the resource

Table 1: cases justification

3.2. CASE PRESENTATION

Focusing on 'forgotten' species to avoid overfishing. While 90% of fish stocks are used up, most governments around the world allocate catch limits for the most pressured species. However, these initiatives are highly controversial as quotas may not be restrictive enough to allow the renewals of the fishing stocks. Thus, local initiatives have developed as is the case of the French start-up *Poiscaille* that sells 'forgotten' species, i.e. fish species that are currently neglected by consumers despite offering unique tastes that consumers can eat less than 48 hours after being fished thanks to a subscription model and to partnerships concluded with independent fishermen who adopt sustainable fishing practices and are paid on average 20% higher than the market in return.

Supplying local fresh-cut flowers against a global value chain market. The fresh-cut flower industry is seen as harmful to the environment. Indeed, cut flowers are usually cultivated in opaque conditions and traceability is low. Fighting against these practices, an initiative called the *Slower Flower Movement* is born in the US with the willingness to encourage sales of locally grown cut flowers by highlighting their availability throughout the year. The initiative has then duplicated in Australia and Europe.

French hemp and French wool as alternatives to cotton. The textile industry mostly relies on cotton. This fabric has, however, been highlighted as being detrimental to the environment. Given the stigmatization of cotton, hemp has resurfaced: it needs 10 times less water than cotton to grow, the plant is stronger than cotton and does not need pesticide. The hemp fabric is more resistant than cotton and lasts longer. *Virgocoop*, a French cooperative, tries to rebuild the French hemp industry. Wool can also be an alternative to cotton. While sheep needs to be sheared each year to stay healthy, the price of wool does not cover the price of the shears and wool is perceived as a wasting material. The *Tricolor project* is an initiative that aims to rebuild and valorize the French wool industry for textiles.

3.3. DATA COLLECTION

For each case, we collected data aimed at understanding the underlying mechanisms of natural-resource management to write a 15-page comprehensive report for each case. For

instance, it took the shape of a teaching case for the hemp and for the fishing industries (see Ambrosini et al., 2010; e.g., Parigot, & Carton, 2020). To reach this goal, we first collected primary data. They include interviews with key actors of the industry and of the initiative as well as attending trade shows to discuss and understand the value creation mechanisms within the industry. For instance, for the case of *Poiscaille*, we conducted several interviews with the founder of the start-up that lasted about an hour at different stages of writing of the report and for the cases of the textile fiber industry, we attended two trade fairs to discuss with actors from the initiatives and improve our understanding of the industry. Second, we collected secondary data. They consist in press articles related to the different initiatives for which we had a systematic data collection by relying on Factiva, on netnography as we did for instance for the case of the *Slow Flower Movement* by systematically reading Debra Prinzing's blog who initiated the movement in the US that she has held since 2007 and other related materials (Kozinets, 2010), and on various other documents including reports, historical books and academic article to apprehend the history of the fiber as has been the case for the hemp, as well as booklets and documents that were structuring in the creation of the initiatives. Table 2 provides an overview of the data collected.

Cases	**Poiscaille**	**Slow Flower Movement**	**Virgocoop**	**Tricolor project**
Primary data	Interviews with the founder	N/A	Trade fair	Interview Trade fair
Secondary data	20+ press articles 50+ weekly newsletters	150+ blog posts and related websites 3 books 30+ press articles	20+ press articles 15+ books and academic articles Booklets	20+ press articles Booklets

Table 2: data collection

3.4. DATA ANALYSIS

We inductively analyzed our data following three steps. First, building on the reports, we first adopted a descriptive lens to understand how the industry currently works and what the local initiatives we focused on specifically consist in. It involves understanding the different resources that are mobilized and the actors who exploit them. Second, we tried to find commonalities between the cases. For that purpose, we inductively coded our different documents and came out with two main elements that have been central in the constitution of the initiatives: rethinking the value of the resources and reconstructing the industry (Strauss &

Corbin, 1990). Third, in a third and last step, we systematically investigated our data to see how these two mechanisms have been put in place. Next section details our findings.

4. FINDINGS

4.1. A RESOURCE VALUE THAT EVOLVES DEPENDING ON THE CONTEXT OF PRODUCTION

Our findings show that the value of the different resources that we have investigated – 'forgotten' fish species, local fresh-cut flowers, French hemp and French wool – has varied over time. Even if some of them have been considered as strategic for a long time, they have become obsolete, mainly because of the industrialization of the economy. But, in a context where environmental issues are raising, they have acquired new advantages.

An evolving valuation of the resources

The valuation of the different natural resources has evolved over time, from being central to a given industry and then, given the apparition of substitutes at lower price, they have been disrupted. The example of the hemp in the textile industry illustrates well that point. While the hemp culture was very dynamic until the 18th century, especially for making ropes and veil which made the fiber a strategic asset for transportation, it slowly became marginalized under the combination of different elements (Deitch, 2003). As the cotton transformation process became automatized at the beginning of the 19th century, this natural resource quickly became more economically competitive than hemp and replaced it for textiles. In the 20th century, the petrochemical industry then outperformed the hemp fiber with nylon and the hemp transformation process called *retting* became increasingly controversial because it is highly polluting. Because of these three elements, hemp culture has almost disappeared in France until the 1960s where it reappeared within different industries (e.g., paper industry) but not in the textile industry where it has been overtaken by cotton and synthetic fibers.

A new context that acts as a triggering giving second chance for these resources

Since the publication of the Brundland report in 1987 that popularized and defined the term 'sustainable development', diverse actors, including NGOs or journalists as is the case for the cut-flower industry (see Stewart, 2008), have denounced the resources that are commonly used for being too polluting. For instance, the discourse on cotton has evolved during that period. Public opinion has started criticizing cotton for being the third most water-intensive crop and a highly polluting fiber as it needs an important quantity of pesticides. In

comparison, other fibers have appeared as being more "environmentally competitive", such as hemp that necessitates 10 times less water than cotton to grow, and that is stronger than cotton and thus does not need pesticide. These observations have led to entrepreneurial impulses.

Entrepreneurs impulse

Some entrepreneurs have seized the discourse aimed at reinventing industry practices to implement sustainable resource management practices. Pushed by environmental convictions, they have developed initiatives putting these discarded resources at the center of their project. The entrepreneurs are often outsiders of the industry as they did not necessarily work in the industry before starting their project. For instance, Charles Guirriec, the CEO of *Poiscaille*, has worked as an observer for the French Institute of Research for the Exploitation of the Sea where he studied fishermen's work and monitored the evolution of the fish inventory resource and then had a job position in the Ministry of Ecology Sustainable Development and Energy where he oversaw the attribution of subventions in the fishery industry and realized the limits of the political action against overfishing. He does not think that state regulation by itself can change how the fishing industry works in the short run. Thus, rather than creating an NGO or gathering within a network defending sustainable fisheries, he put in practice his own convictions by creating the start-up *Poiscaille*.

The initiatives of our cases take different forms, either network as is the case with the *Slow Flower Movement* in the cut-flower industry, a cooperative as is the case Virgocoop, or organizations for *Tricolor Project* and *Poiscaille*. The form of the initiative does not seem to have any impact on the initiative, as all the initiatives have strived to act as mediators by reshaping the value of the resource and by reconstructing an industry, as developed in the next two subsections.

RESHAPING THE VALUE OF THE RESOURCE

To reinstate discarded resources within the industry, they must be given a credible value. It involves communicating the resource that does not rely on rarity but is rather context-dependent, establishing a proof a concept, using the past as well as innovation to legitimate the value and making specifications.

Determining a new combination of resources

We found that entrepreneurs produce a detailed discourse to explain to stakeholders how the resource offers value. Some resources involve a change of the intrinsic value of the products or services being sold in comparison to the ones in use in the industry. Indeed, one of the arguments that the *Slow Flower Movement* puts forward is that local fresh-cut flowers last

longer than imported flowers due to their accustoming to the weather conditions of where they are being used. Here, the value is just different from the value of beauty which is usually advertised by proponents of imported flowers. On the other hand, the value can be developed by combining the resource with others. If the fishes sold by *Poiscaille* are 'forgotten' by the other actors of the industry, it is because they are usually less tasty and more delicate than traditional fishes. To compensate these elements, *Poiscaille* has innovated its supply chain to deliver fishes within 48 hours (or 72 hours outside the Paris area) and thus guarantees freshness; it has also partnered with fishermen in different coasts to offer a diversity of fishes. The values of freshness and diversity are thus found elsewhere along the value chain and coupled with the reliance on 'forgotten' fishes, they contribute to constituting the competitive advantage of *Poiscaille*.

The *Tricolor project* epitomized how entrepreneurs combine intrinsic value of the resource with other resources to develop a credible competitive advantage. It highlighted the wool distinctive values based on its eco-friendly values, its technical performance, and the fact that it is produced in France. First, regarding the eco-friendly values, jean producers who take part in the Tricolor project promote the idea that transforming the wool into thread and then into fabric does not need much water and argue that zero waste is left. Furthermore, these jeans are of high quality and thus last longer than regular jeans. Their argumentation draws on the slow fashion movement. Second, regarding the technical performance of wool, they are based on the properties of the wool: wool-made jeans are heat-regulating. Thus, they can be worn all-yearlong, keeping warm during winter and cool during summer. The third argument is based on the fact that jeans are entirely produced in France – from the wool to the jeans. Buying them means supporting the French economy and French know-how. In addition, as every step of the productions is made locally, the carbon footprint is lower than for regular jeans that have travelled all over the world. Here, *Tricolor project* draws on the Made in France label which has been quite trendy this last decade.

Establishing a proof of concept

Actors must prove that the industry can create value thanks to this alternative resource. To do so, they produce various artefacts showing their viability. They write books, produce podcasts, give interviews in order to disseminate and inscribe the value. Debra Prinzing, one of the entrepreneurs of the *Slow Flower Movement* published a book where she crafted a different bouquet for each week of the year to prove that it is possible to have local-flower bouquets around the year (Prinzing, 2013), and then launched a contest on her blog to

encourage people doing the same. Similarly, *Atelier Tuffery* produced and commercialized jeans 100% made of hemp fiber to prove the commercialization of a product made of hemp at a competitive price. Trade shows play an important part in this process. *Tricolor project* is present in different trade shows, among them Première Vision, the leading trade fair in the clothing fabric industry (see Rinallo & Golfetto, 2006), to make their project visible to other professionals and also to be considered as peers.

Entrepreneurs also seek to prove the economic viability of this alternate model of resource management. In fact, the four initiatives we investigated are not charities but for-profit initiatives. For instance, to launch in 2014 the website slowflower.org, "an online directory to help […] find florists, studio designers, wedding and event planners, supermarket flower departments and flower farmers who are committed to American grown flowers."[2], Debra Prinzing raised US$18,450 by relying on crowdfunding. The website runs based on the subscription of organizations to the directory. Similarly, *Poiscaille* does not rely on grants and thus must have a profitable business model.

Building on the past as a legitimacy tool

To strengthen their arguments, entrepreneurs often refer to the past, explaining that this alternative resource was widely used by the industry before changes occurred. By doing that, they rely on the argument that if it worked before it can certainly work again. For instance, the *Tricolor Project* communicates on the fact that before the wave of delocalization that occurred in the 1960s in France, the French wool industry was blooming and was entirely managed on the French territory from animal breeding to knitting. The aim of the project is simply to do what has been proven to work in history. However, building on the past does not mean going back to ancient times. For instance, while *Poiscaille* promotes the use of 12-meter-long boats with no more than three fishermen onboard boats for its suppliers instead of trawlers and sustainable fishing methods including passive gear, line fishing, anchored floating nets, trammel nets or traps instead of modern technic that damage the seabed, the organization relies on an innovative distribution platform with an innovative business model based on subscriptions.

Making specifications

Entrepreneurs also provide specifications for their combination of resources. Their goal here is to stabilize it and make it replicable. It also helps not to deviate from the initial purpose:

[2] https://www.indiegogo.com/projects/slow-flowers-a-directory-of-american-flowers-florists-designers-farmers#/

crating value in a competitive and sustainable way. For instance, some initiatives have strictly made specifications as is the case of the *Slow Flower Movement* for which a manifesto has been written in 2017 which builds on 5 points[3]:

> *Slow Flowers commits to the following practices:*
> - *To recognize and respect the seasons by celebrating and designing with flowers when they naturally bloom*
> - *To reduce the transportation footprint of the flowers and foliage consumed in the marketplace by sourcing as locally as possible*
> - *To support flower farmers, small and large, by crediting them when possible through proper labelling at the wholesale and consumer level*
> - *To encourage sustainable and organic farming practices that respect people and the environment*
> - *To eliminate waste and the use of chemical products in the floral industry*

While this is the state of the art of the specifications, other initiatives have less formal specification as is the case of *Poiscaille* for which its CEO argues that while he is at the head of the firm *Poiscaille* will never cross the line of partnering with fishermen with boats longer than 12 meters or fishermen who do not strictly follow sustainable fishery technic. In fact, as this new combination of resources has become the identity of the initiatives, it cannot change it if it were to build an industry.

4.2. RECONSTRUCTING AN INDUSTRY

Beyond reshaping the value of the new resource, creating value based on the new resources also involved reconstructing up an entire new industry. Our cases show the necessity to convince and bring actors to the initiative and gather skills and technical resources. We also found that entrepreneurs develop small-scale initiatives at first and raise the question of scaling up.

Convincing actors to adopt the new resource combination

In our four cases, we found that drawing on ordinary resources involves the creation of a network of actors that differs from the one currently operating in the industry. Indeed, current actors of the industry have organized for extracting strategic resources. As ordinary resources differ, it is necessary to gather actors with novel competencies within the industry and to connect them together. The most obvious example comes from the *Slow Flower Movement* initiative that relies on local growers who are located less than 50 miles (80 km) from flower

[3] https://slowflowersjournal.com/index.php/2017/04/14/a-slow-flowers-manifesto/

shops rather than on the current actors of the industry who are settled in Latin America and Africa and connect with flower shops through Holland and regional markets. In fact, entrepreneurs are confronted with different issues when it comes to convince these actors who currently operate in the industry.

First, the alternate resource can be mobilized in a different industry, meaning that the value is extracted differently from the resource. Entrepreneurs thus need to convince the upstream actors of the value chain to switch from an industry to another. For instance, regarding hemp, even if France is the second-largest hemp producer in the world after China, most hemp production is currently dedicated to other industries than textile, such as construction materials or animals (bait or litter), as textile represents less than 1% of the output. Thus, textile producers do not know how to transform hemp fibers into yarns and wave them into denim fabric, and the textile industry does not know how to use this fabric to make clothes.

Thus, as *Virgocoop* had no other choices than rebuilding the textile hemp industry from scratch and convincing actors from the current or from other industries to join the initiative. Making farmers change the industry involves changing the type of hemp being grown as the current-grown hemp's fibers are too short for the textile industry. Regarding the value chain downstream, as fabric manufacturers are not used to working with hemp, they must be convinced of the use of this type of fiber. The cooperative has found a jeans maker to partner with, *Atelier Tuffery,* that distributes the jeans by itself without intermediaries to save costs. It also involved finding new actors along the value chain as the disappearance of the industry decades ago swept away most of its actors. So far, *Virgocoop* has found a weaver capable of weaving imported hemp yarns and supply this fabric to a jean maker. The cooperative also works with a company to transform hemp into fiber, but the process is not convincing enough.

Second, the alternate resource can be perceived as a junk resource because it is currently not used by any industry. For instance, regarding 'forgotten' fishes, as fishermen tend to focus on the most wanted species they can sell at a high price, the value of the remaining, less desired fish species is so low that they are thrown overboard dead when they are caught. It represents in the world almost a fourth of the 90 million tons of fish that brought back to port every year. The entrepreneurs must find mechanisms to encourage actors to valorize this junk resource. *Poiscaille* is paying fishermen at a fixed price on average 20% better than the market. For instance, in mid-March 2019, while the Spanish mackerels (a specific species of mackerels) were sold to the auction houses at a very low price of 6 cents per fish, *Poiscaille* bought it 4 euros directly from its fishermen partners. As there is no contractual relationship between the

fishermen and *Poiscaille*, the start-up bets on the attractiveness and on the stability of its buying price. For instance, during the covid-19 crisis, most fishermen had no output as all French restaurants were closed. *Poiscaille* could over them a market opportunity at a fixed price way higher than the prices at the auction houses that were anyway mostly closed according to *Poiscaille* newsletter sent on April 20th 2020.

Gathering skills and technical resources

To offer new values to its consumers, organizations from our four cases have innovated and developed new capabilities. For instance, the *Slow Flower Movement* looked for innovative ways to offer flowers the whole year; the wool and hemp initiatives investigated how to turn the threads into fabric, and *Poiscaille* developed an attractive alternative to traditional fishing shops. These innovations concern technical resources as well of value chain reconfiguration.

Entrepreneurs combined resources to solve technical issues often due to the fact the industry no longer exists, making tools and 'savoir-faire' disappear. It led to different experimentations. For instance, the association of organic flax and hemp (LCBio) first believed that it could take advantage of the experience of the flax sector to develop hemp for cultivation, and developed different tests based on the flax experience. However, it finally renounced, finding that synergies are limited despite the similarities between the two plants, as is the case for harvesting machines that are not always compatible between the two plants. Another lost 'savoir-faire' relates to the transformation of fibers into yarn, the retting operation that used to be polluting, for which *La Chanvrière*, the first hemp processing cooperative, develops research and development.

Beyond technical skills, entrepreneurs must find new ways of doing business to deliver a proper value to customers by reconfiguring the value chain. To construct a sustainable competitive advantage based on 'forgotten' fishes, *Poiscaille* had to innovate and developed new capabilities. It innovated the supply chain of the fishing industry to get fishes distributed within 48 hours and develop a competitive advantage in comparison to the majority of fish shops supplied by the market of Rungis (the biggest fresh market in the world). Thanks to its direct relationship with fishermen, *Poiscaille* knows the catch of the day and by relying on a software that has been internally developed, it puts through the offer with the demand directly to customers. As *Poiscaille* by-passes the auction houses, fishes are directly shipped to a storage area located in the Parisian suburb. During the night, employees allocate them to each customer and ship the fishes the day after to the distributors, either by themselves or by relying on La Poste (in that case, with an extra-day). Second it innovated its business model

by relying on subscriptions. As consumers subscribe to fish on a weekly, two-week or monthly basis, the start-up can forecast the fish that it needs and thus guarantees the perfect match between supply and demand.

A small-scale initiative

In each of our cases, entrepreneurs work at a small scale. *Poiscaille* focuses its activity mainly in the Paris region, providing around 3,500 subscribers, *the Slow Flower Movement* started in the USA, *Tricolor project* aims to construct a French industry and regarding hemp, several local initiatives have bloomed in France at a regional level. While the small size of the initiatives can be explained by the early stage of their development, it is also explained because it is part of the philosophy of these projects as entrepreneurs believe that sustainability partly comes from keeping the initiatives local. As *The Slow Flower Movement* is now a worldwide movement that operates in the USA, Australia and some countries in Europe, it offers a good illustration of how it remained local. In fact, despite a high diffusion through numerous books, worldwide conferences, etc., each country initiative follows the manifesto (see subsection 'making specifications'). In this case, scaling up means multiplying small-scale initiatives based on the same local concept. Synergies are, however, found at the global level regarding how the value of the resource has been reshaped.

5. DISCUSSION AND CONCLUSION

Building on four cases where initiatives have developed to deliver sustainable services based on natural resources, we found that it relied on resources whose value has evolved depending on the context, and that it involved reshaping the value of the resource and reconstructing an industry. We discuss these findings in turn.

5.1. MANAGING NATURAL RESOURCES FROM A STRATEGY PERSPECTIVE

As the literature on resources is anchored in a paradigm that values rare resources and thus encourages resource exhaustion (Barney, 1991; George et al., 2015), it does not offer a satisfying response to the sustainable management of natural resources. Thus, relying on the literatures on commons and on the Anthropocene, we built on a multiple case study to understand how organizations can develop a governance system offering pragmatic solutions and concrete actions to combine their resources in order to manage their resources. Our four

cases demonstrate that such natural-resource management relies on reshaping the value of the resources and on reconstructing an industry. On the one hand, organizations need to prove that there exists a way to manage resources in a sustainable way that would be profitable, and on the other hand, they need to reconstruct a network of actors first at a local scale to produce the good or the service as the resources necessitates new skills to be combined with new resources. It offers interesting implications to natural-resource management.

The mechanisms we uncovered are close to mechanisms found in the industry emergence. In fact, the literature shows that grand challenges can act as a trigger to activate and provoke the emergence of new industries (Agarwal & Hoetker, 2007), as has been the case with the windmill industry that has been triggered by the threat of energy shortage and pollution due to fossil energy overconsumption (Sine & Lee, 2009). We similarly found that a change of resources led to the development of different initiatives relying on reconstructing new industries. We also found that the emergence based on the recombination of resources for sustainability purposes relies on mechanisms found in re-emerging industries. For instance, Hatch & Schultz (2017) show that history can be mobilized throughout the re-emergence of an industry, which is something that is also shown in our cases as all the resources were well established in previous contexts. Similarly, Raffaelli (2018) describes a mechanism where a discarded resource value is reinvigorated by creating a shift in meaning, which is a mechanism similar to the one found in our cases. Thus, the question remains whether these initiatives lead to new industries, co-evolving paradigm within single industries or new strategic groups. While industry emergence is a long process that makes this question difficult to answer, there is no real shift in consumption from rare resources to context-dependent resources. Thus, we argue that the different initiatives we have uncovered are currently at their incubation stage (Agarwal et al., 2017), as public authorities have not yet encouraged such shift. In fact, scaling up is an important subject when it comes to social innovation (Westley et al., 2014).

5.2. REEVALUATING NATURAL RESOURCES IN THE CSR DEBATE

In this article we came up with three attributes for natural resources – context dependence, finitude, and uniqueness – that integrate the CSR imperative and are actionable from a strategic standpoint. Studying initiatives that adopt this new perspective on resource management improved our understanding of the stakes and consequences of natural-resource management and in turn deeply questions its theoretical assumptions. For instance, Hart's

(1995) perspective on natural-resource management conducts to optimize current industries without questioning their foundations and to what extent these foundations were responsible for resource exhaustion (see also Hart & Dowell, 2011; Porter & Van der Linde, 1995). We argue that contrary to such conceptualization, sustainability involves rethinking the grounding of the strategy of the firm, i.e. its resources (Barney, 1986), in order to achieve a truly sustainable business (Dyllick & Muff, 2015, pp. 165–166). More generally speaking, we call for a fostered dialog between CSR and strategy in order to put the sustainability issue at the agenda of the organization.

5.3. SUSTAINABLE ENTREPRENEURS AT THE CORE OF THE NATURAL-RESOURCE MANAGEMENT

While the literature we reviewed put the emphasis on alternative organizations such as NGOs and social movements (Wright, 2018), public-private collaboration (Agarwal et al., 2017; Gasbarro et al., 2016), or civil society organizations (e.g., McDermott et al., 2017; Meyer & Hudon, 2017), all the initiatives we uncovered did not put the emphasis on any of these actors but rather on sustainable entrepreneurs. While they are shown to be confronted with the paradoxical injunction (Soderstrom & Heinze, 2019), we argue that they are the only ones who can develop such initiatives. We also showed that their legitimacy resides in solving the paradox in which they are anchored: being both profitable and sustainable. If no other actor is involved in our different cases, it may be due to the fact that they involve both reshaping the value of the resources and reconstructing an industry that can only be carried out by entrepreneurs. Interestingly, none of the sustainable entrepreneurs were previously directly involved in the industry. This raises questions regarding the potential necessity of adopting an outsider position to direct such disruptive change.

5.4. POLITICAL IMPLICATIONS

We believe that this article offers some political implications as we think that the shift to a more ecocentric perspective could be politically accompanied. This article allowed us to identify certain key actors that triggered changes. First these cases showed that individual entrepreneurs as *Poiscaille* and *Virgocoop*, can, at their own scale, initiate value chain transformations. As they hold a central position in the value chain, they have a deep understanding of it and of what can be done to rebuild it. As such, they prove to be good ambassadors to promote change. We also highlighted federations as originators of changes, as

in the Hemp and Wool cases. They have a holistic view of the industry and bound all actors together. Individual entrepreneurs and federations, because of their unique position makes good institutional entrepreneurs capable of triggering change inside the whole industry. We think that supporting sustainable development initiatives rests on accompanying such actors.

As our research underlines that sustainable initiatives conduct to a complete reorganization of the industries, governments should design public aids aimed at reconstructing industries instead of pushing for total quality management way of thinking (e.g., Porter & Van der Linde, 1995). It would help convince actors to move beyond mere resource optimization and waste limitations to adopt more radical solutions (see George et al., 2015).

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