

## Improving corporate biodiversity management through employee involvement

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### Abstract

This paper presents an empirical examination of the role of employee involvement in the internalization of corporate biodiversity management. A qualitative study in natural resource companies was conducted, based on semi-directive interviews with managers, consultants, and experts in this area. The findings show that employee involvement is essential to improve biodiversity practices in natural resource companies, which largely rely on organizational citizenship behaviors for the environment. The role of tacit knowledge, voluntary initiatives, and prevention of harmful behaviors in the workplace are highlighted. The main obstacles to the internalization of biodiversity issues include their complexity, the lack of corporate commitment, the externalization of initiatives, and the lack of training for employees. The contributions to the literature on corporate environmental management, internalization of new practices, and organizational citizenship behaviors for the environment are explained. Managerial implications and avenues for future research are also provided.

**Keywords:** corporate biodiversity management, employee commitment, natural conservation, natural resource companies, OCBs, pollution prevention

## 1 INTRODUCTION

Biodiversity conservation is increasingly considered to be one of the most important sustainability challenges (Bonini & Oppenheim, 2010; Jones & Solomon, 2013; Raymond et al., 2013; SCBD, 2010). Various ecological services on which industrial societies depend, including the provision of food, plant pollination, medicinal and genetic resources, recreation, and tourism, rely on the preservation of biodiversity and natural habitats, which are threatened by human activities (Dittmar, 2014; Howard, 2016; Newbold et al., 2016).

The severity and impacts of biodiversity loss have been the object of many studies that have helped to inform decision makers and public opinion on this issue. For example, in 2017, a notice signed by more than 15,000 scientists from 184 countries stressed the “trend of collapsing biodiversity” and the need to “take immediate action as a moral imperative to current and future generations” (Ripple et al., 2017, p. 1026). To address this imperative and the related institutional pressures,

some international institutions have launched programs for biodiversity conservation. Nevertheless, the role of companies in biodiversity issues—particularly in the natural resource sector where companies have a huge impact on biodiversity (Bonini & Oppenheim, 2010; Jones & Solomon, 2013)—and measures taken by companies to improve their performance have been largely overlooked in the literature. More specifically, how biodiversity is managed inside organizations and the role of employee involvement in the reduction of biodiversity impacts have not been the object of substantial studies.

This paper investigates the role of employee involvement in the management and internalization of biodiversity issues in natural resource companies<sup>1</sup> through an empirical study of managers and experts involved in this area. The remainder of the paper is organized as follows. First, the literature on biodiversity practices and on the importance of employee commitment in environmental management is described. Second, the qualitative method used in this study is explained. Third, the results are structured around three major themes: the drivers of the internalization of biodiversity, the importance of discretionary initiatives for biodiversity in the workplace, and the obstacles to employee commitment. Section 5 highlights the main contributions, practical implications, and avenues for future research.

## **2 MANAGING BIODIVERSITY THROUGH EMPLOYEE INVOLVEMENT**

### *2.1 Promoting biodiversity practices*

Corporate activities, and human societies in general, depend on various ecological services provided by healthy ecosystems, and the preservation of the biological diversity of those ecosystems is increasingly seen as one of the main challenges to sustainability (Balmford et al., 2002; Bonini & Oppenheim, 2010; Heller & Zavaleta, 2009; Jones & Solomon, 2013; Raymond et al., 2013; SCBD, 2010).

Recent and widely publicized reports have alerted decision makers and public opinion to the urgent need to halt the rapid decline of biodiversity for environmental as well as economic, social, and ethical reasons (Ripple et al., 2017). According to a study based on 2,382,624 records on ecological diversity worldwide, two thirds of vertebrates that were thriving in 1970, including many species of mammals, birds, and fish, could disappear by 2020 (Dittmar, 2014; Howard, 2016; Newbold et al., 2016). The alarming rate of biodiversity decline in many regions has increased social pressures on companies, particularly those involved in the exploitation of natural resources such as the mining, energy, and forestry (Jones & Solomon, 2013; Kitula, 2006; van Liempd & Busch, 2013; Winn & Pogutz, 2013; Wishart, 2012). Those pressures emanate from various stakeholders, including NGOs, international institutions, environmental agencies, and the local population. For example, Greenpeace launched the Golden Chainsaw Award, given to decision makers who have played a major role in the destruction of native forests, causing biodiversity loss. Various indicators and targets focused on biodiversity and intended to encourage corporate commitment have also been introduced (e.g., the Sustainable Development Agenda adopted in 2015 by the UN).

To ensure the social license to operate and the sustainability of their activity, organizations are increasingly required to promote biodiversity (Boiral, 2016; Jones & Solomon, 2013; Winn &

Pogutz, 2013). How practices to promote biodiversity are implemented by organizations has not been studied adequately. Most studies focus on specific, technical, and context-dependent issues, such as the development of protected areas, the implementation of conservation programs, inventories of wildlife species, monitoring biodiversity indicators, or mitigating biodiversity impacts through offsetting and restoration measures (Boiral & Heras-Saizarbitoria, 2017b; D'Amato, Wan, Li, Rekola, & Toppinen, 2016; Schiappacasse, Nahuelhual, Vásquez, & Echeverría, 2012; Virah-Sawmy, Ebeling, & Taplin, 2014; von Haaren, Kempa, Vogel, & Rüter, 2012). Although those studies shed light on critical biodiversity issues and how to respond to specific challenges, they are almost silent on the corporate and managerial implications of biodiversity practices. The lack of organizational research in this area can partly be explained by the technical nature of biodiversity measures and the wide variety of issues, which have been researched from various perspectives including biological conservation, ecology, land-use management, oceanography, and ethology.

## *2.2 Employee commitment and internalization of biodiversity practices*

The importance of employee commitment in the internalization of environmental issues and improvement of environmental performance has been highlighted in many studies (e.g., Anderson & Bateman, 2000; Boiral & Paillé, 2012; Boiral, Paillé, & Raineri, 2015; Ones & Dilchert, 2009, 2012; Smith & O'Sullivan, 2012). Such commitment can take various forms, including recycling, improving energy efficiency, making environmental suggestions, and participating in environmental committees. Internalization and employee commitment have been associated with various organizational benefits, such as the success of pollution prevention programs and cleaner production procedures (e.g., Bhupendra & Sangle, 2015; Remmen & Lorentzen, 2000). Similarly, employee commitment can lead to environmental innovations and the development of specific organizational capabilities that improve corporate competitiveness (Boiral, 2002; Hart, 1995; Ramus & Killmer, 2007). But, the specific nature and scope of employee commitment to the environment are rarely specified, and certain issues, including biodiversity initiatives, are overlooked. One of the key characteristics of employee commitment is that it is voluntary (Boiral & Paillé, 2012; Lülfs & Hahn, 2013; Norton, Parker, Zacher, & Ashkanasy, 2015). Although environmental management systems such as ISO 14001 focus on mandatory programs and procedures, various studies have shown the importance of discretionary initiatives for the environment in the workplace (Boiral & Paillé, 2012).

Those initiatives are generally associated with organizational citizenship behaviors for the environment (OCBEs), which can be defined as voluntary behaviors not explicitly rewarded or recognized by the organization that contribute to the effectiveness of environmental practices (Boiral, 2009; Ramus & Killmer, 2007). These individual, voluntary, and extrarole behaviors include different types of initiatives, such as sharing knowledge to prevent pollution in the workplace, suggesting solutions aimed at reducing waste, representing the organization at an environmental conference, and collaborating with the environmental department to implement green technology (Boiral & Paillé, 2012). OCBEs are an umbrella concept covering a large variety of proenvironmental behaviors not explicitly taken into account by formal environmental management systems. The translation of OCBEs into specific initiatives for the environment, particularly for biodiversity conservation, is still to be studied.

Although the role of employee commitment in the internalization of biodiversity practices and improvement of performance has been overlooked in the literature, it is important for at least three, nonmutually exclusive reasons: the lack or absence of formalized management systems for biodiversity, the need for substantial rather than symbolic biodiversity practices, and the tacit knowledge of fieldworkers. First, biodiversity issues are relatively new for many managers, and corporate programs for nature conservation are still quite limited (Boiral, 2016; Boiral & Heras-Saizarbitoria, 2017a; Bonini & Oppenheim, 2010; Jones & Solomon, 2013; Rimmel & Jonäll, 2013; van Liempd & Busch, 2013; Winn & Pogutz, 2013). Certifiable standards to implement Environmental Management Systems such as ISO 14001 and EMAS have been developed over the last decade (Boiral & Gendron, 2011; Chiarini, 2017; Heras-Saizarbitoria, Arana, & Boiral, 2015; Russo, 2009; Yin & Schmeidler, 2009) and focus on general management principles applicable to almost any organization rather than on specific environmental measures, including those for biodiversity.<sup>2</sup> More specific standards for corporate biodiversity management have recently been launched by various institutions and nature conservation organizations (Boiral, Heras-Saizarbitoria, & Brotherton, 2018). The focus of those standards is technical, and their adoption concerns a limited number of organizations. The lack of integration of biodiversity into current environmental management standards does not encourage the formalization of programs and procedures inside organizations. As a result, employee involvement for biodiversity remains poorly covered or rewarded by existing formal management systems and, therefore, depends on OCBEs rather than prescribed tasks.

Second, many studies have shown that the substantial adoption of environmental practices depends on the involvement of employees, especially OCBEs (Boiral et al., 2015; Paillé, Boiral, & Chen, 2013; Paillé, Chen, Boiral, & Jin, 2014) and environmentally friendly workplaces (Saifulina & Carballo-Penela, 2017). The success of environmental management systems depends, to a large extent, on employee commitment (Aravind & Christmann, 2011; Boiral, 2011; Heras-Saizarbitoria, Arana Landín, & Molina-Azorín, 2011; Qi, Zeng, Li, & Tam, 2012; Yin & Schmeidler, 2009). In the absence of such commitment, environmental practices tend to remain symbolic, superficial, and not internalized into daily activities (Aravind & Christmann, 2011; Boiral, 2007; Iatridis & Kesidou, 2016). The lack of connection between the discourse on environmental issues and actual practice has been demonstrated in various studies based on legitimacy theory (Boiral, Guillaumie, Heras-Saizarbitoria, & Tayo Tene, 2018; Heras-Saizarbitoria & Boiral, 2013; Iatridis & Kesidou, 2016; Yin & Schmeidler, 2009). According to this theory, the environmental commitment of organizations tends to be driven by external pressures and the search for social legitimacy rather than improvement of internal practices and performance. As a result, the implementation of environmental practices is often symbolic and does not result in significant improvement of performance. The complexity of biodiversity initiatives, their lack of visibility, and difficulty in measuring progress (Boiral, 2016; Winn & Pogutz, 2013) may encourage symbolic rather than substantial initiatives. In the absence of significant employee commitment, the response of organizations to institutional pressure for biodiversity is mostly superficial and based on rhetorical statements or external actions (e.g., donations, sponsorship, and education of the local population) intended to improve corporate image rather than internal practices.

Third, OCBEs are essential to share relevant tacit knowledge on biodiversity issues and implement concrete initiatives. The literature on environmental management reports the importance of tacit

knowledge (i.e., personal, action-oriented, and difficult to codify knowledge; e.g., Boiral, 2002; Hart, 1995). The relevance of such knowledge is related to the direct involvement of employees in the processes and activities at the source of contaminant releases. Such involvement tends to develop personal, circumstantial, and implicit knowledge that employees may or may not choose to share, including technical malfunctions, spill monitoring, or identification of pollution sources. This type of knowledge is also useful for the management of biodiversity issues, particularly in natural resource sectors such as the mining, forestry, and energy sectors. In those sectors, fieldworkers—unlike managers and office employees—are in direct contact with the natural environment and can develop tacit knowledge related to local biodiversity. The sharing of this type of knowledge is voluntary and has been associated with OCBEs (Boiral, 2009; Paillé et al., 2014). Similarly, the voluntary initiatives of employees may be essential to the prevention of damage to biodiversity (e.g., leaks of toxic products into the environment and rapid responses to incidents) or identification of endangered species.

Based on the general literature on environmental management, employee commitment and OCBEs play a significant role in the effectiveness of biodiversity management. Nevertheless, how employees can be involved, in practical terms, in biodiversity management, the impact of such involvement, and obstacles to it in organizations remain to be investigated.

### **3 METHODS**

#### *3.1 Data collection*

Considering the gap evidenced in the literature review, the objective of this study is to explore the role of employee involvement in the management and internalization of biodiversity by companies in the field of natural resources. The exploratory nature of the study and the focus on meanings rather than measurement of preestablished variables require a qualitative and inductive approach based on semi-directive interviews (Maxwell, 2012; Punch, 2013).

Because of their impact on biodiversity, this study focuses on natural resource companies, from the forestry, mining, and energy sectors, as well as independent consultants and biodiversity certification providers who interact with those companies. The specific focus on natural resource companies such as the ones from the mining, energy, and forestry sectors is justified by their direct and very relevant impacts on biodiversity (Didham, 2011; Fisher et al., 2011; Wishart, 2012). The adoption of biodiversity practices by organizations belonging to these sectors tends to be driven by external pressures from stakeholders (Boiral, Heras-Saizarbitoria et al., 2018). First, natural resource companies often face criticism and opposition from local people who see industrial activities as a threat to natural ecosystems. The development of mining activities or logging projects, which generally involve the construction of roads, the passage of heavy trucks, and exposure to possible toxic spills, can clearly have an impact on the quality of life of local residents. Second, the integration of biodiversity into environmental practices can be driven by governmental regulation and other requirements. Third, various non-governmental organizations (NGOs) such as the World Wildlife Fund and the Wildlife Habitat Council exert pressure on natural resource companies to adopt biodiversity practices and standards.

The selection of potential respondents was conducted in four stages. First, natural resource companies were selected from the Global Reporting Initiative database, which lists more than 45,000 sustainability reports.<sup>3</sup> Keywords such as biodiversity management, biodiversity standards, and biodiversity impacts were used to identify companies that implemented initiatives in this area. At the end of this first stage, more than 400 reports from relevant companies were identified. Second, when the information was available, environmental managers or biodiversity experts from these companies were contacted by email. This email clearly explained the objectives of the study and the search for respondents with a significant experience of management of environmental and biodiversity issues. Third, semi-structured interviews were conducted with respondents of the selected companies. Interviews covered various issues, including the main challenges of biodiversity management, the development of internal knowledge and expertise, the role of training and communication, and employee commitment. Because of the international activities of most companies and remote locations of many respondents, interviews were mostly conducted by telephone or by Skype. Like many previous studies (Holt, 2010; Stephens, 2007; Sturges & Hanrahan, 2004; Talbot & Boiral, 2013), no significant differences were observed between face-to-face and telephone interviews. Before each interview, respondents signed a research protocol approved by the ethics committee of the (Blind reference) university. This protocol promised the anonymity of respondents and companies. Fourth, in order to extend the number of participants and delve deeper into specific issues, snowball sampling (Miles & Huberman, 1994; Noy, 2008) was also used.

Forty respondents were interviewed and discussed topics included various aspects of employee commitment for corporate biodiversity management. Most interviews were conducted in English and some in French or in Spanish. To facilitate the qualitative analysis of data, all interviews were tape-recorded. Table 1 summarizes the sample composition.

**Table 1.** Sample of respondents

	<b>Status of respondents</b>				<b>Total</b>
	<b>Managers</b>	<b>Auditors and Consultants</b>	<b>Scientists and Researchers</b>	<b>Other Experts</b>	
Private sector	11	3	1	0	15
Public sector	2	1	1	1	5
NGOs	3	1	0	0	4
Certification bodies	0	0	0	4	4
Other*	3	8	1	0	12
<b>Total</b>	<b>19</b>	<b>13</b>	<b>3</b>	<b>5</b>	<b>40</b>

\* Respondents listed in this category were mainly self-employed people working with the private sector. To a lesser extent, some of those were also people involved in an association of multiple companies from the private sector.

### 3.2 Data analysis

Qualitative data analysis was based on grounded theory approach, which provides a general framework for the codification, grouping, and comparison of research evidence (Glaser & Strauss, 2017; Suddaby, 2006). Unlike hypothetico-deductive reasoning, grounded theory focuses on an

analysis grounded in data and on the emergence of recurring themes rather than the validation of predetermined hypotheses. The analysis process followed a five-step approach. First, interviews were transcribed verbatim. Transcriptions occupied 603 single-spaced pages. Second, the transcriptions were transferred to the QDA Miner (Version 4) qualitative analysis software enabling the codification process, analysis of data, and retrieval of relevant passages. Third, a preliminary categorization grid was developed in the QDA Miner software in collaboration with the members of the research team. Fourth, all responses were categorized in the categorization framework. In line with the inductive and iterative approach of grounded theory, the framework was refined and completed throughout the data analysis process. As a result, new categories were created as new themes or concepts emerged. Similarly, some categories were subdivided or grouped, depending on the collected data. To facilitate the interpretation of data and improve the validity of the analysis process, each category was clearly defined and discussed by the research team. Double-blind coding was performed by two independent coders on a quarter of the data. This double codification made it possible to identify potential differences in the interpretation of the categories and to improve the framework. The analyses conducted by the two coders were very similar and did not lead to significant changes in the categorization process. At the end of this process, the categorization framework comprised 59 categories and incorporated 786 passages focusing on the role of employees in biodiversity management. Fifth, the most relevant categories were grouped into three main themes covering the research objectives:

- the main drivers of the internalization of biodiversity inside organizations (e.g., evolution of biodiversity management, role of external pressures, and importance of employee involvement);
- the importance of OCBs related to biodiversity issues (e.g., voluntary initiatives for biodiversity, behaviors with positive or negative impacts on biodiversity, and the role of tacit knowledge); and
- the obstacles to employee commitment and internalization of biodiversity initiatives in the workplace (e.g., lack of internal expertise, dearth of employee training, and complexity of biodiversity issues).

Finally, the most representative and relevant passages related to these three main themes were selected.

## **4 RESULTS**

### *4.1 Adopting biodiversity practices in natural resource organizations*

The concept of social license to operate was spontaneously mentioned by 58% of respondents to stress the importance of improving the social acceptability of corporate operations, implying measures for biodiversity conservation. Those measures appear particularly important when companies are facing pressure from indigenous communities whose culture and way of life depend on complex and sensitive ecosystems that can be affected by industrial activities. The integration of biodiversity into environmental practices driven by nongovernmental requirements such as the ones of the Mining Association of Canada was mentioned by virtually all the respondents from the Canadian mining sector. Similarly, around 55% of respondents mentioned the existence of

standards on biodiversity management such as the European Biodiversity Standard and the Standard on Biodiversity Offsets. With the exception of a few consultants and experts, most respondents knew very little about these tools. Furthermore, 33% of respondents mentioned that the integration of biodiversity issues represents an ethical imperative that must be addressed by managers and that the company adopted a proactive approach in this area.

Whatever the reasons underlying the adoption of biodiversity practices, nearly half of the respondents spontaneously mentioned that biodiversity has become increasingly important for companies as well as for society as a whole:

“We clearly hear more and more about biodiversity. It has been increasingly important over the last 10 years. In the mining sector, it is essential for our social acceptability. If we do nothing to protect biodiversity, our project will not be well received, so there is no choice but to move forward.” (Sustainability manager in the mining sector)

“I think that things are going to change more rapidly for managers, because they are facing increasing pressures from environmental groups and populations to take these issues into account; to better integrate biodiversity into their practices. I think that managers will have to evolve pretty quickly to integrate those issues.” (Consultant in the mining sector)

Nevertheless, despite the increasing pressures, 23% of respondents recognized that the integration of biodiversity issues into daily activities was insufficient or too superficial. This situation was well summarized by one respondent: “The company can have guidelines or policies based on legal or social considerations, but fieldworkers are the ones responsible for the implementation of these guidelines and policies, and conflicts are likely to arise when they are not well-suited to the reality of the field.” Overall, the effectiveness of internal initiatives for biodiversity depends on employee involvement rather than formal management systems. Such involvement represents a major challenge in most organizations concerned by biodiversity practices.

#### *4.2 Managing biodiversity through organizational citizenship behaviors*

According to the interviewees, the importance of voluntary employee initiatives for biodiversity in companies based on the exploitation of natural resources is related to three interdependent factors: the sharing of tacit knowledge on biodiversity issues, the prevention of behaviors that can harm ecosystems, and the development of initiatives contributing to the improvement of biodiversity practices. Those factors relate to the significant role that individual behaviors play in the internalization of biodiversity issues into daily activities.

First, as explained by 64% of respondents, fieldworkers tend to develop relevant personal and circumstantial knowledge related to the ecosystems and biodiversity issues with which they are in direct contact. This tacit knowledge often depends on circumstantial information observed in the field of operations (e.g., sighting of sensitive species in remote areas, observation of the displacement of wildlife near forest exploitation, and identification of accidental spillage on a mining site). Respondents also mentioned that certain employees develop a deeper knowledge of the ecosystems surrounding the activity site due to their past experience, personal training or extraprofessional interests. For example, employees' hunting, fishing, and hiking activities in



natural sites near the company's operational areas and outside working hours can help to develop knowledge of natural habitats and raise employee awareness of biodiversity conservation. Similarly, the recruitment of local residents—including indigenous people—strengthens environmental knowledge and facilitates the implementation of biodiversity measures. Such measures are seen as all the more relevant to employees when they protect the ecosystems where they live and improve their own quality of life. From this perspective, initiatives for biodiversity conservation are citizenship behaviors that transcend organizational borders. Some respondents also mentioned that, to be substantial rather than superficial and symbolic, biodiversity programs must be adapted to the realities of the field and involve employees and knowledge sharing of in this area. Such adaptation relies on tacit knowledge as well as more technical knowledge about natural ecosystems:

“Employees in the field are in contact with the dynamics of the natural environment, so they can see changes and things that need to be mentioned.” (Environmental director in the mining sector)

“Forestry workers are often nature lovers who are very knowledgeable about natural habitats. Sometimes they are even some kind of naturalist.” (Researcher in the forestry sector)

“The folks that are involved at that field level are really passionate about the environment. They are hunters and trappers in the area and they love being outdoors. It's nice to have that presence. Everybody adds some value to the program, and it's not just the ones working in the company from an environmental and regulatory perspective.” (Biodiversity manager in the energy sector)

“In the field, there is a certain level of understanding of biodiversity, especially for things such as species at risk, identifying new species, etc. At every level, field technicians or personnel have a certain understanding of what to look for.” (Environmental scientist involved with various sectors)

Second, approximately half of the respondents mentioned the importance of preventing harmful behaviors that might damage local ecosystems and biodiversity. Those behaviors are generally related to the use and maintenance of heavy machinery and equipment, the release of waste into the natural environment, and the impacts of regular operations on the local fauna. The prevention of behaviors that harm biodiversity remains discretionary, particularly in operations in remote areas where it is more difficult to control operations. Because of their negative impacts, such behaviors are rarely explicitly recognized by respondents, but they seem to be quite frequently observed in activities taking place near or within natural habitats, and they require awareness-raising measures:

“I had worked before in an industrial forestry company in Northern Canada, and there were people there who still doubted that changing their motor oil near a stream bank was not a good idea!” (Researcher in the forestry sector)

“When you see a truck with an oil leak, you should warn the driver, find paper towels or vermiculite, and call the environmental staff to limit the impacts.” (Sustainability manager in the mining sector)

Third, 43% of respondents mentioned the importance of employee involvement in various organizational or individual initiatives for biodiversity. Those initiatives can be related to structured environmental programs implemented by organizations such as planting operations, control of invasive species, development of ecological corridors, or wetland restoration. Most examples provided by respondents with respect to employee initiatives for biodiversity were related to voluntary, informal, and unrewarded behaviors such as the signaling of rare or endangered species, building bird houses, contributing to the inventory of local fauna and flora, volunteering for cleaning operations, or suggesting ways to reduce the impacts of certain activities on natural habitats. Some of these behaviors were performed outside the organization or in their own time. Corporate programs and internal procedures appear insufficient to cover all the possible or desirable initiatives for biodiversity. As a result, managers rely on voluntary employee involvement in the field for the development of new initiatives, the adoption of responsible behaviors and, more generally, the improvement of biodiversity performance:

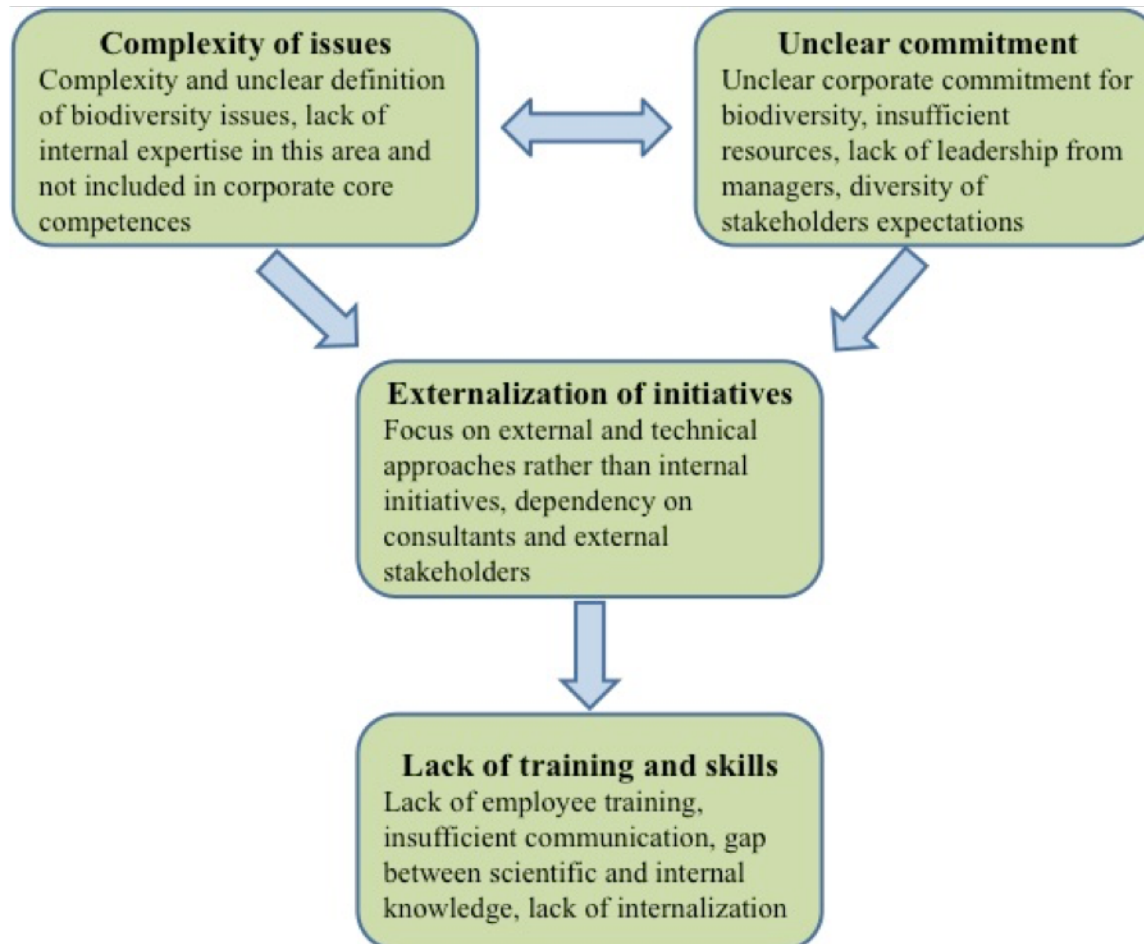
“The fact is that employees are the people in the field on a daily basis. So they face directly the problems and opportunities related to biodiversity, including in areas where we know that endangered species are present.” (Independent sustainability consultant)

“Employees get involved in different ways. Some employees have mapping skills and maybe they will share those mapping skills to collect GPS points on birds' nest locations. Some employees are interested in photography and they may do an inventory of species by taking pictures and cataloguing those, and so on.” (Environmental manager in the energy sector)

#### *4.3 Overcoming the obstacles to the internalization of biodiversity issues*

Although the importance of employee involvement for the improvement of biodiversity practices was stressed by respondents, such involvement is not automatic and cannot be taken for granted. Four main obstacles to the internalization of biodiversity practices and employee involvement were highlighted: the complexity of biodiversity issues and lack of organizational knowledge, the unclear organizational commitment for biodiversity, the focus on external and technical approaches, and the lack of available training for employees. Those obstacles are not mutually exclusive but are interrelated and tend to reinforce each other (see Figure 1).

**Figure 1.** Main obstacles to the internalization of biodiversity issues



First, the complexity of biodiversity conservation and the lack of organizational knowledge in this area undermine internalization. Around 65% of respondents mentioned that biodiversity conservation and its implications for environmental management remain poorly understood by most managers and employees. For many organizations, the concept of biodiversity is relatively new, and when specific issues are identified, the organization does not necessarily know how to respond, including in terms of employee involvement. As a result, the internalization of efficient biodiversity practices and the development of employee initiatives require a complex and lengthy learning process that remains in its infancy in most organizations:

“Currently, I do not think that we can see significant changes as the concept of biodiversity remains vague for employees and managers. They can associate biodiversity to fauna or flora in general, but beyond that, what does that mean exactly? What does biodiversity management imply in practical terms? How can I contribute to biodiversity protection or conservation? People do not have clear answers for those as biodiversity is a relatively new concept in the mining sector.” (Environmental director in the mining sector)

“During a biodiversity study, a consultant may identify a rare species, but so what? The company does not necessarily know what to do about it and what the next steps are. Alright then, we have identified this particular species, but how far must we go now? I do not think

we have the necessary expertise on biodiversity management to deal with this kind of issue.” (Environmental director in the mining sector)

“It is far from our core business. Our mission is to produce aluminum. Our internal expertise in terms of biodiversity management is very limited and I think this is our biggest challenge in this area.” (Consultant in the mining sector)

Second, although biodiversity issues tend to be increasingly important, objectives and priorities are rarely clearly defined, which does not encourage the adoption of new practices for nature conservation and employee commitment. Nearly 55% of respondents highlighted the lack of clear priorities and organizational measures to manage biodiversity effectively. This weakness relates partly to the lack of internal expertise and understanding of biodiversity of managers who tend to overlook or neglect this issue (see Figure 1). But, it is also fuelled by more fundamental obstacles, particularly the cost of biodiversity measures and lack of leadership. Biodiversity conservation may require important and costly organizational changes (i.e., implementation of offsetting programs, reduction or relocation of activities, and development of training plans) that organizations are reluctant to implement, particularly in SMEs with limited resources. Some managers also believe, rightly or wrongly, that their organization is complying with regulations and that, therefore, it is not necessary to prioritize this aspect or to define specific objectives. External pressures and requirements for biodiversity, including those from government agencies, are rarely very specific and can come from stakeholders with different requirements or expectations. As a result, the organizational response is not necessarily substantial and based on the internalization of biodiversity concerns by employees. Rather, initiatives for biodiversity tend to be subsumed under more general and nonspecific environmental actions intended to improve organizational legitimacy in the eyes of external stakeholders:

“Honestly, smaller companies have fewer resources and rarely have specific commitments to biodiversity. They may have environmental commitments and may perform some impact studies. They may put in place mitigation and monitoring measures to meet regulatory requirements, but they do not necessarily have something specific for biodiversity. However, when companies implement actions to limit their environmental impacts, this is also good for biodiversity.” (Sustainability manager in the mining sector)

“One of the main obstacles is the fact that, from project to project, group to group, stakeholder to stakeholder, defining biodiversity and the importance of that is not consistent. So, you have to do it at each level, you have to redefine what biodiversity is, and what are important components that you need to protect.” (Environmental scientist involved with various sectors)

“Government's expectations for biodiversity are not necessarily clear to us. Ethically, we want to make sure that what we do is appropriate, but it's also obviously a huge financial commitment. So you want to do what is fair across components and industry, but also make sure that it's appropriate to the impacts.” (Environmental manager in the mining sector)

Third, the lack of internalization of biodiversity issues is related to the focus on external rather than internal approaches. An external focus was mentioned by approximately half the respondents.

Lack of internal knowledge on biodiversity and unclear priorities encourage organizations to externalize the management of biodiversity through initiatives in partnership with various stakeholders (see Figure 1). Those initiatives can be focused on technical aspects (i.e., implementation of wildlife corridors in collaboration with conservation NGOs, participation in the development of protected areas, and surveys of rare or threatened species with experts from the government) or managerial actions (i.e., consultation with stakeholders, sponsorship of conservation program, and implementation of biodiversity awareness programs for local population). Whatever their nature, external initiatives for biodiversity do not generally require the development of internal competences and can make corporate initiatives more visible. They also improve relationships with stakeholders concerned with conservation. Although it can strengthen organizational commitment to nature conservation, the focus on external actions increases dependency on external stakeholders and does not encourage the development of internal capabilities to reduce the impacts of daily activities on biodiversity. As a result, biodiversity conservation is seen as an external concern, which hardly influences internal practices:

“There are very few companies that are really able to manage biodiversity internally. Most companies do not have biodiversity managers, so they call in an outside consultant to do the job.” (Manager in a certification body)

“There's a whole bunch of NGOs working in this area now and willing to engage with the private sector to help them build that capacity, working in partnership with them, developing training courses, ecosystem services, as well as biodiversity management. But people who can understand the complexities of business, who understand the complexities of biodiversity and who are able to bring those two together in a convincing way are still relatively few in number.” (Independent sustainability consultant)

“Without the help of universities and governments, companies would be unable to meet the standards and requirements on biodiversity. No one in a company is capable of doing this, they do not have the skills and knowledge to do it; it's out of the box.” (Auditor in the forestry sector)

Fourth, as mentioned by 13% of respondents, the internalization of biodiversity practices is hampered by the lack of employee training and insufficient communication on precisely what is expected from them. This issue is partly related to the complexity of biodiversity issues, the lack of clear organizational commitment, and the focus on external approaches (see Figure 1). Although employees may develop relevant tacit knowledge to improve biodiversity management, they are not necessarily well informed on the importance of that knowledge and how to use it appropriately in practical terms. In the absence of sufficient organizational support, training, and procedures, employee commitment remains theoretical and inefficient. Even if certain environmental departments have developed specific expertise on biodiversity, such expertise can be very technical and difficult to translate into appropriate skills and actionable knowledge for fieldworkers. The gap between the scientific knowledge required to manage biodiversity better and the basic training of employees in direct contact with natural ecosystems undermines the internalization of good practices in this area:

“I am talking about scientists involved with biodiversity: we still have a lot of work to do to disseminate what we are doing and make it understandable by everyone. We need to do so to involve workers in industries. I have worked in ecological services and, really, when I talked about that, people looked at me as if they did not know what I was talking about. They thought I was pretty esoteric. There is a growing gap between the general public and the science on biodiversity.” (Independent consultant in the mining sector)

“In general, organizations do not have the training and expertise to achieve biodiversity. Some companies do have research and development departments, but the general employee does not have the required expertise or the company does not have that expertise to put forward to the employee.” (Environmental manager in the energy sector)

“We have environmental awareness training but I think that, definitively, we could do a better job in this area.” (Environmental manager in the mining sector)

## **5 DISCUSSION AND CONCLUSIONS**

The objective of this study was to analyze the importance of employee involvement in the management of biodiversity in natural resource companies based on a qualitative study among managers and experts involved in this area. This study shows that despite the technical nature of many issues related to nature conservation, employee involvement plays a critical role in the internalization of biodiversity by organizations. Such involvement largely depends on voluntary initiatives or OCBs. Those initiatives are associated with the tacit knowledge of employees in direct contact with the ecosystems that may be affected by corporate activities, the importance of preventing harmful behaviors related to daily activities, particularly the use and maintenance of equipment, and the lack of structured programs and procedures that reinforces the role of voluntary behaviors in the workplace. Nevertheless, in most organizations, employee behaviors for biodiversity conservation are relatively underdeveloped for reasons related to the inherent complexity of biodiversity issues and some organizational deficiencies, particularly lack of clarity in corporate commitment, the externalization of initiatives, and a shortage of employee training and skills.

This paper contributes to the literature in three complementary ways. First, the paper contributes to the general literature on corporate environmental management by shedding light on the underexplored issue of biodiversity management. Most studies on biodiversity conservation are rather technical and focus on specific issues. Conversely, the literature on corporate environmental management is quite general and subsumes a large variety of issues under the umbrella concept of the environment (e.g., greenhouse gas [GHG] emissions, waste management, water contamination, stakeholder relationships, prevention of accidental spill, and biodiversity conservation) that may require very different approaches. As a result, the management of biodiversity in organizations, particularly in terms of employee involvement, has been overlooked. Although the importance of employee voluntary behaviors is highlighted in the general literature on environmental management, most research in this area is nonspecific. The results of the study shed light on the reasons why such behaviors play an essential role in the specific context of biodiversity management in natural resource companies. Second, the paper contributes to the literature on the

internalization of environmental issues. This literature focuses on legitimacy theory and the corporate response to external pressures (e.g., Iatridis & Kesidou, 2016). Previous research has focused on general management systems, especially the ISO 14001 standard. As a result, the practical improvement of internalization of specific environmental issues such as biodiversity conservation needs to be investigated further. This study addresses this gap in the literature by showing why and how OCBEs can improve the internalization of biodiversity in natural resource companies. Third, the paper contributes to the literature on OCBEs and the role of employees in corporate environmental management in general. Most studies on OCBEs are based on quantitative approaches in which environmental behaviors are measured through general measurement scales or narrowly focused office behaviors, such as recycling, turning off lights, or double-sided printing (e.g., Lamm, Tosti-Kharas, & Williams, 2013; Paillé et al., 2014). Those behaviors are not necessarily representative of the most substantial environmental issues for organizations, especially in industrial and natural resource sectors such as mining or forestry. As a result, the concept of OCBEs tends to remain relatively abstract for many managers, and its measurement is not necessarily in line with the concrete issues that need to be addressed through employee involvement. This paper broadens the scope of the literature on OCBEs and sheds light on concrete behaviors that can have a significant impact on nature conservation. The empirical study also contributes to the literature on the *raison d'être* of voluntary employee behaviors and addresses the need to further investigate the obstacles to their emergence inside organizations (Norton et al., 2015).

The conclusions drawn in this article are exploratory, as the fieldwork has been based on a qualitative methodology. Then, the limitations to the generalization of these conclusions have to be considered. More research is needed to explore the role of employee involvement in the internalization of corporate biodiversity management. Many different aspects that may alter the findings should be analyzed by further research using both qualitative and quantitative methodologies. Among many other issues, further research should shed light on the cultural and institutional factors that may affect the role of employee involvement.

This study has managerial implications for organizations concerned with biodiversity management. By highlighting the importance of employee involvement for improving biodiversity performance and the organizational barriers to such involvement, the findings lead to some recommendations. First, organizations need to clarify their commitment, objectives, and procedures for biodiversity management. The importance of OCBEs for biodiversity observed in this study is partly due to the lack of formal management systems. Although OCBEs, such as the sharing of tacit knowledge on natural ecosystems, are relevant whatever the management system used, the promotion of biodiversity conservation should not rely mainly on discretionary initiatives. The reliance of many companies, as well as society as a whole, on the conservation of natural resources, the increasing pressures in this area and the need to maintain organizations' social license to operate require the implementation of more formal, structured, and substantial practices for biodiversity. The development of specific certifiable standards may help organizations that are struggling with major biodiversity issues.

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## **ENDNOTES**

1 That is, extractive companies operating in the natural resource sector, in activities such as forestry and mining.

2 In the case of EMAS III, a set of core performance indicators with one indicator dedicated to biodiversity was included.

3 See <http://database.globalreporting.org/> (consulted on November 26, 2017)



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