

## POLICY PERSPECTIVE

# “As Far as Possible and as Appropriate”: Implementing the Aichi Biodiversity Targets

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**Abstract**

Past shortfalls to meet global biodiversity targets have simultaneously prompted questions about the relevance of global environmental conventions, and sparked renewed ambition, for example, in the form of the Aichi Biodiversity Targets. While progress toward the Aichi Targets through the Convention on Biological Diversity is well-documented globally, less is known at the national level. We conducted a systematic content analysis of 154 documents to assess the nature and extent of national implementation of the Aichi Targets using Canada as a case study. Results indicate that most responses are aspirational, with only 28% of responses implemented. Implemented responses tend to be associated with targets with specified levels of ambition that emphasize biophysical values, or targets that are relatively straightforward to achieve in this context (e.g., knowledge capacity and awareness). In contrast, targets focused on equity, rights, or policy reform were associated with fewer actions. Implementation of this latter class of targets is arguably stalled not solely because of a lack of effective target design, but because of lack of fit within existing institutional commitments. This suggests that solutions—in terms of improving implementation—lie not only in overcoming known dilemmas of quantifiability, but also in fostering institutional transformation.

**Introduction**

From the Rio Conventions, including the Convention on Biological Diversity (CBD) to the Millennium Development Goals (SDG), and the recent Sustainable Development Goals, the use of targets in global environmental governance (Harrop & Pritchard 2011; Campbell *et al.* 2014; Velazquez Gomar 2014) and international development (Roberts 2005; Le Blanc 2015) has risen markedly in recent decades. Proponents argue that measurable and time-bound objectives are essential to meet the commitments of multilateral agreements (MEAs) and achieve sustainable development (Dernbach 2005). The promise of a targets approach is to inspire “broad-based action by parties and stakeholders” (CBD/COP6 2002), to set a coherent agenda for action, and to raise the international and national profile of progress (Roberts 2005). Others argue that the effective use of targets signals meaningful

commitment within MEAs, and thus credibility of the agreement itself (Dernbach 2005).

Established in 1993, the CBD adopted a targets approach in 2000 with the decision to “develop a Strategic Plan for the Convention” for 2002–2010 (CBD/COP5 2000). Prompted by the “need for more effective and coherent implementation,” this decision included the commitment to identify a “set of operational goals,” and 2 years later, the agreement “to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional, and national level as a contribution to poverty alleviation and to the benefit of all life on Earth” (CBD/COP6 2002). This commitment is known as the *2010 Biodiversity Target*. Yet, repeating an inauspicious trend of falling short of global targets in international conventions (Roberts 2005), recognition of the lack of progress toward the 2010 target was confirmed in the spring of 2010 (Butchart *et al.* 2010). News reports

**Table 1** Summarized descriptions of the 20 Aichi Biodiversity Targets, adapted from the Global Biodiversity Outlook (2014) and the CBD Quick Guides for the Aichi Biodiversity Targets CBD. Unless otherwise noted, each target has 2020 as the end date

Strategic goal/ Aichi Target #	Description of target
<i>Strategic goal A</i>	<i>Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society</i>
1	Public awareness of the values of biodiversity increased
2	Biodiversity values integrated into national and local development and poverty reduction strategies
3	Incentives, including subsidies, harmful to biodiversity are eliminated, phased out, or reformed
4	Sustainable consumption and production
<i>Strategic goal B</i>	<i>Reduce the direct pressures on biodiversity and promote sustainable use</i>
5	Rate of loss of all natural habitats is at least halved or where feasible brought close to zero; degradation and fragmentation significantly reduced
6	Sustainable management of marine living resources
7	Sustainable management of areas under agriculture, aquaculture, and forestry
8	Pollution has been brought to levels that are not detrimental to ecosystem function and biodiversity
9	Invasive alien species prevented and controlled
10	Anthropogenic pressures on vulnerable ecosystems minimized
<i>Strategic goal C</i>	<i>Improve status of biodiversity by safeguarding ecosystems, species, and genetic diversity</i>
11	Protected areas increased (17% terrestrial and inland water areas; 10% coastal and marine areas) and conserved through effectively and equitably managed, ecologically representative, and well-connected areas
12	Extinction of known threatened species prevented
13	Genetic diversity of cultivated, farmed, and domesticated species maintained
<i>Strategic goal D</i>	<i>Enhance the benefits to all from biodiversity and ecosystems services</i>
14	Ecosystems that provide essential services are restored and safeguarded
15	Ecosystem resilience and contribution to carbon stocks enhanced through conservation and restoration
16	Nagoya Protocol on access and benefit sharing is in force and operational (2015)
<i>Strategic goal E</i>	<i>Enhance implementation through participatory planning, knowledge management, and capacity building</i>
17	National Biodiversity Strategies and Action Plans (NBSAPs) are developed, adopted and being implemented (2015)
18	Traditional knowledge, innovations, and practices of indigenous and local communities are respected; full and effective participation at all relevant levels
19	Knowledge, the science base, and related technologies are improved, widely shared, and applied
20	Mobilization of financial resources from all sources increased substantially from current levels

declared the convention's effort a failure (Black 2010), and a few months later, plenary speakers at the 10th Conference of the Parties to the CBD underscored the relevance of the Convention.<sup>1</sup> Paradoxically, efforts to motivate action and assert the credibility of the convention through a targets approach threatened the opposite effect.

The implementation of MEAs faces myriad, known challenges. These include lack of scientific knowledge, lack of political will, political instability, inadequate economic incentives, poor involvement of civil society, and funding limitations to name a few (Bille *et al.* 2010; Gagnon-Legare & Prestre 2014; Adenle *et al.* 2015). On the heels of the perceived 2010 failure, and in effort to overcome known challenges, parties to the CBD agreed to 20 new and ambitious targets—the 2020 Aichi Targets (Table 1). Reflecting broader trends in the use of “global targetry” in sustainable development (Roberts 2005), and conservation (Carwardine *et al.* 2009), the Aichi Targets were designed to be SMART (specific, measurable, ambitious, realistic, and time-bound) (Maxwell *et al.* 2015). This emphasis on SMART targets is constitutive

of broader trends toward the use of market-based instruments in conservation (Muradian *et al.* 2013) and associated inclinations toward a governance logic of “measurementality” based on managerial principles (Turnhout *et al.* 2014). Yet, despite their intended SMART-ness (Maxwell *et al.* 2015), midway global assessments indicate that the majority of targets are unlikely to be met (Secretariat of the CBD 2014; Tittensor *et al.* 2014).

In the vernacular of SMART targets, the uneasy trade-offs that pertain to a convention's credibility lie at the nexus of (A)mbition and (R)eality. That is, set the level of ambition too low, and the target becomes inconsequential and ineffective in addressing the problem the convention was designed for. Set the level too high, and risk failure to implement. Both pathways carry risks for a convention's perceived credibility.

One of the defining insights from the past decade of scholarship on global environmental governance is that MEAs are part of a complex network of diverse actors and institutions that interact across local, national, and international scales (Biermann *et al.* 2012). Yet, scholarly examinations of progress toward the Aichi Targets at

national scales (i.e., beyond the submission of National Biodiversity Actions Plans, NBSAPs) remain relatively underexamined. Notable exceptions include a handful of target-specific studies. Aspects of implementation for Target 11 have been examined in Canada (MacKinnon *et al.* 2015), France (Meinesz & Blanfune 2015), Japan (Naoe *et al.* 2015), and the Philippines (Mallari *et al.* 2016). Target 12 has been examined in Italy (Fenu *et al.* 2015). Further, despite the increasing role of nonstate actors such as environmental nongovernmental organizations (ENGOs) (Gagnon-Legare & Prestre 2014) and business (Pistorius & Freiberg 2014) in biodiversity governance, relatively little is known about how different actors within nation states are seeking to address or align their activities with the Aichi Targets. This is a problematic gap considering that the Aichi Targets (and thus the convention as a whole) are implemented at the national level, and the fact that the full collection of targets is deemed essential to achieve the mission of the CBD. Finally, the use of global targets is often invoked as a means to motivate action, communicate high standards, and assert credibility. Yet, the CBD is implemented through activities taken at the national level, with commitments that are highly qualified. NBSAPs, for example, are the primary mechanism for implementing the CBD, with submittal of an NBSAP<sup>2</sup> being the one legal commitment required of parties (Harrop & Pritchard 2011). Article 6 of the convention text places this requirement in context:

Each Contracting Party shall, in accordance with its particular conditions and capabilities: a) Develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity... and b) Integrate, *as far as possible and as appropriate*, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies [emphasis added] (United Nations 1992).

Thus, success or failure to implement is strongly influenced by social–political context at national levels.

The aim of this article is to deepen understanding about national implementation of global targets in the context of multilevel environmental governance. The specific objectives are to: (1) apply systematic content analysis within a case study approach to examine the nature and extent of engagement with the Aichi Targets in Canada from 2011 to 2016 in terms of actors involved, types of actions pursued, representation of actions across spatial scales and biomes, and relative emphasis of targets; (2) draw policy recommendations to inform the final years toward implementation in the Canadian context; and (3)

develop insights to foster policy-relevant dialog about the roles and possibilities of global targets in environmental governance.

We selected Canada as a case given its consequential role in contributing to global biodiversity. Covering almost 10 million square kilometers of land and water, Canada contains 28% and 15% of world's boreal forests and temperature forests, respectively, 25% of wetlands globally, and the world's longest coastline (Natural Resources Canada 2016). Canada is home to an assessed 70,000 species, including 110 threatened species (Environment and Climate Change Canada 2016). As the first developed country to ratify the CBD, and host of the CBD Secretariat, Canada possesses the apparent institutional capacity and political stability that one might expect to contribute to successful implementation.

## Methods

### Document selection

We identified and reviewed publicly accessible English language policy, planning, public relations, and technical documents that addressed the Aichi Targets in Canada between January 2011 and April 2016. Our systematic search included manual and keyword-driven approaches. For the former, inclusion criteria included all official documents produced by the National Focal Point (Environment and Climate Change Canada) as well as Natural Resources Canada, and provincial and territorial environment agencies. For the latter, we used Google-advanced search tools using the terms "Aichi Target," "biodiversity target," and "Convention on Biological Diversity" in all possible combinations using the domains ".ca," ".gc.ca," ".org," ".bc.ca," ".alberta.ca," ".sk.ca," ".mb.ca," ".ontario.ca," ".qc.ca," ".nl.ca," ".gnb.ca," ".ns.ca," ".pe.ca," ".yk.ca," ".nt.ca," and ".nu.ca." This strategy identified 237 documents. After duplicates were removed, 230 documents were screened for our inclusion criteria. We subsequently reviewed 184 full-text documents and removed 30 that did not meet the inclusion criteria. Through this process, we identified and analyzed 154 documents. Figure S1 summarizes the document inclusion process. Table S1 contains a complete list of documents analyzed.

### Analysis

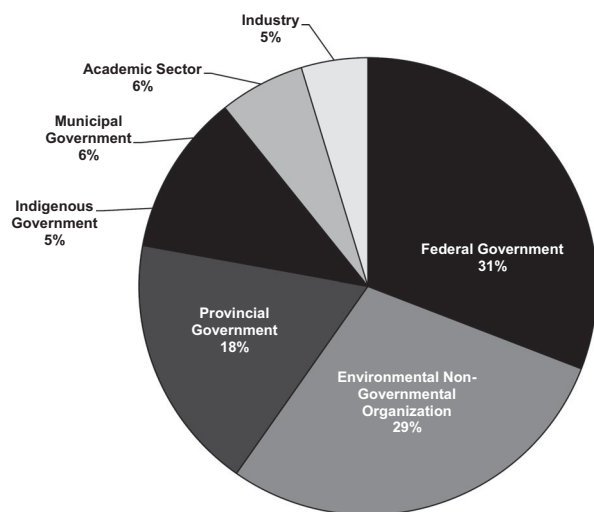
The 154 documents were systematically analyzed using content analysis. Content analysis describes a class of qualitative and quantitative analytical approaches for analyzing textual data that are sometimes classified in terms of conventional, directed and summative approaches (Hsieh & Shannon 2005). Here, we apply directed

content analysis following established methodological protocols to summarize trends in key categories of interest. Specifically, we developed a set of *ex ante* coding categories to guide our inquiry. The codes included: type of action, actor group, document type, status, biome, scale, and target. Details of this typology are described in Table S2. Each document was added to QSR International's NVivo qualitative data analysis software (QSR International Pty Ltd. Version 10, 2012). Text was coded line by line according to the typology described above. Frequencies for each category were calculated to explore trends in this context, not to infer generalizability (Hsieh & Shannon 2005). One author (RP) coded all documents. The lead author (SH) independently reviewed a selection of documents to ensure reliability.

## Results

### Actors

Seven different actor groups produced the 154 documents analyzed in this study. More than half of the documents were produced by federal agencies (31%) and ENGOs (29%) (Figure 1). The majority (50%) of documents produced by federal agencies were progress reports. ENGOs produced a range of documents including progress reports (39%), annual reports (20%), and policy briefs (20%). Figure S2 details the types of documents produced by different actors.



**Figure 1** Distribution of documents produced by different actors ( $N = 154$ ). For documents authored by more than one actor group ( $N = 4$ ), each actor group received attribution. Note: The term "indigenous government" is used here to reflect a "nation-to-nation" or "government-to-government" perspective of the relationship between federal or provincial governments and indigenous peoples (not nation-to-stakeholder).

### Responses

Our analysis identified 2,222 responses related to the Aichi Targets. Seventy-two percent of these (1,593) were aspirational. Twenty-eight percent (629) were implemented (Figure 2a). We identified seven types of implemented responses: information support (35%), resource mobilization (20%), institutional planning (14%), collaboration (12%), public awareness (11%), monitoring (6%), and consultation (3%) (Figure 2b). Descriptions and examples for each category are summarized in Table S3.

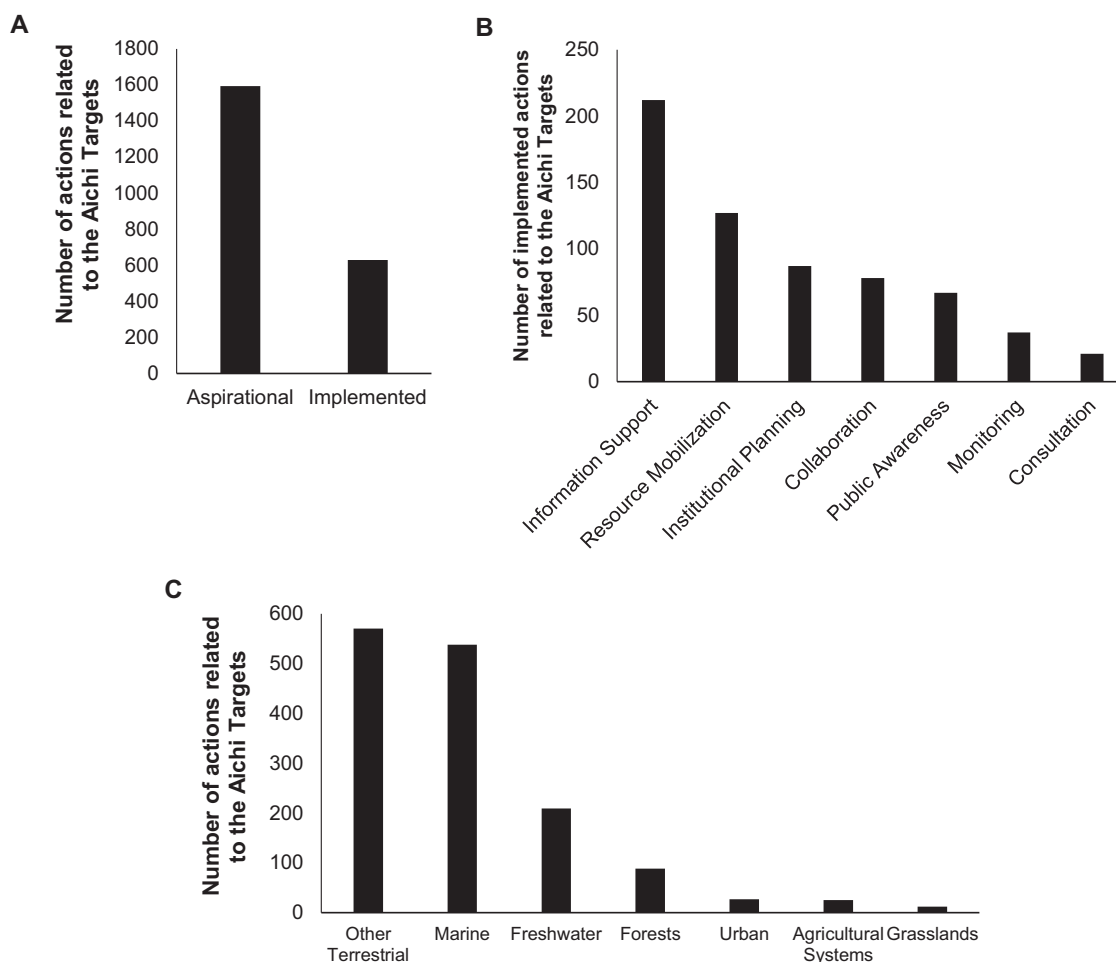
### Geographic and socioecological focus

To varying extents, responses were detected in all Canadian provinces and territories. British Columbia (BC) was associated with the greatest number of responses (both aspirational and implemented) (Figure S3). Figure S4 illustrates patterns of engagement with specific targets for each province/territory. The majority of responses (both aspirational and implemented) were associated with nonforest-specific terrestrial (39%) and marine (37%) ecosystems (Figure 2c).

### Extent

Targets 11, 19, 1, 12, and 14 were associated with the greatest number of implemented actions (between 121 and 57). The remaining 15 targets were associated with less than 43 (to 0) implemented responses each (Figure 3). Informed by previous scholarship and known dilemmas associated with the use of targets in MEAs (e.g., as relates to lack of quantifiability), we present the number of responses for each target by clarity in level of ambition and focal emphasis of the target (Table 2). As detailed by Butchart *et al.* (2016), each individual Aichi Target contains multiple elements some of which may be quantifiable, while others may not be (e.g., T5, T11, T15). Accordingly, we use three categories to describe the clarity in level of ambition for each target: all elements quantifiable, at least one element quantifiable, and no specified level of ambition. For emphasis, we developed and applied a set of categories drawn from an understanding of the literature on policy implementation and global governance.

Across the 20 targets, three are characterized as fully quantifiable, three as partially quantifiable, and 14 as having no specified level of ambition. In this context, the six quantifiable or partially quantifiable targets were associated with targets located across the spectrum in terms of the number of implemented actions (Table 2). For instance, quantifiable or partially quantifiable targets were associated with targets with relatively high levels of



**Figure 2** Number of actions related to the Aichi Targets by (a) status of implementation, (b) type of action (considering implemented actions only), and (c) focal biome (aspirational and implemented actions). Actions may belong to more than category (e.g., projects designed to achieve both collaboration and public awareness objectives) or more than one biome (e.g., funding for both terrestrial and aquatic protected areas), in which case counts are made for each relevant category.

implemented actions (e.g., T11), and relatively low levels of implemented actions (e.g., T16). Six of the top 10 targets included those focused on alleviating impacts and pressures or sustaining biophysical values. Five of the six targets focused on equity, rights, and policy reform occurred in the bottom 10.

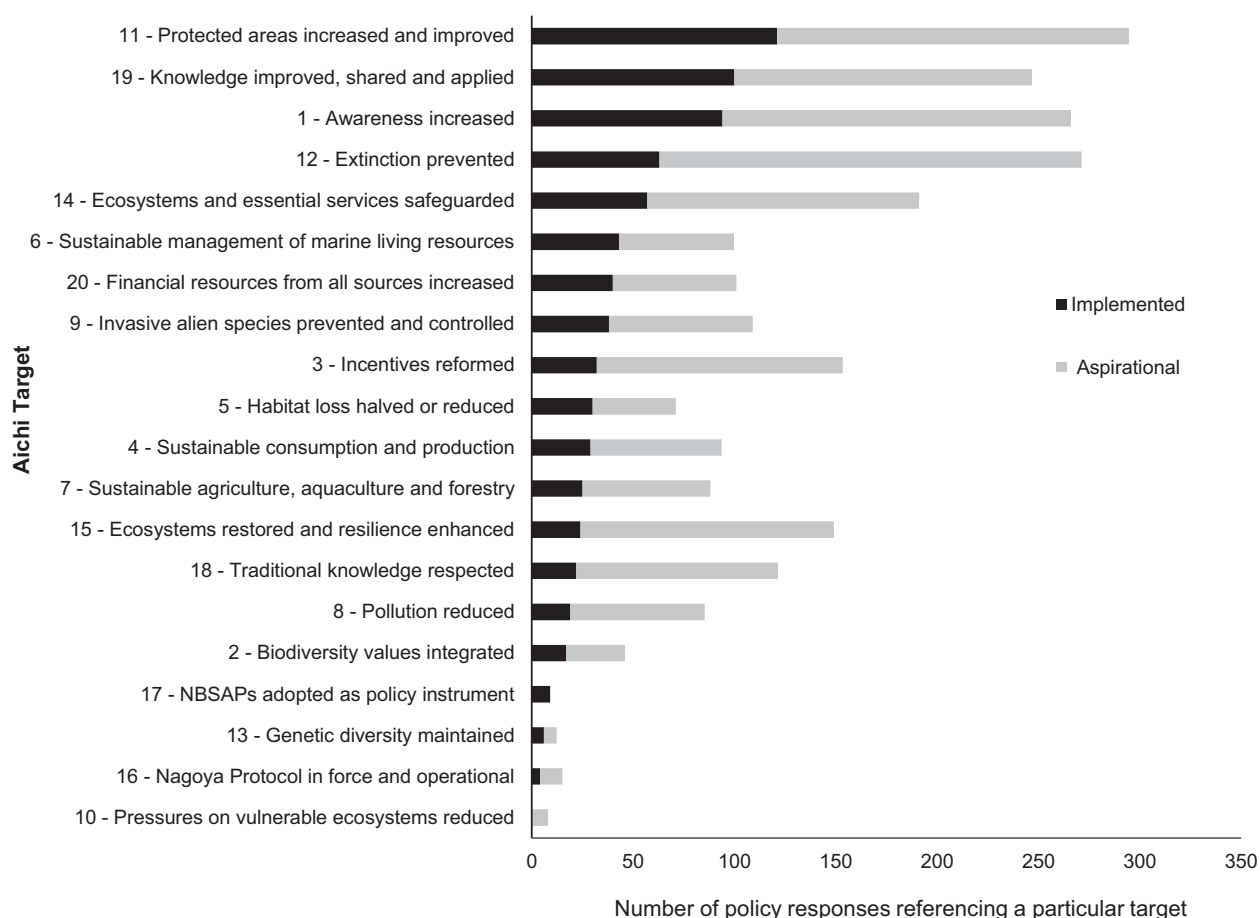
## Discussion

From critical to normative perspectives, most conservation scholars and practitioners recognize the potential of MEAs to contribute to conserving biodiversity and the equitable use and sharing of benefits. Some argue that MEAs are increasingly relevant as a governance response given the magnitude of global change and the need for “planetary stewardship” (Biermann *et al.* 2012). Yet, cast

in the light of persistent shortfalls to meet targets, MEAs face a potential crisis of credibility—particularly in the eyes of those who may question whether MEAs “matter” (Andresen & Hey 2005). Our finding that engagement with the Aichi Targets in Canada tends to be mostly aspirational, thus raises concerns voiced by others, that while nation states proclaim their membership to conventions like the CBD, substantive efforts remain insufficient (Morgera & Tsioumani 2011).

## Which targets left behind?

The finding that some quantifiable or semiquantifiable targets that tend to emphasize biophysical values and impacts (e.g., T11 and T12) are associated with higher numbers of implemented responses in this context in



**Figure 3** Number of implemented and aspirational actions for each of the 20 Aichi Biodiversity Targets. Some actions are associated with more than one target (e.g., providing funding [Target 20] to establish a protected area [Target 11]) in which case counts are made for each relevant category.

contrast with those that are focused on equity, rights, or policy reform is not surprising, but cause for concern. It is not surprising given the volume of conversation about the need for quantifiable ecosystem-service-focused accounting (e.g., The Economics of Ecosystems and Biodiversity initiative), in conservation governance (Macdonald & Corson 2012). This finding is also consistent with recent CBD analyses that found that national reports tend to use indicators for some targets (specifically those that are quantifiable) (e.g., 5, 11, and 12) more than others (CBD/SBSTTA20 2016).

The degree of quantifiability, however, provides only a partial explanation as the targets moving forward in this case are those that are aligned with and reinforced by conventional institutional commitments and norms, including those that are relatively straightforward to achieve in this context. The relatively high frequency of responses associated with increasing protected areas (PAs) (T11) is a prime example of the former where in

addition to being buoyed by a legacy of institutional commitments, PAs are further reinforced as the “natural solution” in a world increasingly affected by global change (Dudley *et al.* 2010). Capitalizing on the institutional centrality of PAs, diverse actors frame their objectives (e.g., biodiversity, carbon, and livelihoods) through PAs, thus making PAs, “everyone’s solution” (Corson *et al.* 2014). Similarly, while having no specified level of ambition, progress for other targets with relatively high levels of implemented actions (e.g., knowledge sharing [T19] and public awareness [T1]) is arguably enabled by an institutional context in which science capacity is relatively high, and “understanding awareness” reasonably easy to claim progress toward.

By comparison, targets that are “left behind,” such as the explicitly quantifiable target on access and benefit sharing (T16),<sup>3</sup> integrating biodiversity into national accounts (T2), or ensuring rights and customary use of biological resources by indigenous and local communities

**Table 2** Aichi Targets presented in order of the most (Target 11) to least (Target 10) number of implemented actions, and characterized by specificity of level of ambition, and target emphasis. For specificity in level of ambition, filled circles indicate targets for which all target elements are quantifiable, half-circles indicate targets that have at least one quantifiable element, and empty circles indicate targets for which there is no specified level of ambition. Asterisks denote the primary emphasis of the target

Target	Specificity of level of ambition			Emphasis					
	All elements quantifiable	At least one element quantifiable	No specified level of ambition	Alleviating impacts and pressures	Sustaining biophysical values	Enabling policies, protocols and planning processes	Knowledge capacity and resource mobilization	Ensuring equity and rights	Promoting increased public awareness
11		◐			*				
19			○				*		
1			○						*
12	●				*				
14			○		*				
6			○	*					
20			○				*		
9			○	*					
3			○			*			
5		◐		*					
4			○			*			
7			○	*					
15		◐			*				
18			○					*	
8			○	*					
2			○			*			
17	●					*			
13			○		*				
16	●							*	
10			○	*					

are respected (T18), include those that challenge prevailing institutional norms and governance arrangements. Despite landmark decisions within Canadian law (e.g., *Delgamuuk v. British Columbia - 1997*, *Tsilhqot'in Nation v. British Columbia - 2014*), and cogovernance arrangements for some conservation areas (e.g., Gwaii

Haanas), there remain deeply contested and competing claims regarding jurisdiction and management authority for extensive areas where Crown and Indigenous governments assert ownership, rights, and responsibilities over the same area. It is amidst this backdrop that progress toward the target relating to ensuring that rights

and customary use of biological resources are respected (T18) can be viewed as posing a challenge to prevailing social–political structures of jurisdiction and management authority.

Thus, we argue that implementation for these targets may be stalled not necessarily because of their lack of SMART-ness—specifically measurability in terms of quantifiability, but because of their institutional disruptiveness. This suggests that solutions—in terms of improving implementation—lie not only in overcoming known dilemmas and challenges related to the lack of quantification of targets (Butchart *et al.* 2016), but also in fostering institutional transformation and change.

Our review invites consideration of a number of potential pathways for policy action, and questions for future research. First, the relative underrepresentation of implemented actions associated with targets related to equity (T16) and rights (T18) is significant considering that these components are central to the mandate of the CBD. Further, equity dimensions of otherwise high-profile targets—notably the PAs target (T11)—have also received relatively little attention, where the overriding focus has rested instead on the (quantifiable) element of spatial coverage. The prospect of continued slow progress in this realm poses potential risks for indigenous and local communities, as well as for the perceived credibility of the convention itself. While outreach initiatives tend to emphasize the need to increase public awareness of biodiversity values, our analysis suggests the need to increase awareness of the importance of rights and equity in biodiversity conservation, and to translate this awareness into progress for equity-related targets, and equity dimensions of targets like Target 11. Outstanding questions to be addressed include: To what extent, if at all, is this observation reproduced in other social-ecological contexts? What explains variation where it is observed? What institutional arrangements or policy interventions might enhance progress for those targets that do not confirm easily within existing governance arrangements? What potential levers toward transformation might be applied to achieve these crucial dimensions? Given that successful implementation of complex MEAs requires time (Andresen & Hey 2005), what is the relationship between protracted and marginal progress toward global targets and the perceived credibility of the convention?

Second, the engagement of state and nonstate actors with the Aichi Targets is revealing both in terms of who is, and is not engaged. Relatively high levels of engagement by ENGOs are expected given the increased involvement of nonstate actors in conservation governance generally. The finding of low levels of engagement by indigenous governments requires deeper scrutiny. In Canada

and worldwide, indigenous governments have engaged in conservation for millennia, although formal recognition by global conservation institutions—for example, in the form of Indigenous and Community Conserved Areas (ICCAs)—is a relatively recent development. Further, indigenous communities are asserting their rights to their traditional territories for which nation states may or may not recognize. Therefore, while our analysis suggests thin engagement by indigenous governments with the Aichi Targets, there are historical and sociopolitical reasons why indigenous governments may choose not to engage directly with state-sanctioned initiatives like the Aichi Targets. Lastly, as the CBD seeks to maximize alignment and synergies with mechanisms including the SDGs and within the UNFCCC, outstanding questions include: How are these efforts shaping the development and pursuit of targets at the national level, particular as relates to the rights, involvement and participation of indigenous peoples and local communities?

The analysis presented here provides an overview of actions at a particular point in time within the bounds of our sample frame and methodology. There very likely exist documents related to the Aichi Targets that we did not have access to. Further, this study does not offer insights into the sociopolitical processes that shape how specific implementation activities are designed, adopted, and pursued at different levels of governance and by different actors. By applying analytical tools from the social sciences to an interdisciplinary challenge, this work offers a novel and systematically derived snapshot of the types on actions moving forward in the Canadian context that serve to highlight persistent blind spots in the implementation of the CBD, and tensions inherent to the use of global targets in multilevel governance.

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1. Based on participant observation field notes taken at the 10th Conference of the Parties to the Convention on Biological Diversity (COP 10 - CBD) by the first author in October, 2010, Nagoya, Japan
2. As of April 2016, 79 of 196 (40%) Parties had submitted NBSAPs that take the Strategic Plan, and thus the Aichi Targets into account (<https://www.cbd.int/nbsap/>).



3. Canada is not a party or signatory to Nagoya protocol. As reported in Canada's 5th National Report to the Convention on Biological Diversity (2014), "Canada is engaging provinces, territories, Aboriginal groups and other key stakeholders to provide them with an opportunity to consider possible elements of a domestic ABS policy and contribute to an increased understanding of the potential impacts of the Nagoya Protocol in Canadian jurisdictions" (p. 98).

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