Managing biodiversity through stakeholder involvement: Why, who, and for what initiatives?

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Abstract

The increasing pressures to conserve biodiversity—particularly for industries based on the exploitation of natural resources—have reinforced the need to implement specific measures in this area. Corporate commitment to preserving biodiversity is increasingly scrutinized by stakeholders and now represents an important aspect of business ethics. Although stakeholder involvement is often essential to the management of biodiversity, very few studies in the literature have focused on the details of this involvement. The objective of this paper is to analyze how mining and forestry companies can manage biodiversity issues through stakeholder involvement based on a content analysis of 430 sustainability reports using the Global Reporting Initiative (GRI) framework. The paper elucidates the reasons for such involvement, the nature of stakeholders involved, and the types of measures employed to manage biodiversity. Stakeholders' motives for becoming involved revolve around four main issues: complexity and knowledge management; self-regulation and relationships with public authorities; legitimacy and social responsiveness; and commercial and strategic objectives. The stakeholders involved in biodiversity initiatives are essentially non-governmental organizations, experts and universities, public authorities, and coalitions of companies. In the end, the initiatives identified can be grouped into three categories: management practices, socio-political actions, and research and conservation measures. The paper provides various examples of these initiatives and shows how they can be implemented in collaboration with different stakeholders depending on the company's objectives. The contributions the study makes to the literature on biodiversity management and the managerial implications of the study are analyzed in the discussion section.

Keywords: Biodiversity management · Forestry · Inter-organizational collaboration · Mining · Stakeholder theory · Sustainability

Introduction

Conservation of biodiversity is increasingly considered to be a critical component of sustainability (SCBD 2010; GRI 2007; Jones and Solomon 2013). The alarming number of species rendered extinct or endangered raises more than just ethical concerns. Biodiversity loss, particularly at its current rate, also has wide-ranging environmental and socio-economic impacts on food security, ecological services, the health of human populations, and the survival of other

species (SCBD 2010; Butchart et al. 2010). The gravity of these impacts calls for active measures to manage biodiversity, especially by companies that work with natural resources, whose operations can have significant and direct impacts on ecosystems inhabited by at-risk species. This is the case of many mining and forestry companies operating in areas of rich biodiversity where the survival of several species is threatened by habitat loss (Schwartzman and Zimmerman 2005; ICMM 2006; Zimmerman et al. 2001). For these companies, biodiversity protection represents an essential aspect of corporate sustainability. Because of their complexity, socially sensitive nature, and implications that transcend organizational boundaries, measures for biodiversity protection can rarely be undertaken by companies alone and often require the involvement of various stakeholders including local communities, non-governmental organizations (NGOs), and public authorities. The specific motivations underlying the involvement of other stakeholders, the stakeholders engaged, and the actions implemented have yet to be studied in depth.

The objective of this paper is to analyze how mining and forestry companies can manage biodiversity issues through stakeholder involvement. Based on a content analysis of GRI[1] sustainability reports from mining and forestry companies, this paper provides answers to three important questions related to the management of biodiversity issues:

- Why do companies consider involving stakeholders?
- Who is involved?
- What types of initiatives are implemented in collaboration with stakeholders?

These questions are inextricably linked and can hardly be analyzed in isolation. The motivations for biodiversity management through stakeholder involvement determine, to a large extent, who will be involved and for what type of initiative. The answers to these interdependent questions are not only of academic interest. They also raise important ethical issues and are crucial to businesses for at least three reasons. First, the impact of human activities on biodiversity loss is one of the main issues of sustainable development and the protection of natural habitats is increasingly considered to be an ethical imperative for decision-makers, especially in natural resource-based economic activities (e.g., SCBD 2010; GRI 2007; Bonini and Oppenheim 2010). The moral intensity of biodiversity issues (Jones 1991; Chieh-Wen and Ming-Chia 2011) requires companies to demonstrate their commitment in this area to stakeholders and to disclose more specific information on the measures implemented (Jones and Solomon 2013; Rimmel and Jonäll 2013; VanLiempd and Busch 2013). Second, institutional pressures to protect biodiversity have increased over the last few years (Jones and Solomon 2013; SCBD 2010). According to a survey of 1043 managers, more than 50 % of respondents consider biodiversity to be important for building, maintaining, or improving corporate reputation (Bonini and Oppenheim 2010). As stressed by theories of neo-institutionalism, external pressures and the search for corporate legitimacy are two of the main reasons for implementing new practices, especially in the area of environmental management (Meyer and Rowan 1977; Townley 2002; Sarkis et al. 2010; Boiral 2007). Managing biodiversity through stakeholder involvement can therefore reinforce corporate legitimacy and limit external pressures, especially for companies whose earnings derive from the

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[1] The global reporting initiative (GRI) is the most widely used international guideline for sustainability reporting.

extraction of a natural resource. Third, stakeholder involvement can improve the effectiveness of biodiversity management. NGOs such as the Wildlife Habitat Council (WHC) and World Wide Fund for Nature (WWF) have recognized expertise in this area and can help managers implement specific measures (Rands et al. 2010). Moreover, certain biodiversity initiatives (e.g., creation of protected areas, site rehabilitation, verification and certification mechanisms, voluntary agreements, and conflict resolution) require the agreement of, or active collaboration with, various stakeholders, including public authorities.

Nevertheless, managers may be perplexed by these collaborations, which may be perceived as interfering in the management of organizations. Indeed, managers may question the purpose of stakeholder involvement. Moreover, decisions about which stakeholders to involve and which initiatives to involve them in are not easily reached and they raise questions that remain largely unanswered at this time. Although the literature on environmental management has shown the importance of taking the interests and expectations of stakeholders into account (Hart and Sharma 2004; Buysse and Verbeke 2003; Cragg and Greenbaum 2002), very few studies have focused on the concrete involvement of stakeholders in biodiversity management. The few studies that do exist have focused primarily on the processes of inter-organizational collaboration that support the development of conservation initiatives (Cardskadden and Lober 1998; Salafsky et al. 2001; Mahanty and Russel 2002; Westley and Vredenburg 1997), possible outcomes of these processes (Young et al. 2007), the management of conflicts on biodiversity issues between various stakeholders (Young et al. 2007), and the avenues for future research on business, ecosystems and biodiversity (Winn and Pogutz 2013).

Most of the empirical studies on organizations and biodiversity are based on a limited sample of cases and are no longer very recent. Moreover, the literature has focused on the socio-political aspects of stakeholder involvement from a very general perspective. To our knowledge, the motivations for stakeholders to engage in biodiversity initiatives, the stakeholders involved in these initiatives and the type of measure implemented have not been studied extensively and comprehensively in the literature, which has essentially investigated the benefits and development process of inter-organizational collaborations on biodiversity projects through specific case studies.

The paper contributes to this literature by providing a more comprehensive view of the details of biodiversity management through stakeholder involvement. The paper also contributes to the literature on stakeholder theory by exploring the reasons for stakeholder involvement and the nature of stakeholders with whom companies tend to collaborate.

Biodiversity Management and Stakeholder Involvement

The Role of Natural Resource-Based Industries in Biodiversity Conservation

Biodiversity, or biological diversity, can be defined as the variety and abundance of living forms in a given ecosystem, including plant and animal species as well as microorganisms (Convention on Biological Diversity 1992; WWF 2014). Although this concept is relatively new, a growing body of research emphasizes the critical role of biodiversity conservation, which is now

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considered a main component of sustainable development (SCBD 2010; Jones and Solomon 2013; WWF 2014). The rate of biodiversity loss has dramatically accelerated over the last few years, and more than 50 % of species listed by the Union for Conservation of Nature are considered to be already extinct, endangered, threatened or vulnerable (SCBD 2010). According to the latest WWF Living Planet Report (WWF 2014), global biodiversity has dropped by half since 1970 due to human activity.

The impact of the loss of biodiversity has increased institutional pressures on companies and represents a growing ethical issue for decision makers. Although the effectiveness of measures designed to protect biodiversity has been much criticized, governmental programs, regulations, and private initiatives in this area have multiplied over recent years (Jones and Solomon 2013; GRI 2007; Bonini and Oppenheim 2010; Winn and Pogutz 2013). As a result, corporate commitment to preserving biodiversity is increasingly scrutinized by stakeholders and is regarded as an important aspect of business ethics and environmental management (Bonini and Oppenheim 2010; GRI 2007; Rimmel and Jonäll 2013; Van Liempd and Busch 2013). This is especially the case for companies whose operations are based on the exploitation of natural resources, such as the forestry and mining industries.

Because the forestry and timber industry directly depends on the management and exploitation of large forested areas, its activities can have significant impacts on the conservation of biodiversity (Putz et al. 2001; Fisher et al. 2011). Logging operations are often located in ecologically sensitive areas requiring the monitoring and conservation of biodiversity (Fisher et al. 2011; Didham 2011). In many parts of the world, the deforestation resulting from excessive tree cutting has resulted in the rapid loss of biodiversity and the extinction of certain species (SCBD 2010). Similarly, mining activities have significant impacts on biodiversity (e.g., Wishart 2012; Dobele et al. 2013; Cragg and Greenbaum 2002; Boiral 2013). Blasting operations, clear-cutting, excavation, extraction, transportation and transformation of rocks, and road building can dramatically change the landscape and irreversibly disturb local ecosystems. The various environmental impacts of these disturbances are well documented. They include but are not limited to soil and water contamination, erosion, loss of vegetal cover, noise pollution, visual pollution, and dust emissions (Kitula 2006; Azapagic 2004; Wishart 2012).

These impacts and the increasing pressures to conserve biodiversity have reinforced the need to implement specific measures to protect biodiversity, particularly for industries that profit from the exploitation of natural resources, such as forestry and mining companies. Because of their complexity, the size of the institutions involved, and their socially sensitive nature, biodiversity issues and conservation initiatives call for collaboration with various stakeholders (Reed et al. 2009; Mahanty and Russell 2002).

Stakeholder Involvement and Environmental Management

According to stakeholder theory, organizations must take into account the interests and expectations of their various stakeholders, defined as ''any identifiable group or individual who can affect the achievement of an organisation's objectives, or who is affected by the achievement of an organisation's objectives'' (Freeman and Reed 1983, p. 91). According to this theory, organizations are not only accountable to their shareholders. They must also take into account

the needs of various groups or individuals who have a direct or indirect stake in their activities: employees, customers, government agencies, NGOs, suppliers, and the media (e.g., Donaldson and Preston 1995; Jones 1995; Laplume et al. 2008; Reed et al. 2009).

Some studies have highlighted the importance of stakeholder involvement in managing complex environmental issues, improving corporate legitimacy, and promoting a proactive environmental strategy (e.g., Buysse and Verbeke 2003; Cragg and Greenbaum 2002; Pasquero 1991). The benefits, constraints, and conditions for the success of stakeholder participation in environmental projects have also been studied (Cardskadden and Lober 1998; Kapoor 2001; Salafsky et al. 2001). Some articles have focused on specific case studies, describing the process of stakeholder participation in areas such as ecotourism (Fletcher 2009), the development of environmental public policies (Pasquero 1991; Turcotte and Pasquero 2001), and the marketing of green products (Westley and Vredenburg 1991; Prakash 2002).

However, few studies have specifically focused on the role of inter-organizational collaboration and stakeholder participation in the management of biodiversity issues. The collaborative programs initiated by non-profit organizations such as the Biodiversity Conservation Network, the Wildlife Habitat Council, and the Union for the Conservation of Nature have previously been explored (Cardskadden and Lober 1998; Salafsky et al. 2001; Mahanty and Russell 2002; Westley and Vredenburg 1997). These studies show the complexity of collaborative programs, their potential benefits, and the diversity of local arrangements that may be used to coordinate conservation initiatives. Young et al.'s (2013) study of the establishment of protected areas raises questions about the positive outcomes of stakeholder involvement for biodiversity conservation. The management and monitoring of conflicts between various stakeholders in biodiversity conservation and human activities has also been studied from a political and economic perspective (Young et al. 2007).

The literature, however scattered, makes clear the importance and complexity of stakeholder management in biodiversity conservation programs. These programs cannot be controlled by a single organization in a top-down manner (Fraser et al. 2006). Nevertheless, the literature on stakeholder participation in biodiversity conservation programs does not focus on the role of companies, but rather on the general process of collaboration and the specific role of civil society, especially NGOs. Yet natural resource-based companies are often essential players in conservation efforts, particularly when they own or manage a large territory with rich biodiversity, as is often the case in the forestry and mining sectors (Didham 2011; Wishart 2012).

As a result, essential questions about how companies from these sectors can manage biodiversity issues through stakeholder participation remain unanswered or under-researched. These questions revolve around the issues of ''why,'' ''who,'' and ''for what,'' which have been widely debated in the general literature on stakeholder theory and inter-organizational collaboration (e.g., Mitchell et al. 1997; Cragg and Greenbaum 2002; Unerman et al. 2007). This study focuses on these three essential questions:

- Why do companies decide to take stakeholders' expectations and interests into account in relation to biodiversity issues?

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- Who should be involved in biodiversity management?
- For what types of measures or initiatives should companies involve stakeholders?

The first research question (summarized as 'why?') focuses on the raison d'être of stakeholder theory and has been addressed in the literature in various ways (e.g., Mitchell et al. 1997; Donaldson and Preston 1995; Cragg and Greenbaum 2002). Some have focused on the ethical and normative reasons for considering stakeholders as part of the moral obligations of companies (e.g., Gibson 2000; Orts and Stredler 2002). The institutional and strategic benefits of considering stakeholders to develop corporate image, improve social legitimacy, and contribute to competitiveness have also been highlighted (e.g., Sarkis et al. 2010; Jones and Solomon 2013). Other research has focused on the emergence of new forms of governance and new regulations requiring the involvement of stakeholders in decision-making (e.g., Freeman and Reed 1983; Donaldson and Preston 1995).

These general reasons also apply to stakeholder engagement in biodiversity conservation, although this issue remains under-studied. The protection of ecosystems clearly raises ethical concerns for various stakeholders (e.g., the local population, environmental associations, and fisher and hunter organizations) whose interests should be taken into account as far as possible (Kapoor 2001; Brechin et al. 2002; Orts and Stredler 2002). Collaborating with these stakeholders can improve the social legitimacy of biodiversity management, facilitate knowledge-sharing, and avoid conflicts with local populations (Pistorius and Reinecke 2013; Young et al. 2007). Such collaboration also tends to be part of a larger movement in which biodiversity issues are not only the responsibility of governments or specialized organizations, but rather are managed through a multi-stakeholder process (Reed et al. 2009; Brechin et al. 2002; Pistorius and Reinecke 2013). Although the general factors explaining the development of a multi-stakeholder and transdisciplinary approach in the conservation of biodiversity have been explored in a few studies (Reed et al. 2009; Brechin et al. 2002; Winn and Pogutz 2013), the specific reasons why companies should engage in this process remain underexplored, especially in the case of forestry and mining organizations.

The second research question (summarized as 'who?') is also one of the main issues of stakeholder management because of the wide range of organizations and individuals that can affect or be affected by corporate activities (Freeman and Reed 1983; Mitchell et al. 1997; Donaldson and Preston 1995). To address this issue, various approaches to identifying and selecting key stakeholders have been proposed in the literature (e.g., Mitchell et al. 1997; Dobele et al. 2013). Identification can be based on the stakeholders' relationship with or dependence on organizations, their power to influence, social legitimacy, or specific demands. These criteria are rather general and unspecific, and may vary depending on the context and the objectives for involving stakeholders. Moreover, stakeholder involvement is not necessarily initiated by corporations and is consequently not necessarily based on the corporation's preliminary identification criteria.

Various studies have shown that collaborative initiatives for biodiversity can be initiated and coordinated by NGOs (Cardskadden and Lober 1998; Salafsky et al. 2001; Mahanty and Russell 2002; Westley and Vredenburg 1997). Generally speaking, the company is not necessarily at the center of stakeholder networks (Dobele et al. 2013). Nevertheless, the existing literature does not

enable us to paint a global picture of the types of stakeholders involved in biodiversity conservation projects with companies, notably in the mining and forestry sectors.

The third question (summarized as 'for what?') focuses on the measures and institutional arrangements arising from stakeholder participation. These measures have been the object of various studies of the types of partnerships developed with stakeholders and their possible outcomes (e.g., Polonsky 1995; Laplume et al. 2008). Some studies have focused on the different levels of stakeholder involvement, which can vary significantly depending on the measure implemented and its objectives (Bryson 2004; Green and Hunton-Clarke 2003). The nature and scope of stakeholder involvement has also been studied from a more concrete perspective in the area of environmental management and biodiversity conservation (Westley and Vredenburg 1997; Mahanty and Russell 2002; Salafsky et al. 2001).

For example, Rogers and Weber (2010) have analyzed various cases of successful collaborations in the areas of clean water supply, forest management, land conservation, endangered species protection, and sustainable communities. Yet the literature describing stakeholder involvement is either too general (focused on general typologies or theoretical concepts) or else too narrow (focused on very specific cases studies) to provide a consistent overview of the types of practical measures that organizations can implement in cooperation with stakeholders in relation to biodiversity conservation.

In summary, while the role and positive outcomes of stakeholder involvement in biodiversity conservation has been highlighted in the literature, the main questions of why, who, and for what remain underexplored. Moreover, the literature has overlooked the specific situation of companies from natural resource-based sectors such as forestry and mining. For a more comprehensive and practical view of biodiversity conservation initiatives and stakeholder involvement, a study based on a large sample of cases from these sectors is necessary.

Methods

Sample Selection

The study is based on a content analysis of sustainability reports that use the GRI reporting framework. The focus on GRI sustainability reports is justified by the widespread use of this standard in large mining and forestry organizations and its inclusion of specific indicators of biodiversity (GRI 2006, 2007; KPMG 2013). The following indicators[2] cover various issues related to biodiversity: location and size of land managed or owned adjacent to areas of high biodiversity (EN11); description of significant impacts of activities, products, and services on biodiversity (EN12); habitats protected or restored (EN13); strategies, current actions, and future plans for managing impacts on biodiversity (EN14); and number of conservation list species in areas affected by operations by level of extinction risk (EN15). Furthermore, the GRI framework focuses on accountability to stakeholders and transparency of information, requiring organizations to report on their involvement. GRI principles and indicators clearly stress the

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[2] The indicators related to the environmental dimension of sustainability reporting are codified with the EN abbreviation in the GRI model.

importance of stakeholder engagement, which can be defined as ''those practices which an organization undertakes to involve stakeholders in a positive manner in organizational activities'' (Greenwood 2007, p. 317).

Our focus on sustainability reports from mining and forestry organizations is explained by their impact on biodiversity (Putz et al. 2001; Fisher et al. 2011; Wishart 2012; Jenkins and Yakovleva 2006) and their tendency to use the GRI as their primary reporting framework (KPMG 2013). This study focuses on the reports available in the GRI sustainability disclosure database,[3] which use the same version (G3) and which were made between 2008 and 2012. We focus on this reporting period for three reasons. First, the GRI G3 version was adopted by most organizations in 2007-2008 and was used up until 2012 for most GRI reports. Although the G3.1 version, launched in 2011, is not very different from the G3 version, this study uses the G3 version exclusively in order to facilitate data analysis and comparisons of the same indicators. Second, the lag between the report's date of publication and the year it covers often exceeds one year. Because data were, for the most part, collected and analyzed in 2013, the most recent reports reported on 2012. The apparent decrease in GRI G3 reports in 2011 and 2012 (see Table 1) is explained by the progressive adoption of the GRI G3.1 version from 2011 onwards. Third, although biodiversity conservation is very important, the information released on this issue represented, on average, around 5 % (3–4 pages) of each report. Moreover, not all reports released detailed information on stakeholder engagement on biodiversity issues, although most often such engagement was mentioned.

Table 1 GRI sustainability reports analyzed by reporting period

Reporting period	Forestry sector	Mining sector	Total
2008	28	46	74
2009	40	74	114
2010	41	80	121
2011	29	48	77
2012	13	31	44
Total	151	279	430

The 5-year period of coverage (2008–2012) made it possible to collect sufficient information to address the three main questions of this study: why stakeholder involvement was considered by companies, who was involved, and for what types of initiatives. Although these questions may seem quite broad, they are inextricably linked and focus on a very specific type of environmental initiative (stakeholder involvement in biodiversity initiatives) on which very little or no information is reported in each report taken individually. The large number of reports analyzed therefore allowed us to collect enough information to provide an overall picture of stakeholder involvement in biodiversity.

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[3] The format of, information made available (addition or removal of certain reports) and the Internet address of this database have changed overtime. Currently, this database is available at http://www.database. globalreporting.org/search (consulted in February 2014).

For linguistic reasons only reports available in English or French were analyzed. The study does not take into account the application levels of the reports (A+, A, B+, B, C+, C), which are supposed to indicate the completeness of the report and the process used for its assurance.[4] Indeed, it quickly became clear that the amount and quality of information released on biodiversity did not necessarily depend on the report's application level. The same remark applies to the verification of the reports by external auditors, which happened for 39.7 % of all reports analyzed.

In total, 430 reports (151 from the forestry sector and 279 from the mining sector) met all of the selection criteria for our sample and were analyzed (see Table 1).

Data Analysis

Qualitative content analysis can be defined as a ''research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns'' (Hsieh and Shannon 2005, p. 1278). This classification process is frequently used for qualitative studies (Strauss and Corbin 1990; Kohlbacher 2005). Unlike hypothetico-deductive reasoning, this approach is not intended to validate theoretical models, or a hypothesis defined a priori, but rather to develop ideas, concepts, or theories grounded in data. Data is analyzed through a systematic process of coding and categorization intended to group information around similar concepts or themes emerging from the analysis. The development of categories is therefore not shaped by existing concepts or theories but rather by the relevant information on biodiversity and stakeholder management released in the reports analyzed. This categorization process was facilitated by the qualitative analysis software QDA Miner (Version 4.0.4), which made the storage, comparison, and analysis of information easier and more flexible. The data analysis process was based on four steps.

First, the information on biodiversity issues was extracted from the sample of GRI reports and saved in a specific file for each report. The use of key words (i.e., stakeholders, inter-organizational collaboration, biodiversity, biological diversity, EN11, EN12, EN13, EN14, EN15) facilitated the identification of relevant information, which was sometimes scattered throughout quite lengthy reports and, therefore, not limited to the biodiversity section. The passages on biodiversity collected from the reports represented the equivalent of about 1500 pages.[5]

Second, a categorization framework for data classification was developed. This framework was initially based on a few preliminary categories related to the main objectives of the study. As proposed by grounded theory and qualitative content analysis approaches (Strauss and Corbin 1990; Kohlbacher 2005), this preliminary categorization framework was further developed and reorganized through the process of data analysis. More specific categories were created

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[4] Reports with a plus (A+, B+, C+) have been verified through an external assurance process. Levels A, B and C describe the completeness of the report in terms of disclosure on performance indicators, sector supplement indicators, and management approach (GRI 2006).

[5] This estimation is based on single spaced text and does not take into account the images inserted in the reports.

depending on the data analyzed. These included the motivation for, nature of, and outputs of stakeholder engagement. Other categories were grouped according to their similarities. As proposed by Miles and Huberman (1994), each category was clearly defined and described in detail. These definitions made the consistent application of the categories possible, regardless of who conducted the data analysis.

Third, the information on biodiversity issues extracted from the GRI reports was systematically analyzed and coded according to the categorization framework. In order to reduce possible biases in the interpretation of codes and GRI reports, the coding of GRI reports from each sector of activity (forestry and mining) was conducted by two coders. Several meetings were held with the coders to discuss the categorization framework, the creation of new codes, and the definition of these codes. Although the coders worked independently of each other, their results converged.[6] At the end of the categorization process, 5335 passages were grouped into 94 categories.

Fourth, the main categories were analyzed and interpreted. These categories and the related passages from the GRI reports were reorganized around the three main questions that emerged through the data analysis (see Table 2).

The search function of QDA Miner was used to complete the analysis, cross-tabulate certain information, extract specific passages and, in some cases, conduct measurements. Wherever possible and relevant, comparisons between the mining and forestry sectors were also conducted, although these comparisons were not the main object of the study. Moreover, measurements of the intensity, frequency, or tendency over time for different results were generally difficult if not impossible because of the qualitative nature of the data collected and the interdependency of various phenomena. Although qualitative methods are not suited to statistical measurements (Gephart 2004), the relative importance of certain results was, when possible and meaningful, estimated from the proportion of passages coded in different categories or the number of reports mentioning specific themes. These quantitative estimates were independently measured by two coders based on the results of the categorization process. The measurements were then discussed in detail with both coders and the principal researcher in order to estimate, as precisely as possible, the frequencies of occurrence of the main results.

The following sections of the results are structured around the three main questions of the study and the main categories related to these questions. Passages representative of the results were extracted from the categories to answer the research questions.

Why Do Companies Involve Stakeholders in Biodiversity Conservation?

With regard to the first research question, sustainability reports rarely explicitly address the reasons why companies involve stakeholders in biodiversity management. Rather than focusing directly on their motivations for stakeholder engagement, most reports describe the objectives and benefits of their initiatives in this area. The ''why'' question is nonetheless indirectly addressed in roughly one third of all reports analyzed. The passages on this issue revolve around four main interdependent motivations:

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[6] Inter-coder reliability was analyzed for 32 reports and the two coders were in agreement for 81 % of passages, which can be considered acceptable (Miles and Huberman 1994; Campbell et al. 2013).

- Complexity and knowledge management;
- Self-regulation and relationships with public authorities;
- Legitimacy and social responsiveness;
- Commercial and strategic objectives.

Complexity and Knowledge Management

One of the most common justifications for involving stakeholders in biodiversity management projects (around 30 % of the coded passages on motivations) is related to the complexity of this issue and the knowledge it requires. The lack of expertise on biodiversity within an organization and the large area of land covered by many operations, especially in the case of the forestry industry, require stakeholder engagement to better understand and monitor biodiversity issues on a large scale. For example, the 2009 report of the Portucel Soporcel Group (2010) highlights that the company is ''Portugal's largest forest owner'' and ''currently manages approximately 120 thousand hectares of forests'' (p. 57).

In this context, the group justifies its partnership with stakeholders for various studies related to biodiversity through ''the scale and the dispersal of the land managed by the Group'' (p. 70). In the same vein, the 2009 Mondi Group (2010) report explains: ''We are determined to play our part in making sustainability a reality, but cannot do so alone. We need to work with all our stakeholders'' (p. 15). The need for greater knowledge on biodiversity can materialize at different levels. Sustainability reports generally highlight the importance of scientific knowledge on biodiversity. Cooperation with stakeholders can contribute to ''provide technical and scientific support'' (APP China 2009, p. 15), to ''apply cutting-edge technologies'' (Portucel Soporcel 2012, p. 64), or ''to refine the science and practice'' (Mondi Group 2009, p. 12) of biodiversity management. A few sustainability reports also recognize the importance of more practical and informal knowledge of local ecosystems provided by communities and indigenous peoples. Such knowledge can contribute to ''identify and help protect forest areas that are priorities for conservation'' (Weyerhaeuser 2011, p. 111).

Generally speaking, whatever its nature, the acquisition of knowledge is rarely presented as a one-way process. It is rather described as a mutually beneficial sharing of experiences and a collective learning process between stakeholders: ''Altri actively collaborates with a wide range of national entities related to the management and promotion of biodiversity, thus allowing an exchange of experiences between research and forest management'' (Altri 2012, p. 11).

Table 2 Summary of the Categorization Grid

Research question	Main categories and subcategories[a]
Why was stakeholder involvement for biodiversity conservation considered by companies?	Complexity and knowledge management innovation, acquisition and sharing of expertise; dispersion and scale of operation areas
	Self-regulation and relationships with public authorities lobbying and pressures; participation in public policy development; development of self-regulation mechanisms
	Legitimacy and social responsiveness image improvement, licence to operate and public support; conflict management and prevention
	Commercial and strategic objectives preservation of strategic resources; commercial pressures
Who was involved with companies on biodiversity issues?	NGOs local NGOs; international organizations for conservation
	Experts and scientists universities and research institutes; others experts
	Public authorities governmental agencies and others governmental organizations
	Local communities citizen's groups; indigenous communities[b]
	Coalitions and industrial associations industrial associations on mining or forestry
	Others employees, others
What were the main initiatives that involved stakeholders?	Practices for biodiversity development and implementation of common standards and guidelines; audits and certification processes; policies and biodiversity action plans or management models; development of performance indicators; employee training programs
	Socio-political actions programs for public awareness and education; donation and sponsorship; stakeholder consultation, debates, and conflict resolution; participation in public policy, voluntary agreements and lobbying
	Research and conservation restoration and site rehabilitation[c]; research programs, inventorying and monitoring biodiversity; creation of protected areas, ecological corridors and others conservation measures; reforestation

[a] These categories are not necessarily mutually-exclusive. As a result, when relevant, certain passages covering several topics have been coded in more than one category. For example, certain collaborative initiatives involved several stakeholders such as NGOs, industrial associations and public authorities

[b] Although indigenous communities are the object of a specific indicator related to human rights (HR9), they are often affected by biodiversity measures and can be considered as an integral part of local communities

[c] Restoration can be defined as "the process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems" (Jackson et al., 1995, p. 71). Restoration is therefore not limited to the planting of trees (or reforestation) and is intended to re-establish as much as possible the local ecosystem to its original state

Self-regulation and Relationships with Public Authorities

The majority of reports analyzed refer to government initiatives for biodiversity and simply indicate the companies' compliance with the existing regulations. Nevertheless, some companies go beyond compliance and report (in about 28 % of coded passages on motivations) how they can play a more active role in biodiversity management through stakeholder management. First, companies can influence the development of regulations and public programs through lobbying and by putting pressure on stakeholders. Although the GRI requires organizations to disclose information on their participation in public policy development and lobbying, none of the reports analyzed were explicit on this issue, which can undermine their corporate image. Nevertheless, the lobbying activities of companies can be indirectly deduced. For example, the 2008 Catalyst report (2009) indicates that the company ''routinely participates in advocacy regarding regulatory matters relevant to its operations'' (p. 33).

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Second, stakeholder engagement can help companies reduce regulatory pressures and constraints. For example, the 2009 Xstrata report (2010) explains how the McArthur River Mine (MRM) overturned an unfavorable decision concerning the conversion of the mine into an open-cut operation: ''MRM worked extensively with stakeholders following a ruling by the Australian Federal Court that invalidated the original Australian Government approval for the conversion. The Australian Government reviewed the decision and confirmed its approval'' (p. 26).

Third, companies can collaborate with stakeholders on the implementation of discretionary programs, procedures, and guidance on biodiversity management. For example, according to the 2009 Fibria report, the firm collaborated with stakeholders on the New Generation Plantation Project ''which involves companies and governments to evaluate and establish the best concepts and techniques for forest management'' (2010, p. 41). This type of collaboration on the promotion of ''best concepts and techniques'' may be a self-regulation mechanism intended to prevent a more coercive approach, improve relationships with governments, and implement flexible rules better adapted to the realities on the ground. The same remark applies to collaborations with stakeholders on the enforcement of existing regulations, such as the Legal Wood Program implemented in the Valley of Itajai (Brazil): ''This program is a joint initiative between Klabin and Apremavi (Association for the Preservation of the Environment and Life) which counsels small and medium-sized rural producers on how to plan their properties in compliance with environmental legislation'' (Klabin 2010, p. 54).

Legitimacy and Social Responsiveness

Improving corporate legitimacy and social responsiveness through stakeholder involvement for biodiversity represents a key issue for natural resource-based companies. Nevertheless, this issue was rarely detailed in reports and was only invoked in around 17 % of all quotes on motivations. Three reasons support stakeholder involvement to improve a company's legitimacy and perceived social responsiveness. First, because of the nature of their activities, which are based on the exploitation of natural resources, mining and forestry companies need to improve their image and the social acceptability of their operations. The concept of a licence to operate, which generally refers to the tacit permission that stakeholders and society give to a company to carry out its activities in a specific location, was employed in 11 different reports, all from mining organizations.

For example, the Anglo Platinum report indicates that ''it is through the goodwill of the host communities close to our operations that we are able to gain and maintain our social licence to operate. It is therefore essential that in our approach to doing business we take into account their concerns and their needs.'' (Anglo Platinum 2012, p. 118). Although it is not necessarily explicitly stated, the concept of a licence to operate generally lies behind the justification of stakeholder involvement, which tends to be considered by companies as a tacit acceptance or support for their mining and forestry operations.

Second, natural resource-based companies generally suffer from a lack of credibility to manage biodiversity issues by themselves. Although this point is rarely explicitly acknowledged, stakeholder engagement is recognized as a way to reinforce their credibility and support for biodiversity initiatives. As summarized in the 2008 Weyerhaeuser report (2009), ''establishing

new protected areas and adopting forest-management policies require public support and government action, so Weyerhaeuser is also working to engage governments, communities, and indigenous peoples in these efforts'' (p. 59).

Third, stakeholder engagement can be aimed at preventing or resolving conflicts, notably with local populations and NGOs. For example, Stora Enso recognizes, in its 2008 sustainability report, that meetings with external stakeholders made it possible to manage criticisms better on land management from NGOs such as Via Campesina and Friends of the Earth: ''Although this face-to-face dialogue organised did not reach a common understanding, it at least allowed the parties to hear one another's views. We agreed to continue the dialogue, which is a valuable result for future conflict resolutions'' (2009, p. 10). Nevertheless, conflicts with stakeholders are mentioned in less than 5 % of all reports analyzed. The information disclosed on biodiversity and stakeholder involvement tends rather to be focused on positive and reassuring general statements clearly intended to reinforce the image of corporate responsibility.

Commercial and Strategic Objectives

Stakeholder engagement can also be explained by commercial and strategic considerations, which account for around 14 % of all quotes about motivations. This motivation seems more important in the forestry industry where biodiversity protection is more clearly associated with commercial pressures. First, stakeholder engagement for biodiversity conservation can be necessary to preserve the natural resources on which operations are based. With external stakeholders, Forests NSW has implemented ''active coordinated and cooperative programs'' to control invasive species and ''animal pests'' including ''foxes, wild dogs, feral goats, feral pigs, blackberries, willow, serrated tussock, horehound, lantana and Paterson's curse'' (2011, p. 40).

Second, biodiversity conservation can serve marketing purposes. Certain standards, such as the FSC certification,[7] are focused on sustainable forest management which includes stakeholder involvement and biodiversity conservation. The commercial pressures for the adoption of this standard can lead to initiatives motivated by economic objectives. For example, the 2010 Domtar report (2011) explains that the company ''supports several initiatives to promote FSC certification among private forest landowners. The objective is to increase the availability of FSC-certified fiber in our markets to meet the growing demand for sustainable papers'' (p. 7). Biodiversity conservation can also serve marketing purposes for several organizations working in partnership. For example, ''Sappi Limited and car manufacturer Volvo South Africa established a joint initiative Green For Blue, whereby Volvo drivers are encouraged to sponsor the planting of indigenous trees for each Volvo car bought to mitigate the emissions of harmful gas from engines'' (Sappi 2010, p. 37).

Who is Involved?

With regard to the second research question, it is clear that the stakeholders involved in biodiversity initiatives can be very diverse, depending on the type of actions being implemented.

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[7] The Forest Stewardship Council (FSC) certification aims to promote the sustainable forest through the implementation of various environmental management practices, including consultations with the stakeholders affected by forestry operations.

Certain reports describe a large number of partnerships, participations, and collaborations in order to show their corporate concern for stakeholder engagement. Biodiversity initiatives generally involve four main types of stakeholders: NGOs, public authorities, experts and universities, and coalitions of companies. Figure 1 summarizes the distribution of these stakeholders for the mining and forestry sectors.

NGOs and Local Communities

NGOs and local communities are the stakeholders most frequently cited in sustainability reports with regard to biodiversity initiatives (Fig. 1). The involvement of these stakeholders can serve various purposes: improving corporate legitimacy and social responsiveness through partnership with representatives from civil society, acquiring specific expertise or local knowledge through specialists from NGOs, managing pressures from stakeholders, and implementing a management system. Such involvement tends to occur at two different but complementary levels. First, at a local level, initiatives for biodiversity can involve small NGOs and the representatives of citizens' groups, including villagers, local associations for conservation, and community leaders. Local communities also include indigenous people whose traditional way of life can be affected by corporate operations and its impacts on biodiversity. Nevertheless, very few reports are explicit and clear on the way indigenous communities are involved in biodiversity efforts. For example, Weyerhaeuser explains in its wood procurement policy that the company works with ''indigenous peoples and communities to identify and help protect forest areas that are priorities for conservation.'' (2012, p. 206).
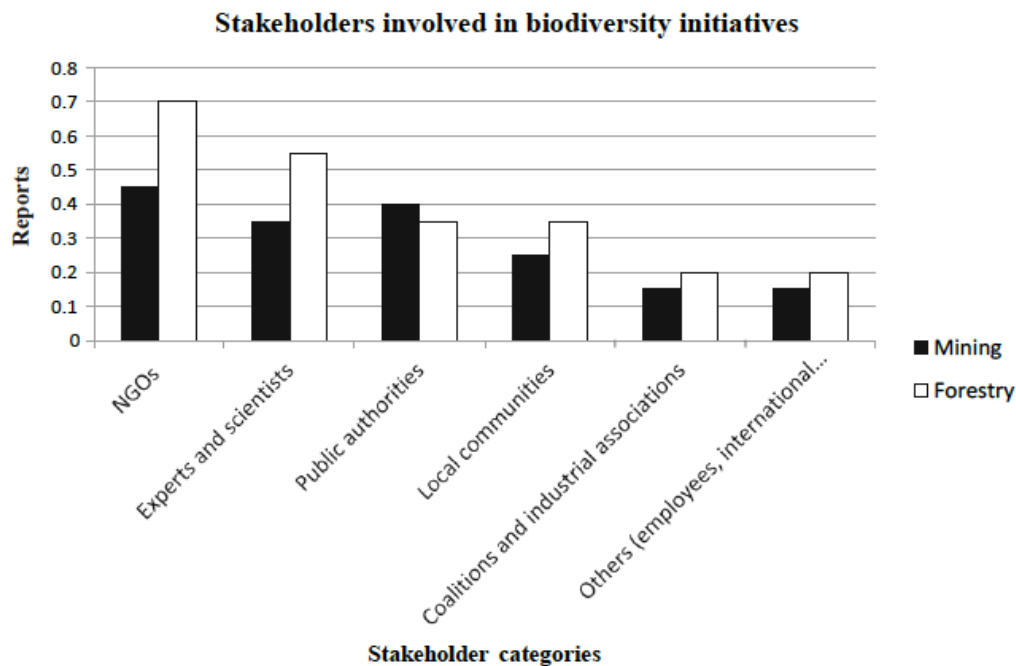

Fig. 1 Stakeholders involved in biodiversity initiatives. Based on the frequency (within 2 %) of stakeholder involvement in specific biodiversity initiatives explicitly reported in GRI reports from mining companies (n = 279) and forestry companies (n = 151)

Second, at a global level, companies can work with larger international NGOs, notably those who specialize in biodiversity conservation. While many NGOs are involved in biodiversity conservation, the Forest Stewardship Council (FSC), Flora and Fauna International (FFI), Wildlife Habitat Council (WHC) and the World Wide Fund for Nature (WWF) are the most frequently cited in the sustainability reports analyzed. The recurrent involvement of these specific NGOs shows that they have developed recognized competencies and specific areas of intervention. The FSC is at once a label, a management system, and an international NGO. It is essentially involved in the promotion of sustainable practices and certification in the forestry sector, although three mining reports (Boliden 2012, 2013; Fairmount Minerals 2009) also mentioned it. On the other hand, FFI and WHC were only cited in reports from the mining sector in relation to biodiversity assessments and certification. Finally, partnerships with the WWF came from both sectors and were more diverse, though essentially focused on research, education, and the conservation of specific areas. For example, De Beers Group explains that the company has ''entered into a research partnership with the WWF and the South African National Biodiversity Institute to support biodiversity conservation in the Namaqua bioregion'' (2010, p. 96).

Experts and Scientists

Experts and scientists represent the second most often mentioned stakeholder group in sustainability reports with regard to biodiversity initiatives (Fig. 1). Their importance clearly reflects the complexity of biodiversity issues and companies' need for specialized knowledge. Depending on the objective of their involvement, these experts can come from various organizations (e.g., universities, institutes, research centers, government) or they may be independent consultants. They have very different areas of expertise (e.g., oceanography, forestry, biodiversity and climate change, specific alien species, wildland fires, ecological services, genetic analysis, plants, insects, amphibians and reptiles, and birds).

This involvement often occurs in the framework of specific research projects and allows companies to access expertise that would either be impossible or too costly to develop internally. Nevertheless, reports rarely provide details of their partnerships with experts and scientists. Such partnerships are most often described in general terms, as in the case of Fortescue Metals Group: ''In addition to our routine monitoring and management activities, we partner with a variety of academic and specialist consultancies on research projects. These partners include researchers from the University of Western Australia (UWA), Australian National University (ANU) and specialised environmental consultants'' (2011, p. 22).

Public Authorities

Public authorities are also frequently involved in biodiversity initiatives, notably in the mining sector. This involvement may concern various agencies and levels of government (e.g., Environmental Protection Agencies, Departments of Environment and Natural Resources, Departments of Forestry, Ministries of Agriculture, Conservation Agencies, Public Conservation Reserves, provincial governments, and municipalities). This diversity may be explained by the complexity and multifaceted nature of biodiversity conservation, which may involve different levels of government and various regulatory standards. Moreover, most biodiversity issues (e.g.,

conservation of endangered species, prevention of invasive species, pest and disease control) are clearly of public interest and therefore are within the purview of governments. It is mainly the responsibility of the government to decide whether or not to grant operating licences for economic activities, which is why they represent such an important stakeholder for natural resource-based companies.

In developed countries, the involvement of public authorities most often happens through specialized agencies and departments. Conversely, in developing countries, those specialized bodies often do not exist and decision-making power tends to be more centralized. As a result, partnerships with companies are developed at the level of central governments and can be quite extensive. This is the case of the Leadership for Conservation in Africa (LCA) initiative, sponsored by Gold Fields to ''pursue socio-economic development through conservation on the African continent'' (Gold Fields, 2009, p. 80).

Coalitions and Industrial Associations

Partnerships on biodiversity issues with business coalitions and industrial associations are mentioned in nearly 20 % of reports. This involvement reflects the need to represent companies and to develop consistent, industry-wide positions on debates with other stakeholders. In the mining sector, this role is played by the International Council on Mining and Metals (ICMM). According to the ICMM's 10 principles of sustainable development, which are endorsed by most mining companies, organizations should ''contribute to conservation of biodiversity and integrated approaches to land use planning'' (ICMM 2003). Moreover, the ICMM has developed various reports on this issue, notably the ''Good Practice Guidance for Mining and Biodiversity'' (ICMM 2006), and a collection of case studies on mining and biodiversity (ICMM 2010). These practical documents can be used in benchmarking different practices for biodiversity management. The ICMM is also involved with companies in multi-stakeholder discussions and working groups on biodiversity.

In the forestry sector, this representative role is more scattered and can be played by different associations. These include the Confederation of European Pulp and Paper Industry (CEPI), the International Council of Forest & Paper Associations (ICFPA), and the Forest Product Association of Canada (FPAC). For instance, in collaboration with several forestry companies the CEPI has established the Biodiversity Issue Group, which has promoted various initiatives, including the development of a handbook intended to show ''companies how to enhance forest biodiversity, using selected best practice case studies'' (CEPI 2009, p. 33).

Other stakeholders, including suppliers and employees, were also cited. Nevertheless, whatever the relevance and intrinsic importance of these stakeholders may be, they seem to play more of a secondary role in the development of partnerships on biodiversity issues.

What are Initiatives For?

Regarding the third research question, although the specific initiatives resulting from stakeholder involvement presented in the reports are very diverse, they revolve around three main areas: practices for biodiversity management, socio-political action, and research and conservation

measures. These areas are not mutually exclusive but interdependent. Table 3 summarizes, for each area, the main initiatives identified,[8] their frequency, the motivations for them and the stakeholders involved.

Management Practices for Biodiversity

The management practices for biodiversity and its certification essentially focus on the application of general management principles to biodiversity issues: implementation of a management system, development of a policy, planning, and control (Table 3). The stakeholders most often involved are international NGOs and, to a lesser extent, industrial associations. These stakeholders contribute to reinforce the social legitimacy of corporations and to develop new forms of governance based on voluntary participation rather than traditional regulation. Stakeholders play an active role in the development and implementation of common standards and guidelines, which are explicitly mentioned in more than half of all reports. In the forestry sector, nearly 70 % declare an FSC forest management certification. Though its focus is not biodiversity, the FSC standard requires specific measures for the identification, management, and monitoring of high conservation value forests and biodiversity.

In the mining sector, external audits and certification practices used are given in about 5 % of reports. These practices are specifically focused on biodiversity issues and are verified by a conservation NGO (generally the FFI or the WHC). Conversely, the FSC standard is much more general and ISO 14001 has no requirement for biodiversity.[9] Whatever its specific focus, the reliability and effectiveness of certifiable standards on biodiversity remain unclear. Most certified companies describe the benefits of third-party certification rather than the content of the standard and internal implications. These benefits include the implementation of best practices for biodiversity and their recognition by supposedly independent NGOs. For example, according to Anglo American's 2008 report (2009), the verification process conducted by FFI ''has contributed an alternative and independent viewpoint, increased accountability and offered third-party assessment of the Group's approach to biodiversity stewardship'' (p. 30).

Surprisingly, certain important measures covered by most environmental management systems, such as the implementation of performance indicators related to biodiversity (explicitly mentioned in less than 15 % of all reports) and employee training (mentioned in just over 10 % of all reports) seem poorly developed and are rarely implemented in collaboration with stakeholders. The same remark applies to the implementation of specific policies, plans, and programs for biodiversity (often called BAPs or biodiversity action plans) which are mentioned in about 25 % of all reports.

Socio-political Actions

Socio-political actions focus on external measures directed toward stakeholder management and public relations rather than internal practices (Table 3). These measures are clearly intended to improve corporate image and social legitimacy, although they can also have strategic impacts

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[8] Each initiative is associated with a specific sub-category resulting from the QDA categorization process.
[9] ISO 14001 has therefore not been considered in this study.

and contribute to the governance of biodiversity. Various external stakeholders (e.g., industrial associations, public authorities, NGOs, and local citizens) can be involved depending on the nature of biodiversity initiatives. The most frequent socio-political activities, mentioned in nearly a quarter of all reports, consist of educational programs for local communities on conservation issues. These are aimed at helping stakeholders themselves take action on biodiversity issues.

Table 3 Biodiversity initiatives based on stakeholder management

Sub-categories of initiatives identified (For What?)	Percentage*		Main motivations (Why?)	Main stakeholders (Who?)
	M (%)	F (%)		
Practices for biodiversity management				
Development and implementation of common standards and guidelines	50	70	Improvement of corporate image and legitimacy through the use of recognized and certifiable standards. Acquisition of new knowledge and the improvement of the effectiveness of practices in this area	Active involvement of a few international NGOs and corporate coalitions or industrial associations in the development and verification of standards and guidelines on biodiversity
Audits and certification processes	5	70		
Policies and biodiversity action plans or management models	30	20		
Development of performance indicators	10	20		
Employee training programs	10	15		
Socio-political actions				
Programs for public awareness and education	20	30	Improvement of image and legitimacy through donations and public education. Better understanding of stakeholder expectations and involvement in biodiversity programs through consultation and voluntary agreements	Partnerships with NGOs and local communities through donations, debates, and public education. Collaboration with public authorities, coalitions, and industrial associations in the development of voluntary agreements and public policies
Donation and sponsorship	20	25		
Stakeholder consultation, debates, and conflict resolution	20	10		
Participation in public policy, voluntary agreements, lobbying	15	20		
Research and conservation				
Restoration and site rehabilitation	70	40	Knowledge acquisition and innovation. Improvement of the effectiveness of conservation measures through the involvement of stakeholders in inventories, reforestation, and reintroduction of native species	Active involvement of experts and scientists from universities and government agencies in research, impact assessment, and monitoring programs. Collaboration with local communities and specialized NGOs on conservation measures
Research programs (universities, scientists, and institutes), inventorying and monitoring biodiversity.	35	55		
Creation of protected areas, ecological corridors, others conservation measures	15	30		
Reforestation	10	15		

* Based on the frequency of stakeholder involvement in specific biodiversity initiatives explicitly reported in GRI reports from mining companies (n = 279) and forestry companies (n = 151), within 2 %

For example, Veracel has implemented ''a wide education program in indigenous communities, giving lectures and donating native species seeding'' (2011, p. 57). The same remark applies to sponsorship and donations initiatives. Less than 20 % of reports list initiatives aimed at listening to stakeholders in order to better understand their expectations and interests (e.g., public hearings, stakeholder committees and workshops, and informal consultations with local populations). These consultations often occur prior to new projects and are not exclusively nor specifically focused on biodiversity issues. For example, Barrick Gold conducts Environmental

and Social Impact Assessments (ESIAs) ''at each project prior to development, and during major expansions to existing operations. The ESIA process includes gathering baseline information (quantitative demographics, employment, wildlife counts, soils analysis and qualitative perceptions of the project and the company), consultation with community stakeholders, and consultation with local organizations and NGOs'' (2012, p. 43).

About 15 % of reports refer to measures intended to influence public policies and negotiate agreements with governments (e.g., voluntary agreements, lobbying and involvement in public programs, policies, and pacts on biodiversity). For example, four forestry companies (Canfor 2012; Tembec 2012; Weyerhaeuser 2009, 2010, 2011, 2012; Resolute 2011) describe their involvement in the Canadian Boreal Forest Agreement (CBFA), signed in 2010 between government agencies, 19 member companies of the Forest Product Association of Canada (FPAC) and 7 NGOs. The CBFA is a multi-stakeholder initiative for sustainable forest management practices and protection of boreal forest species (especially the woodland caribou).

Research and Technical Measures for Conservation

Research and technical measures are the most diverse and specialized initiatives for conserving biodiversity mentioned in the reports. These measures are often the operational component and logical consequence of more general programs focused on management practices and socio-political actions with stakeholders. At least three types of measures can be distinguished. First, nearly 60 % of the reports disclose information about biodiversity restoration and site rehabilitation (e.g., revegetation, development of biodiversity offsets, reintroduction of local species, removal of invasive alien vegetation, native plant nurseries). In the forestry sector, these restoration and rehabilitation measures are often based on post-logging reforestation programs, which are mentioned in around 15 % of reports.

In the mining sector, restoration measures generally appear in connection with the closure plans of mining operations. In both cases, the stated objective is to return exploitation sites to close to their natural state. To be credible and achievable, such an ambitious objective requires the participation of stakeholders in the field. For example, the 2009 report of Xstrata Nickel (2010) states: ''We aim to restore drill sites to their natural state within two years. In 2009 we replanted more than 60 sites with seedlings bought from a local nursery. The work is being completed by local workers and coordinated by two nongovernmental organisations operating in the region. We also helped to raise community awareness about the environment by making presentations in nearby villages, and provided support to nurseries and village woodlots'' (p. 75).

Second, nearly half of all reports refer to research and assessment activities, including collaboration with scientists on various projects (e.g., studies on soil fertility, development of new generation plantations, research on the causes and treatment of diseases affecting the growth of trees), impact assessments (e.g., plantation operations, new mining projects, methodologies for impact analysis), and biodiversity inventories (e.g., identification of threatened species, mapping and characterization of the local ecosystem, biodiversity surveys). In most cases, the stakeholders involved are experts from universities, governmental agencies and NGOs. This collaboration can involve sharing the costs of research, spur innovation, and protect biodiversity. For example, according to its 2011 report, Portucel Soporcel (2012) developed a cooperation

agreement with the Iberian Center for Birdlife Research which ''provide[s] technical and scientific support to the Group, with a view to minimizing the environmental impact of its forestry activities, and making these activities compatible with conservation of the Bonelli's Eagle in Portuguese territory'' (p. 64).

Third, about 20 % of reports, most of them from the forestry sector, describe specific conservation measures for the land controlled by companies or adjacent areas (e.g., protection of threatened species, development of wildlife corridors, implementation and protection of high conservation value areas). Long-term collaborations or negotiations with public authorities are often necessary to ensure the conservation of areas that could otherwise be exploited by companies. For example, the 2011 Mondi report (2012) explains that ''after five years of negotiation, agreement has been reached with the Komi Ministry of Nature Resources on the protected area of the Southern Koiyodorok intact forest. Mondi will continue supporting WWF Russia, Silver Taiga and the multi-stakeholder process in Komi with the task of protecting these last remaining intact forests in Europe.'' (p. 29).

Discussion

Stakeholder engagement contributes significantly to initiatives for biodiversity and provides benefits that the companies could not have achieved independently. Certain measures, such as the development of new standards and their certification, implementation of research programs, impact assessments, biodiversity inventories, and the creation of protected areas depend, to a large extent, on stakeholder engagement. These measures are characterized by their complexity and social visibility. High visibility initiatives, such as the creation of protected areas and adoption of certifiable standards, also improve the social legitimacy of corporations on environmentally sensitive issues. This observation is in line with neo-institutional theory, which highlights the role of external pressure and the corporate search for social legitimacy in the adoption of new practices (Meyer and Rowan 1977; Townley 2002; Boiral 2007). Similarly, the results of the study confirm the fundamental premises of stakeholder theory in relation to the importance of considering the interests of a wide range of parties, who can affect or be affected by corporate activities (Freeman and Reed 1983; Donaldson and Preston 1995; Mitchell et al. 1997). By their complexity, long-term impacts, and ethical dimension, biodiversity issues clearly transcend economic interests and concern a large number of stakeholders (e.g., NGOs, public authorities, and local communities) which should be consulted by environmental managers as much as possible.

Contributions and Managerial Implications

This paper contributes to the literature on environmental management and stakeholder theory in three different ways.

First, it sheds new light on the corporate justifications for stakeholder involvement in biodiversity initiatives. Although the reasons why stakeholder interests should be taken into account by companies have already been described in the literature (e.g., Donaldson and Preston 1995; Mitchell et al. 1997; Cragg and Greenbaum 2002), most studies remain quite general and

theoretical. Moreover, the empirical literature based on stakeholder theory has not focused, to our knowledge, on biodiversity management. Likewise, the literature on environmental management has largely overlooked issues of biodiversity, which remains one of the most salient sustainability challenges (Jones 1995; Jones and Solomon 2013; GRI 2007; Bonini and Oppenheim 2010; Winn and Pogutz 2013). This paper contributes to this literature by exploring how companies can manage complex biodiversity issues using stakeholders as a positive lever to action. The motivations for this collaborative approach relate to more general topics in the literature to which the paper makes different contributions. With few exceptions (Sarkis et al. 2010; Plaza-Úbeda et al. 2010), the literature on knowledge management and the literature on stakeholder theory have developed independently of each other.

This paper contributes to bridging the gap between these two important streams of research by analyzing the role of stakeholders in the acquisition of knowledge on an important environmental challenge. This paper also contributes to the literature on the democratization of environmental governance, which seems to be increasingly based on multi-stakeholder processes (Reed et al. 2009; Brechin et al. 2002; Pistorius and Reinecke 2013). More specifically, this paper sheds new light on the way certain stakeholders, notably international NGOs, are involved in the legitimation of organizational practices for biodiversity through auditing practices and others measures. Unlike ISO 14001 certification, which is based on more traditional audits (Boiral 2007), the verification and certification mechanisms proposed by FSC, WHC and FFI are based on the direct involvement of NGOs specializing in environmental issues. To our knowledge, this type of NGO-based certification has not been explored in the literature, and could reinforce the credibility of corporate environmental management. Along these lines, this paper also contributes to the literature on environmental management and neo-institutional theory (Boiral 2007; Sarkis et al. 2010) by highlighting new forms of corporate legitimation through standards developed and verified by environmental NGOs.

Second, the paper contributes to the literature on the nature and identification of the stakeholders that companies should take into account. This literature has essentially focused, from a general perspective, on the identification criteria for stakeholders (e.g., power to influence, social legitimacy, and relevance) and the selection process (e.g., Freeman and Reed 1983; Mitchell et al. 1997; Donaldson and Preston 1995). Nevertheless, the criteria and selection process clearly depend on the issue considered and therefore can hardly be generalized. Rather than focusing on general and theoretical criteria for stakeholder identification, this paper centers on specific cases of stakeholder involvement in biodiversity management based on the information disclosed in sustainability reports. Although the reports analyzed do not explain the pressures exerted by stakeholders and their real impact on biodiversity initiatives, the study contributes to a better understanding of their role and relative importance.

These aspects have been overlooked in the literature. The few studies on stakeholder management and biodiversity issues have essentially focused on the benefits and development process of inter-organizational collaboration for very specific biodiversity conservation programs, such as the Wildlife Habitat Enhancement Programme of the WHC (Cardskadden and Lober 1998), the Biodiversity Conservation Network of the Natural Heritage Inventory Program (Mahanty and Russell 2002; Salafsky et al. 2001), and the Global Collaborative Initiatives for Biodiversity of the International Union for the Conservation of Nature (Westley and Vredenburg

1997). In the same vein, case studies on the development of specific protected areas (Young et al. 2013) and the marketing of green products (Westley and Vredenburg 1991) have explored the main difficulties and outcomes of inter-organizational collaboration on biodiversity issues. Nevertheless, the variety of organizations involved in this type of collaboration and the diversity of initiatives for biodiversity implemented have been overlooked in the literature.

This study provides a more global and comprehensive vision of the role of various stakeholders in the development of a large array of biodiversity initiatives. For example, the active involvement of corporate coalitions such as the ICMM, the CEPI and the ICFPA in the development of guidance for good practice, handbooks, and workshops on biodiversity is interesting and has not been analyzed in the literature on environmental management and stakeholder theory. The study also reveals the near absence of certain stakeholders who may seem to be essential in biodiversity debates, notably indigenous populations. Since mining and forestry operations are often located in remote areas occupied by indigenous peoples (Zimmerman et al. 2001; Schwartzman and Zimmerman 2005; ICMM, 2006), it would seem logical to involve them in debates on biodiversity. Moreover, such involvement is covered by various guidelines and much-used standards such as the FSC standard on sustainable forest management and ICMM's Good Practice Guidance for Mining and Biodiversity. The latter requires companies to ''respect indigenous peoples' rights and values for natural resources and involve them in developing and deciding on appropriate management solutions for potential impacts'' (ICMM 2006, p. 129). Evidence from the sustainability reports analyzed shows that such involvement remains weak. Only about 10 % of all reports analyzed cite biodiversity measures involving indigenous populations. Although indigenous rights have been overlooked in the literature, they represent an important aspect of sustainability (Jenkis and Yakovleva 2006; GRI 2006; Schwartzman and Zimmerman 2005). The under-representation of indigenous people as stakeholders in biodiversity issues suggests that their power to influence outcomes is not regarded as significant by most companies.

Third, this study contributes to the descriptive literature on stakeholder theory (e.g., Sarkis et al. 2010; Jones and Solomon 2013; Donaldson and Preston 1995) and the more specialized literature on biodiversity management (e.g., GRI 2007; Rimmel and Jonäll 2013; Van Liempd and Busch 2013; SCBD 2010; ICMM 2006) by elucidating the collaborative measures that can be implemented in this area. These measures also have managerial implications. This study can help managers identify possible measures to implement, the types of stakeholders to involve, and the reasons why such involvement is relevant for companies.

Limitations and Avenues for Future Research

The limitations of the study call for further research on biodiversity and stakeholder management.

First, the transparency and reliability of the sustainability reports on which the study is based has been roundly criticized in the literature (e.g., Unerman et al. 2007; Owen et al. 2000; Cho et al. 2010; Boiral 2013). Sustainability reporting and corporate communication in general is often used as a tool for managing impressions among stakeholders and improving corporate image (Cho et al. 2012; Bansal and Kistruck 2006; Bansal and Clelland 2004). From this critical

perspective, the information disclosed in sustainability reports could reflect what the stakeholders would like to hear rather than the actual commitment and performance in this area (Cho et al. 2010, 2012; Owen et al. 2000; Boiral 2013). As a result, the information disclosed by companies on biodiversity measures and stakeholder involvement can hardly be considered objective and unbiased. For example, the motivations for biodiversity initiatives are not necessarily clearly reported by companies and may result from external crises or conflicts with stakeholders. The ''managerial capture'' (Owen et al. 2000) of sustainability reporting does not encourage the disclosure of negative or compromising information which can undermine the reputation of companies.

Nevertheless, these limitations also apply to the many empirical studies on sustainability reporting and have been widely recognized in the literature (e.g., Cho et al. 2010, 2012; Unerman et al. 2007; Owen et al. 2000; Hahn and Lülfs 2014). Moreover, this paper does not focus on sustainability performance or negative aspects that could be hidden by organizations but rather on measures generally perceived to be a desirable and ethical behavior, namely collaboration with stakeholders to protect biodiversity. These measures appear all the more desirable as only a minority of companies with significant impact on biodiversity have implemented a formal policy or program in this area (Ceres 2014). As a result, one can assume that companies are disposed to disclose information on this issue, though the information released—like most other sources of information on corporate sustainability—is not necessarily comprehensive, unbiased and objective.

Future research could be based on more diverse and detailed sources of information, including interviews with managers, employees, and representatives of the different stakeholders involved in biodiversity actions. Although the information collected would certainly be influenced by social desirability bias, it would allow the comparison of different views on stakeholder involvement and delve deeper into the measures implemented by companies. It would also enable a better understanding of the motives underlying biodiversity initiatives and what can be truly considered as best practice in this area. Nevertheless, in situ interviews are difficult to conduct because of the diversity of stakeholders, the remote areas in which certain companies operate, and the scattered nature of the information on this issue.

Finally, future research could focus on reports verified by external auditors in order to increase the reliability of the information analyzed and to reduce potential biases related to unverified self-reported data. However, the effectiveness and impact of the external assurance process for sustainability reports has not been clearly demonstrated and has been robustly criticized in the literature (e.g., Perego and Kolk 2012; Boiral 2013; Dando and Swift 2003; O'Dwyer and Owen 2005). For example, in their longitudinal study of third party assurance of sustainability reports, Perego and Kolk (2012) found that many multinationals ''project a decoupled or symbolic image of accountability through assurance, thereby undermining the credibility of these verification practices'' (p. 173). From this perspective, the impact of third party assurance on the reliability of sustainability reports seems at best uncertain. The absence of impact observed in the quantity and quality of information released on biodiversity, depending on the application level and external verification of the reports analyzed in our study, tends to lend credence to those critiques. Moreover, the application level system is no longer used in the new G4 version of the GRI, which is supposed to be adopted by GRI reports by the end of 2015 (GRI 2014). Finally,

whatever the application level of GRI reports, it is unlikely that external auditors can seriously verify the information released on such a complex and specific issue as biodiversity.

Second, the information disclosed in GRI reports is generally positive and is based on optimistic rhetoric rather than transparent and reliable information about performance (Cho et al. 2010; Boiral 2013). As a result, the difficulties encountered by companies in biodiversity and stakeholder management are very rarely mentioned. Moreover, the real impacts of the measures analyzed on environmental performance and the conditions for their success are difficult if not impossible to evaluate from the sustainability reports analyzed. As highlighted by Young et al. (2013), although stakeholder involvement in biodiversity conservation is generally encouraged, the effectiveness of such involvement has not yet been clearly demonstrated. Future research could delve deeper into the impacts and conditions for the success of stakeholder involvement through cases studies of collaborative measures for biodiversity. Currently, the performance indicators for biodiversity are far from reliable, comparable, or standardized (Jones 1995; Jones and Solomon 2013). More detailed cases studies on such a complex issue would require a restricted sample. Reports from NGOs that provide external audits covering biodiversity issues, such as the FSC, FFI and WHC, could also be used. Nevertheless, just as for certification audits in general, the verification of biodiversity management and related reports remains private and confidential. As a result, the possibility of free access to this information and the quality of the data that could be obtained from it seem very uncertain.

Third, the sustainability reports analyzed in this study only focus on the forestry and mining industries. The results may not be fully applicable to other industries. Although this paper provides some quantitative data (e.g., frequency analysis and distribution of stakeholders involved) in order to provide an overview of the relative significance of different results, a qualitative method is not suited to the quantification of information nor to the analysis of tendencies over time (Gephart 2004; Pratt 2009). Moreover, although most GRI sustainability reports of mining and forestry companies are available in English, possible biases regarding the linguistic limitation of our sample of reports should be considered. Future research could be based on a larger and more diversified sample of sustainability reports, including reports in different languages. This type of study could shed light on possible differences of biodiversity reporting depending on the country, language, or sectors of activity. Quantitative content analysis could enable a better measurement of the relative importance of different phenomena and their evolution over time. Nevertheless, given that the information disclosed on biodiversity is essentially qualitative, quite scattered, and not very standardized (despite the use of the same GRI indicators), rigorous quantitative content analysis can only be undertaken with great difficulty.

Quantitative studies of company managers and stakeholder representatives could also be considered. Such studies would be better suited to the validation of hypotheses focused on specific concepts or theories. Propositions on and models of the development of biodiversity initiatives and the role of stakeholder involvement could also be tested. Quantitative studies would enable the measurement of contextual factors, such as the role of the location of companies, ownership characteristics, or implementation of standards such as ISO 14001, on the promotion of biodiversity measures through stakeholder involvement. Nevertheless, the technical

and complex nature of biodiversity issues limits the population of respondents knowledgeable enough to contribute to large-scale quantitative studies.

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