



Mainstreaming biodiversity in economic sectors: An analytical framework



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ABSTRACT

One of the major challenges in halting biodiversity loss is finding ways to address the issue in places where it would matter most; in the economic sectors of society that exert the strongest pressures on biodiversity such as agriculture, forestry and fisheries. Governments have acknowledged the need for this so termed mainstreaming under the Convention on Biological Diversity, but in practice have made little progress and struggle to find ways forward. In this paper we argue that the concept of mainstreaming was originally developed for situations where governments or intergovernmental organizations with explicit public mandates took the lead, but it is increasingly extended into various governance contexts where multiple types of actors at different levels (could) engage in conserving biodiversity. This paper aims to enable the identification of innovative repertoires of mainstreaming opportunities that optimally and realistically benefits from the broader governance context. Therefore it presents a framework, consisting of institutional, motivational and means dimensions for identifying key barriers and levers for mainstreaming biodiversity into economic sectors. By applying the framework on the forestry sector we show that it does not only help to identify new mainstreaming opportunities but it also shows directions for improving existing schemes as well.

1. Introduction

One of the major challenges in halting biodiversity loss is finding ways to address the issue in places where it would matter most; in the economic sectors of society that exert the strongest pressures on biodiversity such as agriculture, forestry and fisheries. Efforts to integrate a 'new' issue in a sectors that have not systematically addressed it have often been referred to as mainstreaming. In 2010 the need for mainstreaming in the field of biodiversity was recognised by the Convention on Biological Diversity (CBD) – captured explicitly in two of the five strategic goals in the Strategic Plan for Biodiversity 2010–2020: (CBD, 2010b)

- ✓ Strategic Goal A: address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society
- ✓ Strategic Goal B: reduce the direct pressures on biodiversity and promote sustainable use.

Mainstreaming became a central theme at various of CBD's Conferences of the Parties (COP) hereafter.

Mainstreaming is a popular concept used both in the academic analysis of policy, but perhaps even more in policy agendas and programs. It involves taking a specific objective of one issue domain and declaring that this objective should be integrated into other issue domains where it is not (yet) sufficiently addressed (Cowling et al., 2008; Nunan et al., 2012). In the political context it has been applied particularly for issues that have emerged as legitimate concerns against an earlier, to some extent conflicting policy context, such as environment in the broad sense, climate change (mitigation and adaptation), gender and human rights. The concept of mainstreaming was first used in the European Union as a policy instrument for the operationalization of 'the integration principle' in the environmental policy domain (Halpern et al., 2008).

An underlying rationale for promoting a strategy of mainstreaming biodiversity or broader environmental issues is the realisation that the causes of the problem in question lay within the remit of other policy domains or economic sectors. In the case of biodiversity it is clear that a sole focus on conservation policies (like in-situ, ex-situ conservation and limiting trade in endangered species) will have only limited impact in reducing biodiversity loss. It is in sectors such as agriculture, forestry,

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fisheries and aquaculture, mining, water management and energy production where the activities take place that drive biodiversity loss and towards which measures need to be targeted (Spangenberg, 2007), and thus where it would be important to mainstream biodiversity concerns (Marques et al., 2014).

However, mainstreaming biodiversity into economic sectors is not an easy process and progress has been slow or non-existent (Huntley and Redford, 2014). A majority of countries who have developed their National Biodiversity Strategy and Action Plans (NBSAPs) under the CBD find the mainstreaming of biodiversity into economic development to be a considerable challenge (Leadley et al., 2014).¹ There are multiple reasons for why it has proved to be so challenging to mainstream biodiversity into economic sectors including lack of knowledge and volition among those (inter)governmental actors that make policy in these sectors. The starting assumption for this paper is, however, that one part of the reason is the dominant focus on government led initiatives and the limited attention to the broader contexts of governance - with its diversity of actors and modes of steering - that are a common characteristic of these sectors. Better identification of opportunities for mainstreaming biodiversity in economic sectors requires an understanding of how and by whom such sectors are governed that moves beyond the governmental view of steering.

Over the past decades, the shift from government to governance has become the key concept denoting how contemporary steering of and in society works. Governance has numerous definitions, most of which share the elements of multiple types of stakeholders being involved and diverse mechanisms of steering being used at multiple sites and levels, resulting in a polycentric governance landscape (Lafferty, 2004; van Kersbergen and van Waarden, 2004). Governance poses fundamental challenges to understand what 'steering' and 'managing change' might imply in such diffuse, complex and multi-level networks that are characterized by for example more self-organization and diverse leadership (Pahl-Wostl, 2009) compared to top-down steering by governmental actors. This is not to say that governments do not have to play a role in the context of governance, but rather that they have to take into account this changing context and adjust their repertoire to make best use of the diversity of stakeholders that are involved and the variety of steering mechanisms that can be applied.

This paper aims to enable the identification of an innovative repertoire of mainstreaming opportunities that optimally and realistically benefits from the broader governance context. We argue that this requires a systematic analysis that will be enabled by a framework that: 1) draws on theories and experiences of governance; 2) identifies barriers and levers in a specific governance context; and 3) supports the identification of promising opportunities for mainstreaming of biodiversity. The main objective of this paper is to develop such a framework and illustrate its usefulness. The paper proceeds in the following steps. In the following (Section 2) we provide a brief overview of the literature on biodiversity and environmental mainstreaming with particular attention to trends that are relevant for mainstreaming biodiversity in contexts of governance. Next, we present our framework for mainstreaming biodiversity in governance contexts that draws on relevant social science and governance theory (Section 3). Then follows an illustration of how the framework can be used by applying it to the case of mainstreaming biodiversity in the global forestry sector through international certification schemes (Section 4). Finally we discuss some implications of the approach and draw some conclusions (Section 5).

2. Mainstreaming – from government led to governance contexts²

In this section we briefly describe the concept of mainstreaming and

its linkages to similar concepts and provide an overview of the literatures on biodiversity and environmental mainstreaming and the identification of some trends that are relevant for analysing the opportunities for mainstreaming biodiversity into economic sectors. This overview is based on a restricted literature review using the major databases including Web of Science and Scopus using search words as mainstreaming and integration combined with governance, environment, biodiversity and ecosystem services.

Mainstreaming is related to other concepts, such as environmental policy integration (EPI), interplay management and policy coherence, all strongly based in public policy sciences. Mainstreaming indicates a unidirectional movement of putting one issue more centrally on the agenda of another particular policy domain. Integration is interpreted in various ways, with some authors (Lafferty and Hovden, 2003) taking a principled priority position in which environment takes priority to other issues. Other authors regard policy integration as a more bidirectional process of merging the concerns of two domains (see for an overview (Jordan and Lenschow, 2008)). Interplay management usually implies pursuing collective objectives through conscious efforts by one or more actors to address and improve the interactions and effects of institutions (Oberthür and Stokke, 2011a). Finally, policy coherence describes a situation of synergy between different policy areas (Mickwitz et al., 2009) as well as an ability to deal with trade-offs and can be understood as the aim of policy integration or mainstreaming.

Specific literature on mainstreaming biodiversity emerged in the 2000s (see below) and onwards building conceptually on the literatures on mainstreaming environmental issues and climate change. Those literatures have, among other themes, provided insights on what factors make mainstreaming effective in government dominated contexts whether in: specific countries (Nunan et al., 2012; Roux et al., 2008), EPI in the EU (Gupta and Grijp, 2010; Jordan and Lenschow, 2008; Nilsson and Nilsson, 2005); donor and government driven contexts in developing countries (Kok et al., 2008; Persson, 2009; Snyder et al., 1996); or in international organizations and international policy domains (Kok and de Coninck, 2007; Oberthür and Stokke, 2011b). This literature has over time been further strengthened with efforts towards more systematic and conceptual elaboration (Runhaar et al., 2014) and empirically oriented studies on national or local mainstreaming implementation efforts both in developing and developed countries (Pasquini et al., 2015; Sietz et al., 2011; Wamsler, 2015), also addressing the question how to embed climate change adaptation in biodiversity conservation (Burch et al., 2014). Over time an emergent theme in this literature has addressed mainstreaming, for example of climate change adaptation, in contexts of governance (Butler et al., 2016).

The literature that focuses specifically on the mainstreaming of biodiversity looks at this issue in various production landscapes and sectors (Cowling et al., 2008); international policy domains (Kok et al., 2010), development planning and poverty reduction and national policies (Huntley, 2014), while overall lessons are drawn in Huntley and Redford (2014). The increasing attention to the concepts of ecosystems services and natural capital has provided a special impetus to the literature on mainstreaming biodiversity as these try to operationalise the benefits from nature for humans. One could distinguish between literature that focusses on mainstreaming ecosystem services conceptually in a more general sense (Greenhalgh and Hart, 2015; Guerry et al., 2015), the mainstreaming in specific policy domains such as climate change and disaster reduction, development planning and poverty reduction, water, agriculture and recreation (Pasquini and Cowling, 2015; Plieninger et al., 2012; Reyers et al., 2015), in specific policy frameworks such as landscape planning (Albert et al., 2014; Sitas et al., 2013) and municipal planning (Wamsler et al., 2014), and in cross-cutting policy tools such as (strategic) impact assessment (Kumar et al., 2013), accounting (Siddiqui, 2013) and environmental appraisal (Gazzola, 2013).

¹ See also Frenzt (2006) quoted in Chandra and Idrisova (2011).

² This section draws partly on Karlsson-Vinkhuyzen et al. (2014b).

A few trends can be seen in these literatures that are relevant for our interest in mainstreaming biodiversity in contexts of governance in economic sectors. Many of the articles included in the review:

- a) tend to assume that mainstreaming needs to have a strong element of steering, initiated and led by government(s);
- b) often neglect to link theoretical approaches and understandings around how governance across the public-private boundaries, in networks etc. works in practice;
- c) depart from the rationale of the issue that should be mainstreamed (e.g. biodiversity) rather than from the rationalities of the sector/policy arena into which it aims to be mainstreamed;
- d) identify as essential for mainstreaming factors such as institutionalised coordination mechanisms, top-down leadership, national laws, normative agreement (united visions), coherent norms and regulatory tools, funding, and participation, transparency and democratic accountability in the mainstreaming process.

Taken together this illustrates that comparatively less attention has been given in these mainstreaming literatures to the contexts of what [van Kersbergen and van Waarden \(2004\)](#) refers to as ‘governance in and by networks’ both within the private (market) and public (governmental) sphere that we assume are a prevalent feature in those economic sectors where increased concern for biodiversity would matter most. This means that more traditional governmental oriented analysis of mainstreaming may miss strategies that fit into a governance model of steering such as: efforts by business to include biodiversity in their operations in order to minimize impacts and capture the opportunities of natural capital; the inclusion of biodiversity in voluntary standards for sustainable production of agro-commodities and forest or fisheries management; considering biodiversity as a risk factor as well as an asset by the financial sector; and integrated landscape management by multi-stakeholder platforms ([Kok et al., 2014](#)).

3. A framework for assessing the opportunities for mainstreaming in governance contexts

We here propose a framework ([Table 1](#)) that could serve as an analytical tool to pay more systematic attention to specific contexts of governance for mainstreaming biodiversity in economic sectors and thereby enable the identification of a broader repertoire of potential opportunities. The framework thus has a diagnostic purpose, see for example [Pahl-Wostl \(2009\)](#) and [Burch et al. \(2014\)](#), and can be used for research purposes, but was also developed with the possibility of advising actors seeking to promote the integration of biodiversity in economic sectors in mind. Considering that the governance research field is immature and its literature highly heterogeneous with low levels of theoretical consensus, low levels of methodological consensus and highly variable patterns of operationalization we could not aim for developing a model but rather an analytical framework as a heuristic tool. Drawing on our own networks of governance researchers we used expert review and expert consultation and through this identified three key dimensions and ten sub-dimensions of governance that are important for covering the governance contexts in economic sectors.³ Firstly, the institutional structure of a sector guides the acts and interactions of actors. It includes vertical and horizontal interactions, policies and norms. Secondly, the motivational structure underlies the drivers for behaviour and behavioural change. It includes values, interests, framing and leadership. Thirdly, the distribution of means

³ The identification of barriers and levers can be considerably more complex than what we consider here. For example, [Biesbroek et al. \(2014\)](#) showed how the choice of analytical lens on governance - as problem-solving, competing values and interests, institutional interaction, or dealing with structural constraints - influenced what type of issues were identified as barriers, in their case for climate adaptation.

structures interdependencies and the range of alternatives. It includes knowledge, time, and financial resources. Important to note is that the sub-dimensions are not mutually exclusive, for example, leadership that can also be seen as a resource.

The dimensions and sub-dimensions are further described briefly below. Again based on expert review and consultation we identified examples of theoretically suggested or empirically identified factors that can provide barriers or levers for mainstreaming in each of the sub-dimensions. These factors are also summarised in [Table 1](#) below. When applying this framework in the analysis of a particular economic sectoral governance contexts one would look for the existence of any of the barriers and levers mentioned. This will enable the identification of realistic mainstreaming opportunities that benefit from the existing governance context of an economic sector as we illustrate further below with the case of forestry.

3.1. The institutional dimensions

The institutional dimensions of governance encompass diverse formal and informal rules, organizations, and norms and policies and that guide interactions in a certain economic sector. In a context of governance, as opposed to government, interactions will often be built on dynamic multi-stakeholder processes, characterized by hybrid modes between bottom-up and top-down, networks and hierarchy, controlled and self-organizing. Therefore we distinguish between horizontal interactions, vertical interactions and norms.

3.1.1. Horizontal interactions

In general, interactions in contexts of governance are more horizontal and less hierarchical. Examples include interactions within and between public-private, hybrid or multi-stakeholder partnerships (such as the Roundtables of Sustainable Palm-Oil or the Marine Stewardship Council) or among largely independent international sectoral regimes — for example trade (WTO) and environment (e.g. UNEP and various Multilateral Environmental Agreements) where there is no shadow of hierarchy. The presence of horizontal interactions provides important entry points to understanding the governance of a particular issue or sector. A weaker presence of hierarchy, as in the case for international environmental governance involving for example institutions of the CBD and the UN Framework Convention on Climate Change, could be a barrier, as it does not enable the solution of inter-institutional conflicts and policy conflicts ([Oberthür, 2009](#)). Resistance towards ‘new’ modes of governance among public managers rooted in e.g. conflicting convictions of what is good policy making, stereotyping potential partners, a specific framing of a situation, or the fear of undermining existing policies, could also dominate an economic sector and be a constraint for experimenting with more horizontal interactions as [Termeer \(2009\)](#) showed for cases in sustainable agriculture. Similarly, the principle-agent theory leads to the expectations that actors who lack autonomy because they are tied in a principal agent relationship have higher resistance towards initiating global public-private partnerships for the environment ([Andonova, 2010](#)).

Possible levers can also be identified. Public managers' resistance towards horizontal modes of governance could be broken by organizing reflections, creating new contexts and recognizing small wins ([Termeer, 2009](#)). The coordination among intergovernmental agencies could be enabled by horizontal structures ([Oberthür, 2009](#)). Another example is the creation of (public-private) partnerships that are a common phenomenon characterizing governance efforts on sustainability issues ([Andonova, 2010](#)). Yet another example is catalytic alliances, a type of temporary network organizations initiated to create long-term social change through media-based campaign efforts to generate public awareness and commitment to action [Waddock and Post \(1995\)](#) quoted in [Austin and Seitanidi \(2012a\)](#). Conditions or active measures that open up patterns of resistance or strengthen alliances and partnerships around the issue that needs to be mainstreamed, in our case biodiver-

Table 1
Analytical framework for identifying potential barriers and levers for mainstreaming biodiversity in contexts of governance.

Governance dimensions and sub-dimension		Examples of barriers	Examples of levers
Institutional	Horizontal interactions	<ul style="list-style-type: none"> – Resistance towards more horizontal modes of governance among public managers due to a variety of factors – Low autonomy of actors – Low degree of trust among dispersed group of actors 	<ul style="list-style-type: none"> – Organizing reflections, creating new contexts and recognizing small wins among public managers – Horizontal structures for coordination – Catalytic alliances (networks focused on awareness raising) – Active management of trust formation among actors – Track record of collaboration among actors engaging in a partnership
	Vertical interactions	<ul style="list-style-type: none"> – Mismatches between levels where drivers for problems exist and levels where there are actors with capacity and legitimacy to create institutions 	<p>The presence of enabling conditions for rescaling and scale sensitivity such as:</p> <ul style="list-style-type: none"> – Flexible institutions to create and recreate fit between problem and governance arrangements; – Tolerance for redundancy and blurred responsibilities – A vertically integrated commodity chain enabling partnership formation
	Policies and norms	<ul style="list-style-type: none"> – Low compliance with voluntary agreements – High density of pre-existing norms making it difficult to develop new ones 	<ul style="list-style-type: none"> – Low density of pre-existing norms creating space for new policies and norms – Development of commitments and standards by private or hybrid actors – Strong accountability regimes for norm implementation involving multiple actors – Adapting strategies for changing different types of norms (operational types of rules for fast change – constitutional type of rules for enduring change)
Motivational	Interests	<ul style="list-style-type: none"> – Dominant incentive disappears causing motivation loss – Basic interests are not fulfilled for key actors 	<ul style="list-style-type: none"> – The presence of actors who have linked interests and whose interests are also linked to the environmental issue to be mainstreamed – Reciprocal mainstreaming – Combination of pressure on companies from campaigning NGOs and outreach from collaborative NGOs – Pressure on IOs from outside (NGO lobbying) or inside (budgetary constraints) to forge partnerships with non-state actors
	Values	<ul style="list-style-type: none"> – Narrow utilitarianism and absence of altruism among key actors 	<ul style="list-style-type: none"> – Presence of inclusive and ‘expanded’ value spheres among relevant actors
	Framing	<ul style="list-style-type: none"> – Controversy from too divergent frames 	<ul style="list-style-type: none"> – A process of frame fusion – Plurality of frames can enable co-creation in partnerships – Presence of alternative frames and active reframing
	Leadership	<ul style="list-style-type: none"> – Reliance on positional leadership alone 	<p>Leaders that can:</p> <ul style="list-style-type: none"> – foster adaptation (innovation and experimentation) – embrace disequilibrium (create a culture of courageous conversations) – generate leadership (mobilize everyone to generate solutions) – provide normative direction – enhance diversity in skills, cultures, passions and interests – provide moral leadership
Means	Knowledge	<ul style="list-style-type: none"> – lack of knowledge on biodiversity promoting measures – lack of clear business case (economical evidence) – lack of measurable targets and indicators for issue to be mainstreamed 	<ul style="list-style-type: none"> – Tools such as Strategic Environmental Assessments or collaborative mapping at landscape level – Goals, targets and indicators that are easy to communicate and that show the linkages between natural capital and human well-being
	Time	<ul style="list-style-type: none"> – Mismatching cost-benefit timescales among actors – Short-term needs for livelihoods or profit constrain long-term policy horizons 	<ul style="list-style-type: none"> – Individuals in key positions with long-term commitments for collaboration – Scenario development processes that can visualize long-term dependence on biodiversity
	Financial resources	<ul style="list-style-type: none"> – Reliance on biodiversity specific public funds alone 	<ul style="list-style-type: none"> – External (public) support for expanding planning time horizon – Increased understanding of the socio-economic value of biodiversity – Availability of innovative finance mechanisms

sity, would be potential levers. This can include a positive attitude towards reflection and learning, a track record of collaboration among actors engaging in a partnership as [Austin and Seitanidi \(2012a\)](#) concluded based on a focused review of non-profit business and Corporate Social Responsibility literature, or examples of active strengthening of trust among the actors in a sector as [Glasbergen \(2011\)](#) argues in his theoretical model for developing partnerships for sustainable development ([Glasbergen, 2011](#)).

3.1.2. Horizontal interactions

The dimension of *vertical interactions* focuses on interactions across multiple levels, including, but also beyond hierarchical settings, see for example, [Marks and Hooghe \(2005\)](#) and [Scharpf \(1997\)](#) who discusses this primarily in the context of European governance. In ‘multilevel governance’ actors may bypass hierarchy, for example when local authorities directly lobby the EU or where national NGOs or local authorities engage in global governance arenas for the issues they care about. The interactions among actors at different levels raise issues of how to allocate responsibility as [Karlsson \(2007\)](#) argues drawing on

broader literature on global poverty governance, that, if not dealt with appropriately, may block the emergence of multilevel governance arrangements. Mismatches between levels where drivers for biodiversity loss exist, and those where actors with capacity and legitimacy to establish institutions are present, can become considerable barriers towards integrating an issue across levels of governance as Karlsson (2000) illustrates based on research on pesticide governance in developing countries from the global to the local level. Termeer et al. (2016) show, based on cases on governance of adaptation to climate change, that the ability to address such mismatches – also referred to as rescaling – is a potential lever. Rescaling has close affinity with scale sensitivity which implies institutions that are flexible for overlaps (redundancy) and blurred responsibilities among actors at different levels as Termeer and Dewulf (2013) argues conceptually drawing on a broad set of governance literature. The presence of a vertically integrated commodity chain where a few actors have the authority and capacity to, for example, form partnerships is another potential lever in certain conditions in the agricultural sector (Vermeulen et al., 2008) although it could also be a barrier. Another one can be international norms (see below) that diffuse and influence not only states but also non-state actors such as businesses and NGOs at different levels or policy relevant knowledge that is integrated from local to global scale (see below).

3.1.3. Norms and policies

The concept of norms refers to standards for appropriate behaviour (Finnemore and Sikkink, 1998). Policy is also a concept with a broad connotation, mostly referring to a course of action or a plan or a “rationale, a manifestation of considered judgment” (Parsons, 1995), and thus, similar to norms, aims to direct behaviour. For economic sectors norms and policies can cover a considerable span from international treaties and national standards and regulations to social conventions in a local community, and from voluntary industry targets and Corporate Social Responsibility (CSR) norms of companies to the social norms guiding consumers in their purchasing choices. And while policy is often implicitly associated with public actors, in governance contexts it is important to identify policies and norms developed by both public and private actors, because they provide a basis on which they operate. Governance is often associated with more voluntary norms, that can imply barriers for mainstreaming through low compliance and limited possibilities for sanctions as a review of the literature on different types of international norms shows (Karlsson-Vinkhuyzen, 2011). Governance contexts with high density of constraining norm and policies – such as widespread subsidies for agricultural investments and systems that harm biodiversity (Scherr and McNeely, 2008) – can also provide a barrier for developing new norms on an issue not previously addressed in the sector, such as biodiversity (Karlsson-Vinkhuyzen and Kok, 2011). Opportunities, on the other hand, can be found if there is a low density of norms, and thus providing space for integrating new norms as Karlsson-Vinkhuyzen and Kok (2011) shows based on analysis of several cases in global environment and development governance or if there are strong accountability regimes for norm implementation involving multiple actors as can be argued for international environmental law such as the recently adopted Paris Agreement (Karlsson-Vinkhuyzen, 2015). One example of new norms are the various forms of certification standards have been developed by private or hybrid actors for various products such as timber, fish, palm oil (see below). Levers can be found by identifying those norms that are most amendable to change in the short term (operational types of rules) and long term (constitutional types of rules) as Kiser and Ostrom (1982) argues in their synthesis of institutional approaches and adopting strategies for mainstreaming to these. The presence of global or regional norms in support of integrating an issue into economic sectors can be particularly important levers when local and national interest or capacity is limited as Karlsson-Vinkhuyzen et al. (2012) showed drawing on literature on the principle of subsidiarity applied to the case of energy.

3.2. The motivational dimensions

Mainstreaming has always been conceptualized as a conscious strategy initiated by actors who seek to strengthen a certain issue on the agenda of relevant actors and institutions (Nunan et al., 2012). But even in the context of governmental steering such processes have few ways to ‘enforce’ the uptake of a new policy item, and uptake strongly depends on encouragement and positive incentives, unless there is a strong degree of inherent motivation among actors for the issue in question. The often lower degree of ‘power’ of hierarchy in contexts of governance (although there can be a prevailing inequality of power also in these contexts) makes the motivational dimensions even more important for initiatives to emerge. It includes the interrelated elements of interests, values, framing and leadership.

3.2.1. Interests

Interests are important drivers of behaviour. The mainstreaming of an environmental issue into other sectors will face the obstacle of entering a governance arena where all other vested interests have the privilege of ‘being first’. Putting a new issue such as biodiversity on an already established agenda is challenging (Karlsson-Vinkhuyzen and Kok, 2011) as it happens within a specific context that is hard to change because of all kinds of path-dependencies. Burch et al. (2014) highlight with a case study on integrating climate adaptation in biodiversity conservation the importance of making sure that biodiversity links to the interests of the actors who need to mainstream. The latter is in biodiversity mainstreaming coined ‘reciprocal mainstreaming’ (IIED and UNEP-WCMC, 2015) and is getting closer to integration and policy coherence.

Tang and Tang (2014) show with a study of land and ecological conservation in Taiwan that well intended public policies aimed at steering actors in a conservation direction can suffer from the ‘crowding out’ effect, where individuals loose motivation when the dominant incentives (such as financial rewards) disappear. Furthermore, if individuals’ fundamental interests are not satisfied they can become unresponsive to other incentives – also referred to as ‘hierarchical exclusion effects’ (Tang and Tang, 2014). On the other hand the presence of actors who have linked interests and whose interests are also linked to the environmental issue to be mainstreamed gives a signal of high potential for creating synergistic value from mainstreaming (Austin and Seitanidi, 2012a). One example are farmers and their communities who, against common assumptions, often have strong (long term) economic and social reasons to support biodiversity conservation as various studies show (Scherr and McNeely, 2008). External and internal pressure can make actors take on sustainability e.g. through forming partnerships. For companies it could be a combination of campaigning NGOs that put pressure on a company and collaborative NGOs reaching out to support new more sustainable outputs (Glasbergen, 2011). For International Organizations (IOs) budgetary constraints or pressure from non-state actors and the public that question the effectiveness or legitimacy of the IOs can push them towards creating new partnerships (Andonova, 2010).

3.2.2. Values

Values is a broad concept and we here confine it to those things that are considered essentially good by individual or collective actors (Graham, 1981). Values can of course be closely linked to interests (see above), but tend to relate more to the fundamental perspectives on life and often have their origins in upbringing and social and/or religious contexts. Also, which values are seen as most important can change over time. Studies by Inglehart (1999) show that in industrialised countries, where most people do not face basic survival issues, a pattern of systematic change can be observed in the last decades of the 20th century towards so-called post-materialist values. Values relevant as motivation for initiating actions to mainstream biodiversity in sectors can be, among others, eco-centric (looking at the intrinsic value

of species and nature) or anthropocentric (looking at the value of ecosystem services for humanity). The literature on CSR shows that initiatives such as engaging in partnerships for sustainability are motivated by a mix of altruism and utilitarianism (Austin and Seitanidi, 2012b). Thus the absence of any elements of valuing biodiversity beyond a narrow self-interest should make mainstreaming more challenging. On the other hand the identification of actors with wider value spheres, such as other species and the biosphere as a whole, would provide opportunities (Karlsson, 2000).

3.2.3. Framing

Framing can be understood as a process by which issues, decisions or events acquire different meanings from various perspectives (Dewulf et al., 2011). Frames provide strong and generic storylines that guide both analysis and action in practical situations (Schön and Rein, 1994). Actors from different backgrounds may construct frames that vary significantly from each other, stressing some aspects of an issue at the expense of others and drawing different issue boundaries. Frames determine not only the proposed solution strategy, but also single out different roles of stakeholders and distribute power (Hajer, 2011). The presence of very diverse frames in a governance contexts can lead to confusion, misunderstanding, disagreement or even intractable controversy argue Schön and Rein (1994) in their theoretical analysis and this can then form an obvious barrier for mainstreaming. Brummans et al. (2008) further highlight, drawing on four cases of environmental disputes in USA, that one should not to automatically cluster stakeholder groups together as homogenous groups because individuals with similar experiences may still make sense of these differently and construct diverse frames of an issue.

Moreover, individuals' and institutions' frames are dynamic and can be actively influenced. An example is deliberate fusion or connecting of frames. This can take place through a process where each partner sees the strategic direction of each other's decisions, participates in interactions involving multiple actors and observes organizational change processes, and monitors and interprets each other's frames (Austin and Seitanidi, 2012a). In practical terms this can be through a facilitated face-to-face interaction among experts and other actors (Dewulf et al., 2011). Purposefully framing or reframing an issue can be another opportunity for promoting change, for example by scientists using different variations of ecosystem service frames to facilitate collaborative behaviour in landscape planning suggests Opdam et al. (2015) or by the CBD Secretariat reframing biodiversity "from a passive recipient of climate impacts to an active player in addressing the climate change problem" (Jinnah, 2011: 24).

3.2.4. Leadership

Leadership that is able to initiate the kind of change that mainstreaming needs involves various functions and implies a set of capabilities. In contexts of governance leadership needs to go beyond single activities and traditional positional ideas tied to individuals argues Uhl-Bien et al. (2007) in their paper developing a framework for Complexity Leadership Theory. Complexity leadership needs to perform administrative, adaptive and enabling functions in order to support innovations required for mainstreaming biodiversity (Termeer and Nooteboom, 2012). The administrative function focusses on order and is tied to hierarchy and access to resources, the adaptive function develops suggestions for change without using power over others and the enabling function helps others to creatively solve problems and learn (Uhl-Bien et al., 2007). Moreover, providing normative direction is important (Burch et al., 2014). Other theories identify what capabilities individual leaders need to have when many actors need to collaborate for a common goal. Allen et al. (1998) in their conceptual elaboration of 'ecological' leadership suggests that one example of such a capability is being able to share responsibility among all participants, another is enhancing diversity in skills, cultures, interests, and passions. The presence of such capabilities could thus provide levers for main-

streaming, as would, according to Heifetz et al.'s (2009) study of corporate sector leadership in rapidly changing environments, the ability of leaders to foster innovation and experimentation, create a culture of courageous conversations and mobilize everyone to generate solutions. The personal values of individual leaders also matter argues Vinkhuyzen and Karlsson-Vinkhuyzen (2014) in their comparison of three different leadership frameworks, particularly valuable is the presence of moral leaders – leaders who have the ability to inspire sustained efforts for the necessary changes, as well as create a willingness to assume the personal risks inherent in dealing with resistance to change, see WHO (1988) quoted in Anello and Hernández (1996).

3.3. Means

A lack of means, or resources, can be a barrier in any context where mainstreaming is attempted but can also in some circumstances act as a lever for new interdependencies and sharing of resources, see for example Andonova (2010). Resources can include tangible ones (e.g. money, land, facilities, machinery, natural resources) and intangible ones (e.g. trust, knowledge, capabilities, management practices, and skills) (Austin and Seitanidi, 2012a). When a new issue is being integrated in existing policy domains, access to knowledge about the topic may be limited, human and financial resources are already heavily committed, and incorporating a different planning horizon may add unwanted complexity. Contexts of governance can, however, provide a greater diversity of actors, which implies more diverse potential resources as we can see from examples below in the three categories of means; knowledge, time and financial resources.

3.3.1. Knowledge

Knowledge, whether scientific or experience based, on a variety of issues can be relevant for mainstreaming biodiversity. For example, actors need to have a sound basis for identifying which of their activities contribute to biodiversity loss or conservation, but they also need to know how to collaborate and initiate change. Lack of knowledge can thus be a significant barrier. The same applies for uncertainties and knowledge gaps, such as making a business case for mainstreaming nature-based solutions suggests Ojea (2015) based on a review of literature on eco-system based adaptation. Other barriers can be (non) measurable benefits from the environment that are not included in project or program objectives as argued by Persson (2009), based on a review of the effectiveness of integrating environmental issues into development assistance, or the challenge of "actionable, easy-to-communicate goals, targets, and indicators that include connections between nature and human well-being" as Guerry et al. (2015:7354) concludes in their assessment of progress in the inclusion of natural capital in decision-making.

Strategic environmental assessments can provide opportunities to highlight biodiversity concerns and identify opportunities that the ecosystem services can provide (Kumar et al., 2013; Rega and Spaziante, 2013). Another opportunity could come from collaborative mapping of such services at landscape level suggest Opdam et al., (2016) based on a literature review on the role of information for landscape governance. A governance context with its large diversity of actors also brings more varied knowledge that provides considerable potential for learning and ideas as well as openings for co-production of knowledge.

3.3.2. Time

Time in the context of governance has many facets beyond being an often scarce resource for busy actors. It includes the dominant time-horizon (in terms of planning and policy) of the major actors in a sector and the time dynamics around major governance processes (such as an international treaty or a multi-stakeholder certification system). Considerable diversity in planning horizons among governance actors is likely to be a significant barrier if cost-benefit timescales mismatch

(Ojea, 2015). Chandra and Idrisova (2011) highlight, based on their review of implementation of the CBD, that it is often the maximisation of short-term livelihood needs or profit requirements in production sectors that limit the incorporation of biodiversity principles into sectorial development and resource extraction plans. Integrating biodiversity requires considerably longer planning and action horizons within organizations. A study on the economics of ecosystems and biodiversity proposed that linking short and long term horizons could be supported for example by scenario exercises that make the value of biodiversity visible for the long-term interest of actors, or for external (public) support for longer planning horizons (TEEB, 2009). The presence of individuals in key positions that prioritize long-term commitments is an important lever for the collaboration as shown by Rondinelli and London (2003) in their study of cases of collaborations between corporations and environmental non-profit organizations.

3.3.3. Financial resources

Financial resources, the availability and flow of monetary sources, are of course a crucial factor influencing incentives and possibilities for action. In the case of biodiversity two different types of funding can be distinguished, namely dedicated support to biodiversity under a distinguished budgetary heading, and sectoral resource mobilization (Kettunen et al., 2013). The first category of public funding (special biodiversity funds under the CBD, national funding etc.) is the ‘traditional route’. Few countries have elaborated finance strategies that would bring biodiversity objectives and sectoral development together (CBD, 2010). The mobilization of resources from various domestic and international public and private actors in an economic sector can be leveraged by increased understanding of the benefits and (socio-economic) value of biodiversity.

Sectoral mobilization can be aided with the help of ‘innovative finance mechanisms’ including Payments for Ecosystem Services (PES), biodiversity offsetting, green taxation, markets for green products, certification of production and production regions, and integrated biodiversity and climate funding. Kok et al. (2014) suggest in their study for the CBD Secretariat and fourth Global Biodiversity Outlook that these mechanisms could result in an increase in private funding for biodiversity to complement existing public funding, and would be a key lever for mainstreaming within production sectors themselves.

4. Illustrating the application of the framework – the forestry sector

In this section we illustrate the application of the framework in the global forestry sector, defined as all economic activities that mostly depend on the production of goods and services from forests. The illustration is based on desk research, see Visseren-Hamakers and Podvin (2014). Forests, especially tropical forests, are some of the richest biological systems on earth, and forests – and their biodiversity – are under severe threat in many parts of the world as a result of deforestation, forest degradation, climate change and other stressors (Kok et al., 2014). Unsustainable logging is one of the major causes of tropical deforestation and degradation (Geist and Lambin, 2002; Sierra, 2001), and illegal logging is a major problem worldwide (Dooley and Ozinga, 2011).

We focus our analysis on the two major international standards for forest certification, the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), which can be seen as potential contributions to mainstreaming biodiversity in the forestry sector. The analysis includes two perspectives on mainstreaming, first how the standards have mainstreamed biodiversity aspects in their own practices – *mainstreaming in forest certification*, and second how they contribute to the mainstreaming of biodiversity in the forestry sector – *mainstreaming through forest certification*.

4.1. Institutional dimensions

4.1.1. Vertical and horizontal interactions

We have integrated the analysis of barriers and levels in *horizontal and vertical interactions*. There are many actors at different levels that play a role in the governance of forests through certification. At the global level different governments are known to support different certification schemes and the perspective on Sustainable Forest Management (SFM) that they represent. NGOs have played a very important role in the development of the FSC, which is a membership-based organization established in 1993 as a private partnership between industry, social groups and environmental groups. The PEFC was created in 1999 as an international non-profit organization promoting SFM, and is a global umbrella organization of national forest certification schemes. Most NGOs prefer the FSC to the PEFC, while forest owners’ associations and many members of the forest industry favour the latter.

Both FSC and PEFC schemes work at the global and national/regional levels. The FSC has one global standard that includes principles and criteria that are operationalized into specific regional or national standards, while the PEFC endorses different national standards; hence, its standards can vary across countries and regions. Governments can support forest certification through their procurement policies, certifying their own forests, and supporting the development of certification standards (Gulbrandsen, 2006; Sprang and Meyer-Ohlendorf, 2006). Other forest product buyers, including professional and household consumers, are also important actors for achieving a larger market share for certified forest products. On the production side, forest owners and managers are the key actors with the choice to apply for certification (thereby increasing the area under certification), choosing a certification scheme (and the criteria they include), and following through on its implementation (thus ensuring e.g. conservation of biodiversity through improving their forest management), although the capacity to implement certification varies across countries.

4.1.2. Policies and norms

Forest certification in essence entails the voluntary adoption by forest managers of certain standards (rules and norms) on how a forest should be managed, in exchange for a label. In terms of *mainstreaming in forest certification*, the degree to which certification can address biodiversity loss is partly related to its inclusiveness and stringency, and the compliance of those standards (Gulbrandsen, 2005a), with inclusiveness referring to the question whether all issues relevant to SFM are addressed by a scheme, and stringency to the level of ambition of the demands on a specific issue. Overall, attention for biodiversity concerns has been integrated into both standards, and the FSC and PEFC standards overlap in several aspects. However, there are also large differences between the schemes, as well as different standards within each umbrella scheme (Cashore et al., 2004).

There is an ongoing (academic) debate on the comparison of the two standards. There are some studies that suggest that FSC has a more stringent and inclusive standard than the PEFC (Gulbrandsen, 2005b; McDermott and Cashore, 2008), with some authors stating that FSC has more ‘checks and balances’ in place to keep inconsistencies at a minimum while providing clear assurance of performance and evidence of its impacts on forest management (Sprang and Meyer-Ohlendorf, 2006). Others argue that the PEFC might have a negative influence on biodiversity governance, because of its less stringent and inclusive standard as compared to the FSC, enabling forest managers to choose for a less ambitious sustainability scheme (Visseren-Hamakers, 2013). Other questions raised include whether the differences between the standards are becoming smaller because of the ongoing competition between the two schemes, with some highlighting efforts to close the gap between both schemes (Overdevest, 2005). The standards could thus be involved in a ‘race to the bottom’ or a ‘race to the top’, influencing the potential to contribute to biodiversity mainstreaming of

both schemes.

We analysed two national cases to illustrate examples of norms and policies of the FSC and PEFC, and the extent to which they are including concerns for biodiversity; the FSC Bolivian Standards for certification of forest management of timber-yielding products in the low lands of Bolivia ((CFV, 1998), and the PEFC-endorsed CERTFOR from Chile for natural forests (PEFC, 2007). They were selected since they are both operating in the South, on the same continent, and in important countries for biodiversity conservation. The comparison showed that the Bolivian FSC standard (not considering implementation) mainstreams biodiversity more elaborately and specifically than the Chilean PEFC standard (see for further details Visseren-Hamakers and Podvin (2014)). Of course this comparison cannot be generalized to global conclusions on the differences between the two standards.

Both schemes have contributed to *mainstreaming through certification*. There has been a relatively rapid growth of the certified area since the inception of both schemes. From 2010 to 2011 there was an increase of 4%, and from 2011 to 2012 and increase of 9%. As of September 2016, over 190 million hectares were FSC-certified worldwide (FSC, 2016), and 300 million PEFC-certified (PEFC, 2016) with a small percentage of the certified area being certified under both schemes (UNECE, 2012). However, most of the area covered is in the Northern hemisphere, where there often is considerable government regulation, probably making the effort to enter much lower. Only 6% of all tropical forests worldwide, where most biodiversity is located, are certified (IDH, 2013).

4.2. Motivational dimensions

4.2.1. Interests

Sustainable Forest Management (SFM) is a concept aiming to embrace and reconcile the different economic, social and environmental interests in forests. However, these interests are diverse and usually require trade-offs. For example, producers often prefer the flexibility to determine their own actions, while non-producers tend to prefer more prescriptive standards and policies (Auld et al., 2008). The FSC has been categorized as a *performance-based scheme* (Sprang and Meyer-Ohlendorf, 2006), while the PEFC is a *producer-backed scheme*, representing the interests of the international forest industry and trade organizations (Peña-Claros et al., 2009), and some PEFC-endorsed schemes (e.g. the Canadian CSA) have been characterized as *system-based standards*, focused more on the presence of a forest management system. Some producers have objected to the stringency and inclusiveness of the FSC's environmental and social standards (Auld et al., 2008).

Although certified timber represents an important market opportunity, governments of countries whose forestry industries represent an important economic sector have an interest in defending these industries, and can be expected to have less stringent and inclusive approaches towards SFM in general and conserving biodiversity more specifically. Another important interest of forest-rich countries is defending their sovereign rights to decide themselves how to manage their forests and biodiversity (Humphreys, 2009). Important is also the interests of indigenous communities. For several forest-rich countries, this is a highly political and contentious issue. Since the FSC is in general more stringent on recognizing communities' rights, some countries are less keen to support or acknowledge this scheme.

4.2.2. Values

Forest certification has been supported by the current dominant preference for market-based environmental policies over governmental policies. However, some actors, such as certain NGOs and social scientists, view certification specifically, and market-based approaches towards sustainable development more generally, as representing the 'commodification of nature' and are critical of this development. The NGO movement is increasingly divided into 'collaborative' NGOs, which work together with companies to make markets more sustain-

able, and 'campaigning' NGOs, who critique the underlying values and nature of market-based approaches and the limited effectiveness of certification (Visseren-Hamakers, 2013).

4.2.3. Framing

Certification is often framed as having a large contribution to SFM and biodiversity conservation, see e.g. Sheil et al. (2010). In parallel, however, there are also negative frames around forest certification that see it as part of the commodification of nature (see above) or as simply insufficient to prevent forest degradation and biodiversity loss. A quite different, emerging, way of framing certification in the forestry sector is to look at it as part of the solution to climate change. Sustainable management of forests is currently being addressed as part of REDD +, a mechanism for reducing emissions from deforestation and forest degradation in developing countries under the UNFCCC (UNFCCC, 2011). Forest certification standards have not fully made use of the opportunity of the attention given to (the role of forests in) climate change, both in terms of framing and financially. FSC has been hesitant to become involved in climate change activities, but has started to become engaged (De la Plaza Esteban et al., 2014).

4.2.4. Leadership

As one of the first large certification schemes for more sustainable forestry, FSC has contributed significantly to the institutionalization of the certification instrument (Visseren-Hamakers, 2013), although SFM has not yet become the "new normal" throughout the forestry industry, even after decades of experience with certification. Environmental NGOs like WWF played key roles in setting up the FSC, but their leadership came perhaps partly as a response to the lack of leadership by governments to devise global legally binding norms with regard to forests in the early 1990s. Different environmental and development cooperation NGOs have taken the lead in substantially increasing the FSC-certified area in tropical forests and the trade of FSC-certified products. In addition, many governments have promoted both FSC and PEFC certification in their countries, for example through public procurement (see above). Other, more critical NGOs have focused on ensuring that the FSC standard continues to be enhanced.

4.3. Means

4.3.1. Knowledge

Public awareness of forest certification is limited, and many end-users do not understand the meaning of certified forest products, and the differences between the standards. Also, while there is a substantial literature assessing sustainability and biodiversity-related issues in forest certification, many authors agree that there is a lack of empirical studies of the ecological impacts of forest certification (Clark and Kozar, 2011; van Kuijl et al., 2009). It is also relevant to mention that the summaries of FSC audit reports are public, contrary to those of the PEFC, thus most desk-based research on certification effectiveness has focused on FSC (Sprang and Meyer-Ohlendorf, 2006).

4.3.2. Time

The relatively long time horizons in forestry, as compared to other sectors, support investing in certification and sustainability. There is a potential trade-off, however, in forestry but also more generally, between quicker certification with schemes with lower demands, and slower growth with schemes with more stringent demands which could take more time to implement.

4.3.3. Financial resources

The FAO (2008) has shown that at the global level in 2006, the (formal) forestry sector employed 13.7 million people, generated US\$ 468 billion in value-added (i.e. the forestry sector's contribution to GDP), and exported products with a total value of US\$ 291 billion (i.e. the sector's contribution to trade balances). This economic importance

of the forestry industry can influence the potential willingness of governments to demand SFM. At the level of the individual producer the cost of certification can be a considerable obstacle, and is certainly one of the reasons for the slow growth of certification in developing countries. The expected premiums on certified timber are also often disappointing. Development cooperation funding could be an important source to enhance the biodiversity mainstreaming potential of forest certification.

5. Conclusions

This article has presented a framework for identifying the opportunities for the mainstreaming of biodiversity in contexts of governance in economic sectors where such mainstreaming would really matter. In contrast to much of the earlier mainstreaming analyses that tended to focus on government-led mainstreaming, this article has attempted to think through the implications of the governance contexts in economic sectors drawing on a rapidly evolving yet still highly heterogeneous governance literature and expertise. This focus is especially pertinent as the main drivers for biodiversity loss are found in economic sectors and lie beyond the reach of traditional, governmental biodiversity policy-making, something which is now broadly acknowledged in the CBD process where in 2016 the theme of the thirteenth Conference of the Parties was ‘mainstreaming biodiversity for well-being’. In this effort to reconsider mainstreaming in contexts of governance we highlight the need to provide systematic attention to three key governance dimensions and ten sub-dimensions and the identification of potential barriers and levers in these. The framework enables casting a wider net for identifying the opportunities and mainstreaming strategies with the most potential (see [Tables 1 and 2](#)) and thus enabling the identification of more opportunities for action and more diverse strategies for action.

The repertoire of regulatory instruments expands by using the

framework as a heuristic tool, for example from government laws and regulations to voluntary standards developed by multistakeholder partnerships, although the standards come with the caveat that they require strong accountability frameworks to ensure compliance. Furthermore, the analysis of the means of governance dimensions in the forestry case highlights considerable challenges for such standards over time if they are not on sufficiently sound scientific basis, that is they are able to show value for money and effort in the form of biodiversity conservation. The potential role of catalytic alliances for example focused on awareness rising across sectors is highlighted as is the gains to be made if much has been invested in trust building among diverse actors in a sector. Trust building in turn is linked to the presence of actors that are meeting each other, reflecting together and willing to collaborate. The framework further illustrates the importance of institutions that can be flexible, build horizontal coordination structures and tolerate somewhat blurred responsibilities could favour experiments of mainstreaming in different directions.

The possible broad range of motivations for biodiversity conservation, from self-interest to altruism, is made visible in the framework and so is the need for reciprocal mainstreaming, that also explicit conservation efforts integrate the needs of the producers and workers in the economic sectors who may depend on them for their livelihood. While this by itself is not a new perspective, it is clear that there is much to be done to increase mutual dialogue and reflection on biodiversity and its conservation among various actors involved in the economic sectors. Here a combination of pressure on companies from campaigning NGOs and outreach from collaborative NGOs may provide a significant opportunity, if also supported by an enabling institutional environment from the side of governments and intergovernmental organizations. This does not require a consensus frame on mainstreaming or biodiversity, a plurality of frames can enable co-creating and active reframing. Opportunities could also emerge when there are leaders

Table 2
Barriers and levers for addressing biodiversity in the forestry sector.

Governance dimensions and sub-dimensions		Examples of barriers	Examples of levers
Institutional	Horizontal interactions	– Capacity to implement certification varies across countries	– Large companies are already using certification – Professional consumers (both governmental and private) are an important market for certified forest products
	Vertical interactions	– The differences in the stringency of PEFC across different countries makes its potential for biodiversity mainstreaming difficult to assess at a global level	– NGOs can play an important role in vertical governance, as they have partners and are active at all governance levels
	Policies and norms	– The differences between the biodiversity mainstreaming in the FSC and PEFC schemes are not well known and contested	– The question whether the standards are involved in a ‘race to the bottom’ or ‘race to the top’ influences their mainstreaming potential
Motivational	Interests	– Contentious issues such as sovereignty and rights of indigenous and local communities can be a barrier for large-scale implementation of forest certification – The forestry sector is important for many national economies, discouraging ambitious biodiversity targets	– Market opportunities in certification if demand increases
	Values	– The ongoing debate on the appropriate approach to SFM may be a barrier for the success of forest certification as a whole – The question is what will happen in the longer term in the relationship between collaborative and campaigning NGOs	– The current preference for market-based governance can support the potential of forest certification in biodiversity mainstreaming, although its popularity seems to slow down a bit
	Framing	– The negative framing of market-based approaches by different actors	– The current relatively large attention for REDD + can support further expansion of forest certification
	Leadership	– Certification has not yet become ‘the new normal’ across the forestry industry	– NGOs can play an important role in promoting and enhancing certification
Means	Knowledge	– The knowledge gap on the biodiversity impact of forest certification in general and specific standards needs to be solved – Consumers not sufficiently informed about forest certification	– The awareness on the knowledge gap is growing, and research is starting to be done
	Time	– There is a trade-off between quicker certification with schemes with lower demands and slower growth with schemes with more stringent demands which could take more time to implement	– Relatively long time horizons in the forestry sector
	Financial resources	– Certification can be expensive, and premiums for certified timber can remain low	– Potential inflow of resources through carbon-focused measures – Various NGO and donor efforts to support certification initiatives

who can promote a culture of courageous conversations, mobilize many to lead including by enhancing their diversity and provide a value-based direction.

Finally, there are opportunities in the diversity of means available such as knowledge, in the form of information tools that visualize the value of biodiversity in broader terms and over time for economic sectors, and in expanding support for much longer term planning horizons and innovative finance mechanisms.

In summary, we suggest that by using the proposed framework a broader set of opportunities for mainstreaming biodiversity in economic sectors can be identified. These can then be considered by for example governments, businesses, NGOs or collaborative arrangements involving them all as a tool for strategic discussions of in which direction to take mainstreaming efforts in their particular context of institutions, motivations and means. The application of the framework on the forestry case shows that even a limited desk-based analysis using the framework provides a comprehensive, but naturally not exhaustive, list of important barriers and levers for improving the ability of these schemes to mainstream biodiversity in the governance context of the global forestry sector (see Table 2). The analysis shows the importance of the span of actors, - businesses, NGOs and governments - and also the considerable uncertainty on whether the biggest sustainability standards are involved in a 'race to the bottom' or 'race to the top' and on to what degree they each in absolute and relative terms contribute to mainstreaming (and thus conserving) biodiversity. The analysis further highlights the potential for additional motivations and resources for mainstreaming in relation to carbon oriented measures yet provides some sobering perspectives in the barriers of e.g. a negative framing of market-based approaches and finding the balance between quicker certification with schemes with lower demands and slower growth with schemes with more stringent demands which could be more time-consuming to implement.

Finally, the proposed analytical framework and the governance literature it draws own bring out some overall challenges for mainstreaming biodiversity in economic sectors. First, biodiversity may be very far from the core ideas, objectives and interests of the key actors in these sectors. Second, mainstreaming has to fit into a diversity of governance modes along the span of hierarchical to market-based steering. Third, mainstreaming strategies may run the risk of watering down the issue of biodiversity if not accompanied by necessary nature protection policies and political support for making sector strategies more nature inclusive, only then both the conversation objectives and the sustainable use objectives of the CBD can be met.

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