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LITERATURE-BASED ASSESSMENT AND LESSONS LEARNT ANALYSIS OF PROGRESS TOWARDS THE AICHI TARGETS - INPUT TO SBSTTA 22/COP14

Note by the Executive Secretary

1. The Executive Secretary is circulating herewith, for the information of participants in the twenty-second meeting of the Subsidiary Body on Scientific, Technical and Technological Advice and the second meeting of the Subsidiary Body on Implementation an information document summarizing new research relating to the framing and articulation of the Aichi Biodiversity Targets. The document has been prepared by the Royal Society for the Protection of Birds and BirdLife International with support and advice from the United Nations Environment Programme's World Conservation Monitoring Centre and the Secretariat of the Convention on Biological Diversity and financial support from the Government of the United Kingdom of Great Britain and Northern Ireland.
2. The document is being circulated in the form and language in which it was received by the Secretariat of the Convention on Biological Diversity.

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Literature-based assessment and lessons learnt analysis of progress towards the Aichi Targets - input to SBSTTA 22/COP14

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EXECUTIVE SUMMARY

This document summarises new research relating to the framing and articulation of the Aichi Biodiversity Targets (hereafter termed the ‘Aichi targets’) and identifies specific characteristics of the targets and their constituent elements that could arguably be altered in any revised post-2020 global biodiversity framework, should that be deemed appropriate by parties.

The Aichi targets have been much praised for being broadly based (covering the state of biodiversity, pressures acting upon it and responses to biodiversity loss), a significant improvement compared to the 2010 Target, ambitious in some cases, and have been applauded for seeking to achieve specific end points or states for conservation management. They have also however been criticised for ambiguity; lack of specificity and quantifiable objectives, both in terms of measuring progress and for baselines and indicators; comprehensiveness; and their ambition has been questioned in terms of sufficiency to protect and restore biodiversity and ecosystem services.

Green et al. (submitted) used an expert-based approach to score the relative ‘SMART’-ness of the Aichi target elements. Specifically, they collected expert opinion data to assess the degree to which the 20 Aichi Targets were considered Comprehensive, and their constituent elements were considered Specific, Measurable, Ambitious, Realistic, Unambiguous and Scalable (all targets are Time-bound). They found that:

- a. all targets were perceived by the experts to be moderately Comprehensive;
- b. the targets with the highest average ‘SMART’ scores were 17, 16 and 9, while the targets with the lowest average ‘SMART’ scores were 10, 14 and 19 – the reasons for these differences can be explained;
- c. there is a significant relationship between the ‘SMART-ness’ of targets and reported progress against those targets. SMARTer targets make more demonstrable progress. The results show significantly greater progress has been made towards ‘SMARTer’ targets; specifically those that were judged more measurable, realistic, unambiguous and scalable;
- d. there was no relationship between Ambition and progress, reflecting a more complex trade-off between Ambition and Realism in target setting; and
- e. targets with the highest average ‘SMART-ness’ scores were those that contained explicitly defined deliverables.

Based on this literature review and outcomes from the questionnaire survey reported on by Green et al. (submitted), it is recommended that any new or revised targets established under the post-2020 global biodiversity framework should:

- be **ambitious but realistic**, recognising that ambition without realism can undermine confidence in the ability to deliver on targets – but equally that ambition also promotes and drives progress;
- be **clearly and unambiguously worded**, and provided with necessary definitions, so that the intent and necessary action or actions, are apparent;

- be **clear and well defined with explicit deliverables**, and therefore amenable and easy to measure in any realistic way; and
- include **quantifiable elements wherever practicable** so as to facilitate both action and the tracking of progress.

In addition it is recommended that any future targets that are under discussion:

- should be **considered and framed against an extended SMART-type set of criteria**, similar to that used by Green et al. and suggested by others (noting that it would be helpful to explore further whether different formulations of the SMART criteria were more or less instructive in framing biodiversity targets); and
- should be **sense checked against a ‘SMART’-type framework using a traffic light system** (Green-Amber-Red), green meaning that the target broadly meets the criterion, amber meaning that it is unclear whether meets the criterion, and red meaning the target does not meet the criterion.

The research in Green et al. (submitted) could be extended usefully to draw on additional information sources, through both literature search and a wider questionnaire-based approach, to provide additional insight into lessons learned at different scales.

INTRODUCTION AND SCOPE

1. In October 2010, the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) adopted a Strategic Plan for Biodiversity for 2011-2020. The Strategic Plan includes 20 biodiversity targets, agreed in 2010 and known as the Aichi Biodiversity Targets (hereafter the Aichi Targets). The overall success of the plan will be judged by the progress made towards the targets and their constituent elements (Secretariat of the Convention on Biological Diversity, 2014). Assessments to date have shown that, while a small number of elements are on track to be achieved or making positive progress, there has been limited progress towards most of them, or even movement away from the target (Secretariat of the Convention on Biological Diversity, 2014; Tittensor et al. 2014). Tittensor et al. reported that societal responses to the biodiversity crisis generally showed improvements, with 21 of 33 response indicators (64%) projected to increase significantly by 2020 and most of the remainder having an increasing trend. In contrast, however, five of seven pressure indicators (71%) showed a worsening situation, and among state and benefit indicators, 11 of 17 (65%) showed significant worsening trends.

2. The Strategic Plan and associated targets will be reviewed in 2020 at COP 15 in China. As preparations begin to consider a post-2020 biodiversity framework, it is prudent to assess which characteristics of the Aichi Targets are associated with achieving success as opposed to stasis or reported failure. If the post-2020 global biodiversity framework sets targets, then we should endeavour to learn lessons from the Aichi targets, and apply those lessons to any revised or future targets. Butchart et al. (2016) made the case for the need for better framed biodiversity targets to facilitate greater progress. Poorly framed targets may reduce the ease of their interpretation, measurability, and inter-comparability. This in turn can hinder capability for monitoring their progress in a transparent and nationally comparable way, and can restrict the development or selection of the most appropriate indicators. Well framed targets are needed to assess progress towards them with sufficient confidence. Butchart et al. (2016) raised concern about the current Aichi targets with regards to their ambiguity, quantifiability, complexity, and redundancy.

3. So there is a need to determine whether the framing of a target has any impact on the progress made towards them. In simple terms, it is sensible to determine whether the targets are well-framed and fit for purpose, and how they might be improved going forwards should new or revised targets be considered.

4. The purpose of this document is to summarise information from recent work (Green et al. submitted) relating to the framing and articulation of the Aichi Targets and identify specific characteristics of the targets that could in principle be improved in a post-2020 framework, should revision take place.

- Green et al. (submitted) first reviewed the published scientific literature for information relating to the perceived 'strengths' and 'weaknesses' of the Aichi Targets, and considered coverage across the different targets.
- They then build on the importance of well-framed targets by presenting the findings of a new study that investigated the relationship between 'SMART' characteristics and reported progress made towards the Aichi Targets.
- Here we make recommendations about how any new or revised targets in the post-2020 framework could be improved, including examples of 'SMARTer' targets from the current framework and suggestions of how less 'SMART' targets could be improved.

Terminology

5. Here, 'SMART' is taken to mean Specific, Measurable, Ambitious, Realistic and Time-bound, in agreement with the target criteria that were recommended following the fourteenth meeting of SBSTTA (UNEP/CBD/SBSTTA/14/10). Note, however, alternative versions SMART criteria exist in the literature (Doran, 1981).

6. Most targets consist of multiple 'elements' covering different aspects of the target (Tittensor et al. 2014). An 'element' is a component of a target that addresses a particular aspect of the topic addressed. For example, Target 1 states: "*By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.*" So this is taken to comprise two elements, 1.1: "*By 2020, [. . .] people are aware of the values of biodiversity*" and 1.2, "*By 2020, [. . .] people are aware of [. . .] the steps they can take to conserve and use [biodiversity] sustainably.*"

7. The 'framing' of the targets means the structure and articulation of the targets, such as the extent to which they meet certain criteria (e.g. in this case 'SMART' criteria).

ASSESSING THE EFFICACY OF THE AICHI BIODIVERSITY TARGETS

8. This section reviews the peer-reviewed scientific literature relating to the framing of the Aichi Targets to provide information on the perceived 'strengths' and 'weaknesses' of the current framework and on the relationship between the framing of targets and reported progress.

9. A systematic search identified 294 publications relevant to the Aichi Targets (Green et al. submitted). There was a large bias towards Target 11, which was explicitly referred to in 61% of publications, nearly three times as many as the next most frequently mentioned target, Target 12. The least frequently recorded in the literature was Target 20, which was explicitly referred to in just 5% of publications, followed by Targets 2, 16 and 18 (each explicitly referred to in 6% of publications).

The framing of the Aichi Targets

Perceived strengths of the Aichi Targets

10. Positive comments have been made about the targets being broadly based (covering the state of biodiversity, pressures acting upon it and responses to biodiversity loss), due, for example, to their consideration of developmental issues and inclusion of qualitative elements (Harrop and Pritchard, 2011;

Gomar, 2014; Harrop, 2014; Rees et al. 2016). The targets were also praised for seeking to achieve specific end points or states for conservation management (Harrop, 2011; Harrop and Pritchard, 2011; Mace et al. 2013). Others favourably compared the Aichi Targets to other conservation targets, and to the previous CBD 2010 Target (Perrings et al. 2010; Wood, 2011; Collen et al. 2013; Mace et al. 2013). For example, the Aichi Targets have been described as being SMARTer than the previous 2010 Target by multiple studies (Harrop, 2011; Wood, 2011; Collen et al. 2013), more successful at addressing drivers than other targets (Mace et al. 2013), and more detailed and ambitious than the Sustainable Development Goals (Rees et al. 2016; specifically referring to Target 11 and SDG14, but also arguably true for Target 12).

Perceived weaknesses of the Aichi Targets

11. **Ambiguities** within the targets have been criticised for providing too much room for subjectivity and leaving the targets open to interpretation (Jørgensen 2015; Polak et al. 2015, 2016; Wood et al. 2015). Ambiguous terms have included “other effective area-based measures” (Heywood, 2016; Juffe-Bignoli et al. 2016; Spalding et al. 2016; Watson et al. 2016; Laffoley et al. 2017), “restoration” (Jørgensen 2013; Jørgensen 2015; Chazdon et al. 2017), “ecologically representative” (Polak et al. 2015; Polak et al. 2016; Chauvenet et al. 2017) “well-connected”, and “sustainable production and consumption” (Butchart et al. 2016).

12. **Unspecific, unquantified objectives** have also been criticised because they make it difficult to measure progress or identify an end-point (Butchart et al. 2016; Heywood, 2016; Juffe-Bignoli et al. 2016). Examples of unspecific, unquantified objectives, include aiming to achieve “significantly reduced” degradation and fragmentation of natural habitats (Butchart et al., 2016), and establish “effectively and equitably managed, ecologically representative” PAs (Polak et al. 2015; Butchart et al. 2016; Beresford et al. 2017). Butchart et al. (2016) showed 14 out of the 20 Aichi Targets lacked any quantifiable elements (i.e. had no ‘yes’ or ‘no’ answer, or numerical value or threshold) and only two targets (16 and 17) were composed of entirely quantifiable elements. There is some evidence to suggest that quantifiability of a target is related to the number of responses that are implemented (Hagerman and Pelai 2016). Indeed, the ambiguous, unspecific nature of Target 11’s qualitative elements may have contributed to the quantified area-based elements of the target receiving greater attention and, subsequently, achieving greater reported progress (Tittensor et al. 2014; Juffe-Bignoli et al. 2016; Rees et al. 2016; Watson et al. 2016).

13. **Measuring progress** towards the targets is further complicated by the lack of specific baselines and indicators available to assess some of the targets (Jørgensen, 2013; Mace et al. 2013; Tittensor et al. 2014). Tittensor et al. (2014) found four targets (15, 16, 17 and 18) had no suitable indicators for their analysis and for a further two targets (2 and 14) the only available indicators were poorly aligned with the targets’ elements.

14. The extent to which the targets are ‘comprehensive’ has also been questioned. For instance, Target 13 requires wild species to be “socio-economically as well as culturally valuable” in order to be included, thereby excluding many wild plant species (Edwards, 2017). Additionally, while Target 9 explicitly addresses the prioritisation of invasive species and pathways, it omits mention of high-risk sites particularly sensitive and vulnerable to invasion (McGeoch et al. 2016).

15. Further criticism has focused on the ambition and sufficiency of the targets to achieve their goal. For instance, both the 17% protected area target for terrestrial and inland water areas and the 10% target for coastal and marine areas have been deemed insufficient to protect biodiversity and ecosystem services by multiple studies (Harris et al. 2014; Kadoya et al. 2014; Venter et al. 2014; Larsen et al. 2015; Butchart et al. 2015; Di Minin et al. 2016; O’Leary et al. 2016; Rodriguez-Rodriguez et al. 2016; Dinerstein et al. 2017).

SMART-based assessment of the Aichi Targets

16. This section describes an expert-based assessment of the perceived SMART-ness of the Aichi targets. Carefully chosen assessors were sent a link to the survey executed on SurveyMonkey.com (SurveyMonkey Inc., San Mateo, California, USA). This survey collected expert opinion data to assess the degree to which the 20 Aichi Targets were considered comprehensive, and whether their constituent elements were considered: Specific, Measurable, Ambitious, Realistic, unambiguous and scalable (See Table 1 for definitions used and the scoring system). Each of the targets is already Time-bound so this criterion was not scored.

17. To summarise, all targets were perceived to be moderately comprehensive (of their goal related to their strategic goal). The targets with the highest average 'SMART-ness' scores were 17, 16 and 9, while the targets with the lowest average 'SMART-ness' scores were 10, 14 and 19 (Table 2). However, there was variation within the elements with individual targets. For example, the two area-based elements of Target 11 had high 'SMART' scores, as you might expect, whereas the four other qualitative elements of Target 11 were perceived to be substantially less 'SMART'.

18. When assessing 'SMART' scores per Strategic Goal, Strategic Goal C, focused around improving the status of biodiversity, had the highest overall score. This finding is significant and encouraging because Goal C focuses on 'outcome goals' and on the response to and the state of biodiversity (as opposed to 'process goals' that focus on the 'means' to an 'end' in terms of biodiversity conservation). It is highly gratifying that Goal C was scored so well in this assessment. Strategic Goals A, on addressing the underlying causes of biodiversity loss through mainstreaming, and B, on reducing the direct pressures on biodiversity and promoting sustainable use, scored the lowest. Thus the Strategic Goals focused on addressing the underlying pressures on biodiversity and the causes of biodiversity loss were considered less 'SMART' by these assessors.

19. Similarly, and linked to this, the targets with the highest average 'SMART' scores were those that contained explicitly defined deliverables, for example, Target 17 requires the development of an NBSAP, Target 16 requires specific national legislation, and Target 9 requires an invasive versus not native species risk assessment and pathway analysis. These then, for clarity, are 'process goals' and not 'outcome goals'.

How could the less 'SMART' targets be made 'SMARTer'?

20. To help identify the criteria driving the low 'SMART' scores of Targets 10, 14 and 19 and therefore understand how the framing of these targets could be altered, the scores per criterion per target element were examined. Scores ≤ 5 out of a possible 10 were highlighted as areas for potential alteration.

21. During the SMART-based expert assessment, Target 10 was broken down into two constituent elements: 10.1 "*the multiple anthropogenic pressures on coral reefs [...] are minimized, so as to maintain their integrity and functioning*"; 10.2 "*the multiple anthropogenic pressures on [...] other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning*". The target was perceived to be ambitious (8/10 for both elements) to the point of being unrealistic (realistic = 3/10 for both elements), and scored poorly for being measurable (5/10 and 4/10, respectively) and unambiguous (5/10 for both elements). In this way, the actual target is unclear and poorly defined, and therefore it is difficult to measure in any realistic way.

22. Target 14 was broken down into two constituent elements: 14.1 "*ecosystems that provide essential services, including services related to water, and contributing to health, livelihoods and wellbeing, are restored and safeguarded*"; 14.2 "*[...] taking into account the needs of women, indigenous and local communities, and the poor and vulnerable*". This target was also perceived to be ambitious (8.5/10 and 8/10) but not realistic (4/10 for both elements), and scored poorly for measurable (4/10 and 3.5/10) and unambiguous (5/10 and 4/10). So again, while the target was judged to be ambitious, the detail is unclear, complex and poorly defined, and consequently it is difficult to measure in any realistic way.

23. Target 19 was broken down into two constituent elements: 19.1 “*The science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred [...]*” ; 19.2 “*The science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are [...] applied.*” As with the other two lowest-ranking targets, Target 19 had low scores for ‘measurable’ (4/10 and 3/10, respectively) and ‘unambiguous’ (5/10 and 3.5/10, respectively), and was considered somewhat less ambitious (7/10 and 6.5/10, respectively). In contrast to Targets 10 and 14, there was a notable difference in scores between the two elements of Target 19, with element 19.2 consistently scoring lower than element 19.1 across all criteria. In particular, element 19.1 was considered to be moderately more specific (6/10 cf. 4.5/10), realistic (6/10 cf. 4.5/10, respectively) and unambiguous (5/10 cf. 3.5/10) than element 19.2. As described above, because the actual target is loosely and poorly defined, then measurement against that target becomes extremely difficult.

24. Butchart et al. (2016)’s criticism of the Aichi targets was due to their unnecessary complexity and lack of clarity, a view reflected in Green et al. (submitted). Butchart et al. were concerned that inexact qualifying words, specifically adverbs, like ‘substantially’, be avoided and they suggested a ‘*smaller set of more focussed headline targets that were specific, quantified, simple, succinct and unambiguous*’. Green et al. (submitted) did not assess whether the number of targets was too large or too small, but the call for *specific, quantified, simple, succinct and unambiguous* targets is strongly supported on the basis of expert views received, and by their analysis of progress (see below).

25. One simple practical recommendation in the framing of any future targets would be to sense check emerging targets and target wording against a SMART-type framework in an iterative way. To illustrate, Table 3 categorises the three Aichi targets with the highest SMART-ness (17, 16 & 9) and the three with the lowest perceived SMART-ness scores (14, 19 & 10), against eight SMART criteria using a traffic light system (Green-Amber-Red). It is immediately apparent that the better-framed targets meet many more criteria than those judged to be less SMART, as you would expect. One recommendation is that this simple and rapid approach be considered in the framing of any new or revised CBD targets and wording, whether using these specific eight SMART criteria, or a similar bespoke set developed for this purpose by CBD.

The relationship between ‘SMART’ targets and progress

26. The assessment by Green et al. (submitted) investigated the relationship between ‘SMART’ scores of the Aichi Targets and elements and progress made towards them as reported in the fourth edition of Global Biodiversity Outlook (Secretariat of the Convention on Biological Diversity, 2014) and in analyses prepared as inputs to forthcoming IPBES Global Assessment. The results demonstrated that significantly greater progress has been made towards SMART target elements; specifically those that are more measurable, realistic, unambiguous and scalable (Table 4).

27. The mechanism underpinning the relationship between ‘SMARTer’ targets and progress warrants further investigation. It is plausible that it is easier for governments to identify actions and policies to implement if the target element is more specific and measurable and is unambiguously articulated. Elements that are less precisely worded and open to interpretation may be more difficult to translate into specific actions or policies. It is also plausible that during negotiations it is easier for governments to agree to ‘SMART’ targets for topics that are more tractable and likely to be successful and those that align closely with existing national priorities and work plans. Topics that are harder to address may be more difficult to agree to under a ‘SMART’ framework, and therefore end up being less precisely worded. It is also important to recognise that many additional factors will influence national progress towards targets.

28. While it is natural to expect a positive relationship between SMART criteria (including Specific, Measurable, Realistic, Unambiguous and Scalable) and reported progress towards the targets (SMARTer targets leading to more progress), the relationship between progress and ambition is less easy to predict. At one extreme, as targets become increasingly ambitious it is reasonable to assume that they might become increasingly difficult to meet, leading to the expectation of less progress being made towards more ambitious targets. At the other extreme, it is reasonable to assume that higher ambition stimulates and drives great progress, leading to more progress being made towards more ambitious targets. In reality, Green et al. found no relationship between ambition and progress (Table 4). There was also a non-significant negative relationship between scores for ambitious and realistic, suggesting tentatively that increasingly ambitious targets become increasingly difficult to meet. This highlights that, while it is crucial to have targets that aim sufficiently high to have the positive desired impacts on biodiversity, there is a vital and subtle balance to be found between Ambition and Realism when framing SMART targets. This balance can be met by framing ambitious targets that reflect the true scale of actions needed to halt and reverse the loss of biodiversity at the global scale but that are realistic in the way they take into account practical, financial and other enabling mechanisms.

RELEVANCE OF ASSESSING TARGET FRAMING FOR THE POST-2020 AGENDA

29. **To address some of the perceived limitations of the Aichi Targets, several studies have suggested alterations that could be made when framing a potential revised post-2020 global biodiversity framework. These include further SMARTening of the targets (Wood, 2011) and the provision of more quantitative guidance, such as the role of PAs in protecting threatened species and ecosystems (Polak et al 2016). Bridge water (2011) suggested that in addition to being SMART, environmental policy targets should be ‘CUTE’: Comprehensive, Understandable, Time-bound and Enabling. This suggestion echoes Green et al. (submitted) in proposing an extended set of SMART criteria.**

30. **As described above, Butchart et al. (2016) suggested that a future framework could consider employing a smaller number of more focused headline targets that are specific, quantified, simple, succinct, and unambiguous, and that are accompanied by more specific subsidiary targets covering other aspects.**

31. **There has been a call for greater consideration of sufficiency during any proposed target setting; specifically, targets should reflect levels of conservation actions that are sufficient to protect biodiversity, based on the best available scientific evidence (Di Marco et al. 2016). For instance, in order to aim sufficiently high to halt the loss of biodiversity there have been calls to increase the values of some quantitative elements, particularly those of Target 11 (Locke, 2014; O’Leary et al. 2016; Dinerstein et al. 2017; Krueck et al. 2017). Sufficiency should also be considered when redefining currently ambiguous, unquantified targets. For example, Target 15 could be altered by specifying the average abundance of native species, relative to that in natural habitats, which must be achieved in order for degraded ecosystems to be considered restored (Di Marco et al. 2016).**

32. **There is a relationship between how well framed (SMART) the Aichi Targets are and how much progress has been reportedly made towards them (Green et al. submitted). During negotiations around any new or revised targets, adhering to a ‘SMART’-based framework as closely as possible will likely provide a strong basis for targets that are consistently interpreted, effectively applied and adequate for the conservation, restoration and sustainable use of biodiversity and ecosystem services.**

33. **Overall, there is a strong relationship between how well framed (SMART) the Aichi Targets are and how much progress has been reportedly made towards them (Green et al. submitted); the exception being in relation to Ambition where there is a more complex trade-off with Realism, and**

one could reasonably argue that greater ambition could drive greater progress, or indeed, less progress if such ambition outstrips practical delivery.

34. **During any negotiations around any new or revised targets**, adhering to a ‘SMART’-based framework as closely as possible will provide likely a strong basis for targets that are consistently interpreted, effectively applied and adequate for the conservation, restoration and sustainable use of biodiversity and ecosystem services.

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Table 1. The ‘SMART’-based criteria used by Green et al. (submitted) to assess the framing of the Aichi Targets and their elements. Expert participants were asked to score each target element from 0-10 (or indicate ‘don’t know’). A score of 0 meant the Target element did not fit the criterion at all, a score of 10 meant the Target element completely fitted the criterion (see Green et al. for more details).

Criteria	Definitions
Specific	The Target element sets out clear and well-defined objectives (e.g. quantified percentages, precisely defined terms etc.)
Measurable	Progress towards the Target element can be assessed using data already available or feasible to mobilise by 2020 (e.g. quantitative indicators exist or are realistic to produce by 2020)
Ambitious	The Target element is ambitious and aims sufficiently high to achieve the overall mission to halt the loss of biodiversity
Realistic	The Target element can feasibly be achieved considering the time-frame, practicalities, plausible funding etc.
Comprehensive	The Target covers all important aspects of the issue that it seeks to address
Unambiguous	The Target element is easy to understand and interpret with a single, clear definition
Scalable	The Target element is applicable at global, regional and national scales

Table 2. The Aichi targets with the highest and lowest average ‘SMART-ness’ scores based on an expert assessment of the Aichi Targets. ‘SMART’ ranking: 1 = most ‘SMART’; 20 = least ‘SMART’.

	Target no.	Target	‘SMART’ ranking, from 1 top ranked, to 20 lowest rank
Most SMART	17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.	1
	16	By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.	2
	9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.	3
Least SMART	14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.	18
	19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	18
	10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.	20

Table 3. An example of a checklist assessment of the Aichi targets (from the highest ranked in Green et al. expert SMART assessment, to the lowest ranked from left to right) using a simple traffic light scoring system (Green-Amber-Red). Green = met criterion, Amber = unclear whether criterion is met, Red = criterion not met.

Target rank from highest to lowest in our assessment	17	16	9		14	19	10
<i>Is the Aichi target:</i>							
Specific?	Yes	Yes	Yes		No	Unclear	No
Measurable?	Yes	Yes	Unclear		No	No	No
Ambitious?	Yes	Unclear	Yes		Yes	Yes	Yes
Realistic?	Yes	Yes	Yes		No	Unclear	No
Time bound?	Yes	Yes	Yes		Yes	Yes	Yes
Comprehensive?	Yes	Yes	Yes		Yes	Yes	Yes
Unambiguous?	Yes	Yes	Yes		No	No	No
Scalable?	Yes	Yes	Yes		Unclear	Unclear	Unclear

Table 4. The relationship between ‘SMART’ scores per target element and reported progress taken from a) GBO-4 and b) in analyses prepared as inputs to forthcoming IPBES Global Assessment. Significant = $p < 0.05$; near significant = $p < 0.1$; non-significant = $p > 0.1$. The boxes shaded in green indicate that reported progress against the Aichi target is associated with the SMART-ness of that target (from Green et al. submitted).

Criterion	Relationship	Statistical significance*
Progress assessment from GBO-4 versus:		
Specific	Positive	Near significant
Measurable	Positive	Significant*
Ambitious	<i>Negative</i>	Non-significant
Realistic	Positive	Significant*
Unambiguous	Positive	Significant*
Scalable	Positive	Near significant
Criterion	Relationship	Statistical significance*
Progress assessment from analyses prepared for IPBES Global Assessment versus:		
Specific	Positive	Near significant
Measurable	Positive	Significant*
Ambitious	<i>Negative</i>	Non-significant
Realistic	Positive	Significant*
Unambiguous	Positive	Significant*
Scalable	Positive	Significant*

