2 March 2022

Department for Environment Food & Rural Affairs

Technical submission from the United Kingdom of Great Britain and Northern Ireland (UK) on the monitoring framework for the post-2020 global biodiversity framework

Overview

- Headline indicators should be used consistently by Parties and represent the intersection between national and global indicators.
- Many Parties have noted that monitoring and reporting on 39 headline indicators may not be practical or technically feasible.
- This submission suggests an approach to reduce the number of headline indicators and achieve a robust, deliverable and clearly articulated monitoring framework by:
    - Clustering goals and targets in three groupings
    - Selecting a small number of indicators selected as headlines for each cluster, on the basis of the following criteria:
        - the relevance to the overall scope of the GBF;
        - the technical and practical feasibility of implementation; and
        - the communication value.

The United Kingdom (UK) is seeking an ambitious post-2020 global biodiversity framework (GBF) including a robust, deliverable and clearly articulated approach to the monitoring of progress. In August 2021, the UK set out a proposal for a clustering approach to help reduce the list of headline indicators in the monitoring framework. We have updated this proposal to reflect the non-paper on the monitoring framework, and further discussions, including at OEWG-3 and in the series of workshops co-hosted by the UK and Norway in collaboration with UNEP-WCMC to discuss enhanced planning, reporting and review mechanisms[1]. This document replaces our previous proposal. It provides an understanding of the role and use of headline indicators, an updated proposal for a clustering approach and an assessment of potential headline indicators against selected criteria. Two indicators are also proposed: a component indicator on protected area management effectiveness that could be integrated into the current proposed headline indicator to include an assessment of effectiveness (see Annex 2); and an alternative headline indicator on the global environmental impacts of consumption (see Annex 3).

[1] CBD/SBI/3/INF/37/Rev.1 provides a summary of discussions held between January and November 2021.

Contents

1 Introduction

The non-paper on item 3 for resumed SBSTTA-24 identifies 39 possible headline indicators which could be used to monitor the implementation of the post-2020 GBF nationally, as well as track progress globally. As noted in the Co-Chairs reflections on OEWG-3, "there seems to be general support for the establishment of a list of headline indicators to be used consistently at the national and global levels, to the extent possible" . However, "some Parties felt that the number of headline indicators should be fewer than what is currently proposed". Monitoring and reporting on 39 headline indicators in a consistent manner may not be technically and practically feasible for all Parties (see Annex 1), including the UK, acknowledging the varying levels of reporting capabilities and capacity, and the changes to existing national systems that may be needed. In addition, a reduced number of indicators could facilitate communication to a wide audience.

One approach to reduce the number of headline indicators is to cluster the goals and targets and identify a small set of headline indicators that capture key aspects of progress for each cluster. We recognise there is not a simple nested relationship between goals and targets and often actions (targets) will contribute to two or more outcomes (goals)[2]. **The cluster approach is not intended to restructure the post-2020 GBF, but just provide an approach to help in the selection of a balanced set of headline indicators for a range of audiences.**

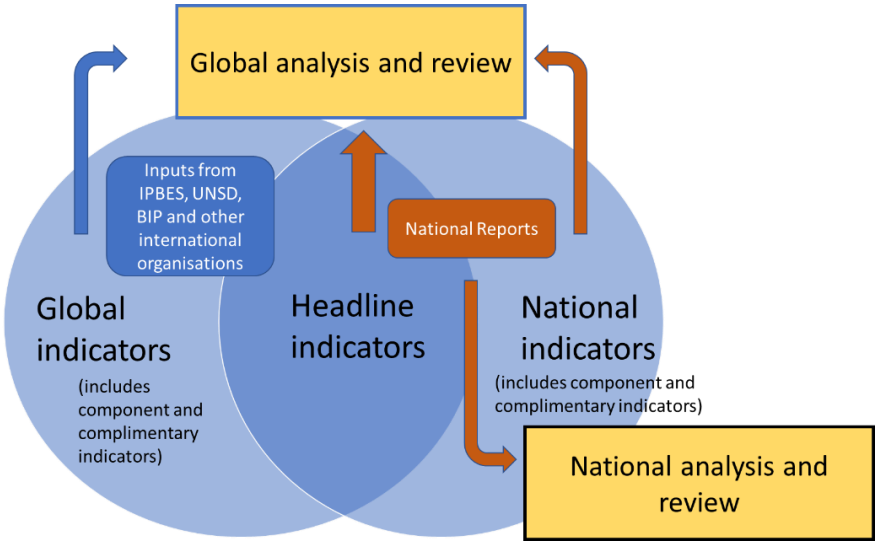
Headline indicators can provide information on progress related to more than one goal and/or target, and a balanced set of headline indicators should facilitate communication of key aspects of the GBF. At the national level, headline indicators should be supplemented with national indicators (which may include component and/or complementary indicators, as appropriate) to measure progress towards all the goals and targets, where appropriate. Headline indicators are one part of the monitoring framework, and we consider other national and global level indicators to be equally important to assess overall progress, especially as part of the national report.

[2] CBD/SBSTTA/24/INF/31 provides an explanation of the complex relationships between actions and outcomes.

2 Headline indicators

The non-paper defines headline indicators as "a minimum set of high-level indicators which capture the overall scope of the goals and targets of the post-2020 GBF, which can be used for tracking national progress, as well as for tracking progress at regional and global levels. These indicators, or a subset of them, can also be used for communication purposes". Headline indicators should be used consistently by Parties and provide a bridge between national and global indicators (see Diagram 1). Headline indicators may be derived from global datasets which can be disaggregated to the national level. Such national disaggregation could then be validated by Parties. Alternatively, if Parties have alternative or more accurate data, national data could be integrated into the global dataset and aggregated to the global level. Approaches to disaggregation, aggregation and national validation have not yet been fully tested.

Diagram 1: Headline indicators represent the intersection between national and global indicators



3 Cluster approach

In order to help derive a smaller and balanced set of headline indicators, we have proposed the goals and targets be clustered in three groups based on the groups of targets presented in the first draft of the post-2020 GBF. The three groups of targets can be associated with the four goals of the GBF as follows:

- **CLUSTER I (Goal A and targets 1-8)**: enhancing biodiversity and tackling immediate pressures;
- **CLUSTER II (Goals B and C and targets 9-13)**: achieving sustainable use & benefits for all; and
- **CLUSTER III (Goal D and targets 14-21)**: mobilising finance and other means of implementation.

Once the goals and targets have been clustered in this way, we propose identifying a small number of indicators as headlines that can be representative of each cluster. This approach can be used to reduce the overall number of headline indicators needed, provides a focus for standardised reporting on a small number of headline indicators that can be aggregated globally and enables easier communication to diverse audiences of our ambitions and progress. The small set of headline indicators will nevertheless need to be supplemented by

other indicators at global and national levels to enable progress against all goals and targets to be assessed.

4 Headline indicator assessment

In order to select a small number of indicators as headlines that can represent each cluster, we propose first assessing headline indicators against a number of criteria. We assume that the 39 headline indicators proposed in the non-paper meet the criteria outlined in paragraph two of its Annex. In addition to such criteria, we suggest that each headline indicator is also assessed as to whether it:

a) provides a strong measure of progress towards the overall scope of the post-2020 GBF;

b) is technically and practically feasible to implement; and

c) has potential to facilitate high-level communication to diverse audiences.

The above three criteria build upon technical criteria related to availability of data and methods, or existing use within other international processes and aligns with additional criteria set out in paragraph 3 of the Annex to the non-paper. This assessment aims to ensure that indicators selected are balanced across the GBF and support a deliverable monitoring framework which can meet the need for clear communication of global priorities.

We have made a preliminary assessment of indicators based on information available (see Annex 1). For example, indicators have been assessed as 'technically and practically feasible to implement' due to the validity of disaggregating global datasets to the national level, as well as the practically of providing national level data for validation and/or aggregation to the global level. We will continue to review our assessment as new information becomes available, including the metadata prepared by the Secretariat of the CBD in collaboration with UNEP-WCMC and funded by the UK Government. We would welcome further considerations by other Parties on our assessment.

Each indicator was determined as 'addressing', 'partially addressing', 'not addressing' or 'insufficient information available to make an assessment' for each of the three criteria. The outcomes of this preliminary assessment are provided in Annex 1.

5 Identification of potential headline indicators

In our assessment, indicators with potential as headlines are those which meet the following conditions:

i. two or more of the criteria were rated as 'addressed'; and

ii. none of the criteria were rated as 'not addressed'.

However, the extent to which indicators are methodologically developed and the degree of data availability varies across the goals and targets. For indicators that are not yet operational, exceptions have been made if the 'technically and practically feasible to implement' criterion was rated as 'not addressed' or 'Insufficient information available to make an assessment'. Indicators are marked with an asterisk in Diagram 2 and implementation as a headline indicator would be subject to appropriate development and the provision of relevant guidance to Parties. As proposed in the SBSTTA-24 virtual session, such indicators would need to be developed under the guidance of an Ad-Hoc Technical Expert Group (AHTEG) on indicators for the post-2020 GBF.

Diagram 2: Potential headline indicators and proposed clustering approach

The diagram below sets out how potential headline indicators, which meet the conditions above, could be organised under each cluster of goals and targets. This can then inform discussions on which headline indicators may be the most effective for each cluster.

2050 VISION **Valuing, conserving, restoring, wisely using, maintaining ecosystem services, creating benefits** **2030 MISSION** **Urgent action across society to put biodiversity on a path to recovery for the benefit of planet and people**		
CLUSTER I **Goal A and Targets 1-8** **ENHANCE BIODIVERSITY AND TACKLE IMMEDIATE PRESSURES**	**CLUSTER II** **Goals B & C and Targets 9-13** **ACHIEVE SUSTAINABLE USE & BENEFITS FOR ALL**	**CLUSTER III** **Goal D and Targets 14-21** **MOBILISE FINANCE AND OTHER MEANS OF IMPLEMENTATION**
Possible headline indicators		
• A.0.1 Extent of selected ecosystems • A.0.3 Red list index • A.0.4 The proportion of populations within species with a genetically effective population size > 500 • 2.0.1 Percentage of degraded or converted ecosystems that are under restoration* • 3.0.1 Coverage of Protected areas and OECMS (by effectiveness)** • 5.0.2 Proportion of fish stocks within biologically sustainable levels • 7.0.1 Index of coastal eutrophication potential	• B.0.1 National environmental economic accounts of ecosystem services* • 10.0.1 Proportion of agricultural area under productive and sustainable agriculture • 10.0.2 Progress towards sustainable forest management • 13.0.1 Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc*	• 15.0.1 Dependencies and impacts of businesses on biodiversity* • Global environmental impacts of consumption*** • 18.0.1 Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated* • 19.0.1 ODA for biodiversity • 19.0.2 Public and private expenditure on conservation and sustainable use of biodiversity and ecosystems • 21.0.1 Degree to which IPLCs, women, girls and youth participate in decision-making related to biodiversity tbc* • 21.0.2 Land tenure in the traditional territories of IPLCs

* Implementation as a headline indicator would be subject to appropriate development and the provision of relevant guidance to Parties.

** There is ongoing development of a component indicator that could be integrated into the current proposed headline indicator to include an assessment of effectiveness. Further information is provided in Annex 2.

*** Proposed as an alternative indicator by the UK (not currently included as a headline indicator in the non-paper). A metadata sheet for this indicator is provided in Annex 3.

What would this mean for targets that would no longer have headline indicators?

Our assessment of headline indicators and the clustering approach do not identify potential headline indicators for each goal and target. Whilst the assessment recognises that headline indicators can provide information on progress related to more than one goal and/or target (see Annex 4), headline indicators will need to be supplemented by additional indicators for global analysis and national level analysis and reporting. In our view, these additional indicators are equally important as part of the monitoring framework but may differ to some extent between countries and between national and global levels. In many cases, there will

be options to use nationally chosen indicators to track progress towards national targets (even though national target should be aligned to global targets). Component and complementary indicators, as well as currently proposed headline indicators that are not adopted as headlines, could be options for national and global level indicators, as well as those already in use by individual Parties. We would therefore request further guidance from the proposed AHTEG to support Parties choosing to implement component and complementary indicators, as that could support comparability across Parties.

What does this mean for headline indicators which are not yet operational?

A small set of headline indicators that cover the key dimensions of the GBF in a balanced way is critical. Just including those headline indicators that are currently operational may not provide this balanced coverage. For headline indicators which are not yet operational, topic titles could be agreed at COP15, with a decision that there would be intersessional work focussed on their development, overseen by the proposed AHTEG, with a view to adoption at COP16.

Annex 1 – Assessment of potential headline indicators

Table 1: Summary assessment of the headline indicators proposed in the non-paper on item 3 for resumed SBSTTA-24 against the criteria as set out in Section 3, as to whether each headline indicator:

a) provides a strong measure of progress towards the overall scope of the post-2020 GBF;

b) is technically and practically feasible to implement; and

c) has potential to facilitate high-level communication to diverse audiences.

Key:

✓ Addresses the criterion

✗ Does not address the criterion

− Partly addresses the criterion

? Insufficient information available to make an assessment

Proposed Headline Indicators[3]	***Strong measure of progress towards the overall scope of the GBF***	***Technically and practically feasible to implement***	***Potential to facilitate high-level communication to diverse audiences***	***Overall assessment***
A.0.1 Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats)	✓ Provides a direct measure of the Goal A component on the 'area of natural ecosystems', as well as outcome of a number of Targets, including Targets 1, 2 and 3.	− Reasonable global datasets exist, particularly for forests. Challenges exist with national and global datasets for other ecosystems, particularly for grasslands and savannahs. Global datasets can be disaggregated to the national level for validation. It will be critical that processes are developed for aggregating national data, which is likely more granular and accurate, to the global level.	✓ This indicator would be easy to communicate and should be well understood by the public.	**Assessment supports inclusion as a headline indicator.**

[3] Indicators marked with "tbc*" are not yet developed and the proposed wording is for an indicator that would need to be developed under the guidance of the proposed AHTEG (source: SBSTTA-24 non-paper on item 3).

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
A.0.2 Species Habitat Index	 Whilst this indicator captures progress towards the 'connectivity' and 'integrity' elements of Goal A, the indicator focuses on a limited number of terrestrial species and currently does not capture habitat pressures across all species or habitats (e.g., marine).	 This indicator is primarily produced at the global level and can be disaggregated to the national level. As the global dataset is calculated using species occurrence data combined with remote sensing, disaggregation may not correspond to SHI values calculated with national information. Challenges may exist with aggregating nationally produced data to the global level.	 It is anticipated that an index value may be more difficult for some of the public to fully interpret.	**This may be better suited as a component indicator.**
A.0.3 Red List Index	 A well-established indicator that is directly relevant to several aspects of Goal A, as well as the outcome of Target 4. However, this indicator is biased towards terrestrial species and is limited to specific taxonomic groups.	 Global datasets are readily available which are annually disaggregated to provide national datasets. National validation processes exist. Challenges however exist with aggregating nationally produced indices to the global level.	 Species extinction is a well understood concept and of interest to diverse audiences. The accelerated rate of species extinction has had significant media attention so this may have strong resonance. A complex index may present some challenges to communication, but the index can be broken down in different ways for different audiences.	**Assessment supports inclusion as a headline indicator.**
A.0.4 The proportion of populations within species with a genetically effective	 Measures progress towards the component of the Goal focussed on maintenance of genetic diversity, as	 The methodology allows that, in the absence of data on effective population size, census size multiped	 There may be challenges around communicating this indicator to diverse audiences due to a lack of	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
population size > 500	well as Target 4. Genetic diversity is the foundation of species and ecosystem diversity and effective population size is highly relevant when considering species-specific conservation priorities. Whilst the Red List Index focusses on global census size, this indicator focusses on genetically distinct populations within taxa, where genetic erosion primarily occurs.	by 0.1 can be used as a proxy, making it easier to apply. Data used for Red List assessments could help calculate this indicator. As many species are distributed across several countries, further information is needed on disaggregation to the national level. In addition, as it would not be practical to assess all species, further information is needed as to how species should be selected to assess[4].	understanding of the significance of genetically effective population sizes.	
B.0.1 National environmental economic accounts of ecosystem services*	 UN SEEA EA measures the values of ecosystems and ecosystem services by ecosystem type and type of services, providing a strong measure of progress towards the components of Goal B. Disaggregation of this indicator also provides measures of progress towards Targets 8, 9 and 11.	 The indicator requires a comprehensive valuation of different ecosystem services so will not be feasible for many Parties for many years. Some ecosystem services are harder to quantify and value. While Parties work to implement the indicator, global datasets disaggregated to the national level could be used to provide relevant data. Whilst such datasets provide useful reference, the data are likely less robust at more granular levels.	 Communicating trends for different ecosystem services could be well understood by diverse audiences. As economic accounting may be less understood, focussing on trends in physical rather than monetary terms may be more effective. There may also be challenges with interpretation; trends in monetary accounts may not correlate to ecosystems services being enhanced or maintained. For example, the value could increase as the cost of carbon increases, rather than due to increases in ecosystems or ecosystem services.	**Implementation as a headline indicator would be subject to appropriate development and the provision of relevant guidance to Parties.**

[4] NatureScot's scorecard approach for measuring genetic diversity includes a methodology for selecting species of socio-economic or cultural importance which could be used alongside A.0.4 to select species to assess.

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
C.0.1 Indicator on monetary benefits received tbc*	 Further detail needs to be provided on this indicator for full evaluation.	 Whilst the issue of maintaining confidentiality of ABS agreements could be limited by collecting benefits 'received', many 'provider' countries may have difficulties with accessing the resources needed to collect this information.	 This indicator could provide a single numerical value at the global level, as well as for each Party, which could be easily presented. However, there may be a lack of public understanding of what ABS agreements are.	**This may be better suited as a component indicator, subject to appropriate development.**
C.0.2 Indicator on non-monetary benefits tbc*	 Further detail needs to be provided on this indicator for full evaluation.	 Gathering this information is challenging due to a lack of reporting and the confidentiality of ABS agreements. Many 'provider' countries may have difficulties with accessing the resources needed to collect this information.	 It is not clear what metric would be presented by this indicator. There may be a lack of public understanding of ABS agreements and the value of non-monetary benefits.	**This may be better suited as a component indicator, subject to appropriate development.**
D.0.1 Indicators on funding for implementation of the global biodiversity framework tbc (aligned with Target 19)*	 D.0.1 overlaps with 19.0.1 and 19.0.2, and it is assumed that D.0.1 would equate to an aggregation of the two Target 9 indicators or be a subset of such finances. Inclusion of D.0.1 therefore provides no added value towards measuring the overall scope of the GBF.	 Data for this indicator is partly available now. However, data collection needs to be developed, particularly for private finance.	 As a monetary value, it is anticipated that this indicator could be easily communicated and understood by diverse audiences. The total amount of funding mobilised for the implementation is also likely to have strong public and political resonance.	**D.0.1 should be replaced by 19.0.1 and 19.0.2.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
D.0.2 Indicator on national biodiversity planning processes and means of implementation tbc*	 Further detail needs to be provided on this indicator for full evaluation.	 Further detail needs to be provided on this indicator for full evaluation.	 Further detail needs to be provided on this indicator for full evaluation.	**Further detail needs to be provided on this indicator for full evaluation.**
1.0.1 Indicator of the percentage of land and seas covered by spatial plans that integrate biodiversity tbc*	 This provides a direct measure of component 1.1 on 'the area under integrated biodiversity inclusive spatial planning'. It is unclear how biodiversity inclusiveness would be determined consistently between national approaches.	 Further detail needs to be provided on this indicator for full evaluation.	 Whilst easy to present through maps or percentage figures, there may be challenges with communicating this due to a lack of understanding of the importance of spatial planning.	**This may be better suited as a component indicator.**
2.0.1 Percentage of degraded or converted ecosystems that are under restoration	 Provides a direct measure of ecosystems under restoration, which is critical to the achievement of the GBF, including for Targets 2, 4 and 8. Regarding Target 2, a gap exists on measuring connectivity.	 Further detail needs to be provided on this indicator for full evaluation. Whilst there is currently no reporting framework at the global level, this indicator aligns with the UN Decade on Ecosystem Restoration monitoring framework which is planning to build on existing reporting processes. Establishing the baseline to calculate percentage change will need to be addressed.	 Restoration is increasingly understood for its importance towards biodiversity conservation and climate change objectives. This could be well understood by diverse audiences.	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
3.0.1 Coverage of Protected areas and OECMS (by effectiveness)	 The indicator directly measures the area protected and conserved (3.1). However, whilst Protected Area Management Effectiveness is a useful starting point, it only determines whether a suitable mechanism for assessing management effectiveness is in place, rather than how effective the PA/OECM is. The UK is proposing a new component indicator to assess management effectiveness, which could be integrated with the headline indicator (see Annex 3).	 This indicator is primarily produced using national level data, which is aggregated to the global level through existing reporting frameworks with national validation processes. Data for protected areas is widely available and is increasingly being reported for OECMs.	 Coverage of protected areas and OECMs is well understood by diverse audiences and easily communicated.	**Assessment supports inclusion as a headline indicator.**
4.0.1 Proportion of species populations that are affected by human wildlife conflict	 Directly relevant to wildlife conflict (4.2) but is less relevant conservation recovery actions (4.1) or genetic diversity (4.3) components of Target 4. It therefore fails to capture the full scope of Target 4.	 There is no information on the exact metric of this indicator or what is meant by “proportion”. Under current wording, it is unclear how this indicator could be realistically measured using a proportion value, as most eukaryote species are arthropods or nematodes which are unlikely to be impacted by HWC.	 There may be challenges communicating this to diverse audiences. HWC is a complex issue and can result in negative impacts for biodiversity and/or people. Expressing HWC as a simple proportion does not allow for communication of this complexity or of the significant variation in types of HWC globally	**This may be better suited as a component indicator.**
4.0.2 Number of plant genetic resources for food and agriculture secured in medium	 Relevant to the genetic diversity component (4.3) through the ex-situ	 This indicator is primarily produced at the national level and can be	 There may be challenges communicating this indicator as it likely	**This may be better suited as a component indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
or long-term conservation facilities	conservation of species used for food and agriculture, but does not address domesticated animals, or any wild plants and animals. Using the number of accessions may also not accurately convey how much genetic diversity is being conserved.	aggregated to the global level. National reporting and validation processes exist, as well as global datasets. However, SDG 2.5.1a shows a lack of progress in this area, suggesting more resources and attention are required. In particular, this indicator may place significant resource demands on some countries.	requires an understanding of the value of genetic diversity for agriculture and purpose of gene banks, which is unlikely to resonate with diverse audiences.	
5.0.1 Proportion of wildlife that is harvested and traded legally and sustainably*	 This headline indicator is relevant to the main component of Target 5, that harvesting, trade and use are sustainable, legal and safe (5.1). However, it does not address human health and therefore does not measure the full scope of the target.	 Further detail needs to be provided on this indicator for full evaluation. It is unclear how this indicator will be aggregated if harvesting is monitored at the national level, with each country having different definitions of 'legal'. There is likely to be significant uncertainties regarding calculation of illegal wildlife harvesting and trade (needed to calculate the proportional metric) and large differences in the amount of illegal trade that goes undetected between countries.	 The harvesting, trade and use of wild species in relation to human health has received significant media attention due to the Covid-19 pandemic. Although human and animal health could be better incorporated into this indicator, it nevertheless has resonance with diverse audiences.	**Further detail needs to be provided on this indicator for full evaluation.**
5.0.2 Proportion of fish stocks within biologically sustainable levels	 Directly relevant to the harvesting, trade, and sustainable use of wild species aspect of Target 5 but does not address health. Limited to marine fish stocks, not addressing the	 The availability of extensive global datasets is likely to make this indicator straightforward for most Parties to implement. Parties should already collect data for this indicator under	 As a proportion, this indicator is likely to be well understood by diverse audiences and easily communicated. Sustainable fishing is also likely to have strong political resonance due to	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
	harvesting impacts on other animal or plant species.	SDG indicator 14.4.1. The HI is produced at both national and global levels and can be aggregated/ disaggregated. National reporting and validation processes also exist.	its direct relevance to other global strategies, such as the SDGs.	
6.0.1 Rate of invasive alien species spread	 Related to the rate of introduction and establishment of invasive species (6.1) but does not address the control or eradication of invasive species (6.2), or ways to reduce impacts on priority species and priority sites (6.3). It therefore fails to capture the full scope of Target 6.	 Rate of species introduction is difficult to measure. The term 'spread' is vague, not defined within the CBD and becomes more ambiguous when applied within a national context. It is likely that this indicator will be primarily produced at the global level and global datasets are near ready. It should be possible to disaggregate these to the national level. However, many Parties currently have no national reporting or validation processes in place.	 Likely to be of interest to diverse audiences as issues surrounding invasive species are receiving increasing media attention, especially in relation to biosecurity and disease spread.	**This may be better suited as a component indicator.**
7.0.1 Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries)	 Eutrophication in coastal environments provides an indicator of nutrients being lost to other environments also, due to the transfer of pollutants between terrestrial, freshwater, and marine environments. In addition to Target 7, this indicator is therefore also relevant to Goal B and Targets 10 and 11.	 Global datasets are available through remote sensing and modelling, that can be used as proxy indicators for eutrophication. Parties with capacity to do so can complement global datasets with national level measurements to enable a more detailed assessment of eutrophication. National level assessments require significant data for nutrient modelling at each river	 Pollution has strong resonance with diverse audiences. There may be challenges with communicating this indicator to the public due to a lack of understanding of what 'eutrophication' is, as well as presentational issues for communicating an index value. However, this could be overcome through simplification to communicate trends of pollutants in coastal waters.	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
		basin mouth and selected in-situ sampling.		
7.0.2 Plastic debris density	 This indicator measures a component of Target 7. Across the Headline Indicators, there is a gap for those of most relevance to the marine environment, so inclusion is welcomed. Gaps exist for measuring plastic pollution in terrestrial and freshwater ecosystems, as well as for measuring microplastics.	 A global dataset for national disaggregation is available for plastic debris on beaches (beach litter). Data for this metric is relatively straightforward to collect through sampling on beaches. However, there appears to be less availability of data for the other metrics, such as seafloor litter, included in this indicator. It will be important that reporting goes beyond beach litter to also include the other metrics suggested in SDG indicator 14.1.1b.	 Plastic pollution is a topic that has received considerable media attention and this indicator is likely to have high communication impact with diverse audiences (e.g., the comparison of fish weight to plastic weight).	**This may be better suited as a component indicator.**
7.0.3 Pesticide use per area of cropland	 Relevant to the Target 7 component on ‘amount of pesticides leached or lost to the environment’ (7.2). However, this metric does not account for the varying chemical properties and impacts on biodiversity of different substances applied. Reducing pesticide use does not necessarily indicate that we are reducing this to "levels that are not harmful to biodiversity" as per Target 7 wording.	 Global pesticide use estimations from FAO may not coincide with data reported by Parties. Many Parties already have national datasets for this indicator, which could be aggregated to the global level if an appropriate process was developed. The types and quantities of pesticides used varies, including by crop grown and biophysical conditions, amongst other factors, making international comparisons challenging.	 Pesticides receive considerable media attention, including for their links to human health, so this is likely to have high communication impact with diverse audiences.	**This may be better suited as a component or complementary indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
8.0.1 National green-house gas inventories from land use and land use change	 Relevant to land-based mitigation of climate change, which is an important driver of biodiversity loss. However, data is only provided for land regarded as managed land; unmanaged land often has important biodiversity and climate change adaptation and/or mitigation value. In addition, there is a gap for measuring the impacts of climate change on biodiversity and the value of biodiversity for adaptation.	 This data should be able to be directly lifted from existing UNFCCC reporting, and global data sets are near ready. Whilst only 44 Parties submitted GHG inventories to the UNFCCC in 2020, from 2023/24 all Parties will be expected to do so. GHG inventories do not currently include potential for seagrass and saltmarsh which could be important for some Parties.	 Climate change has strong public and political interest. However, this indicator may communicate little about the relationship between climate change and biodiversity.	**This may be better suited as a component indicator.**
9.0.1 National environmental-economic accounts of benefits from the use of wild species	 This is a disaggregation of the SEEA Ecosystem Accounts indicator used in headline indicator B.0.1. With current data availability, it would not be possible to provide a robust assessment of the benefits (i.e., livelihoods) from the use of wild species.	 This would be challenging for all Parties to report from national datasets. The priority ecosystem assets that countries choose to assess varies, as well as the quality of data. It is likely to be important that SEEA is further developed and implemented to allow confidence in the data availability. Inclusion beyond B.0.1 may therefore be over-confident in the indicator's applicability.	 The level of public or political resonance will depend on the metric produced. There is likely to be a lack of understanding of national environmental accounts.	**This may be better suited as a component indicator.**
10.0.1 Proportion of agricultural area under productive and sustainable agriculture	 Through 11 sub-indicators, this indicator captures the three	 Data collection is through farm surveys which would be costly and timely;	 Agriculture receives considerable media attention, so this is likely to have	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
	dimensions of sustainable production: economic, environmental, and social. For Target 10, a gap exists for measuring aquaculture outside of agricultural land areas. Relevance beyond measuring progress towards Target 10, including towards Goals A and B and Targets 7 and 21.	however, there is potential to use existing or alternative data sources, such as remote sensing and GIS, which can be more cost-effective and sometimes provide more reliable results than farm surveys. Such alternative data sources may also be used to complement and/or validate farm survey data.	high communication impact, and be easily communicated as a percentage figure of either national of global agricultural area.	
10.0.2 Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan)	 Composed of five sub-indicators that measure progress towards the three dimensions of sustainable forest management: economic, environmental, and social. However, if focus on one sub-indicator under SDG 15.2.1 is maintained ("Proportion of forest area under a long-term forest management plan"), this would fail to measure the other dimensions of sustainable forest management. Relevance of the full indicator beyond measuring progress towards Target 10, including towards Goals A and B and Targets 5 and 8.	 For sub-indicators 1-4, data are provided to FAO by the majority of countries and territories through an online platform, which is used for data entry, review and collation. For those remaining where no information is provided, a report is prepared by FAO using existing information and a literature search. For sub-indicator 5, data are annually reported by the certification bodies to FAO. Trends are calculated using only those countries which have data complete time series, so different sub-indicators may reflect different sets of countries.	 Forestry receives considerable media attention, so this is likely to have high communication impact, and be easily communicated as an overall percentage figure for sustainable forest management of either national of global forest area.	**Assessment supports inclusion as a headline indicator.**
11.0.1 National environmental-economic accounts of regulation of air quality, quality and quantity of water, and protection from	 This is a disaggregation of the SEEA Ecosystem Accounts indicator used in headline indicator B.0.1. With current data availability, it would not be	 This would be challenging for all Parties to report from national datasets. The priority ecosystem assets that countries choose to assess	 Depending on the presentation of this indicator, this may have public and political resonance. Whilst there is likely to be a lack of understanding of	**This may be better suited as a component indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
hazards and extreme events for all people, from ecosystems	possible to provide a robust assessment of the relevant ecosystem services in Target 11 (e.g., significant data are needed for risk-damage models to provide adequate results).	varies, as well as the quality of data. It is likely to be important that SEEA is further developed and implemented to allow confidence in the data availability. Inclusion beyond B.0.1 may therefore be over-confident in the indicator's applicability.	national environmental accounts, trends in particular ecosystem services in physical terms will be understood by diverse audiences and receive considerable media attention.	
12.0.1 Average share of the built-up area of cities that is green/blue space for public use for all	 Directly relevant to Target 12. However, whilst it encompasses access to green and blue spaces in urban areas, it does not capture their quality or potential human health benefits. The indicator also does not appear to capture within-country differences in access or the population living within proximity of the blue/green space.	 UN Habitat has developed a global dataset, which can be disaggregated to provide national data for Parties which have no national reporting in place. To calculate national data, remotely sensed datasets can be used which are available. Differences in population density between countries will not be captured by this indicator and thus should be considered to improve comparability.	 Access to green/blue space is likely to be easy to communicate to diverse audiences and have a high communication impact. However, it may communicate little about the relationship between green/blue space and biodiversity.	**This may be better suited as a component indicator.**
13.0.1 Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc*	 As currently worded, this indicator is broad enough to capture legislative, administrative and policy frameworks beyond the Nagoya Protocol. Development of such an indicator may help fill an important knowledge gap. In addition to Target 13, this indicator is directly relevant to Goal C.	 Further detail needs to be provided on this indicator for full evaluation.	 Further detail needs to be provided on this indicator for full evaluation.	**Implementation as a headline indicator would be subject to appropriate development and the provision of relevant guidance to Parties.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
14.0.1 Extent to which national targets for integrating biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies and accounts at all levels, ensuring that biodiversity values are mainstreamed across all sectors and integrated into assessments of environmental impacts	 Provides a direct measure for the component of Target 14 on integrating biodiversity values into policies, regulations, planning, development processes and poverty reduction strategies (14.1). Relevance beyond Target 14, including to Goal D and Target 15. However, gaps exist for measuring progress towards mainstreaming biodiversity into business models and key economic sectors, including the financial sector, as well as for mainstreaming biodiversity across society.	 Clarity is needed as to whether this headline indicators refers to a count of Parties (as per the SDG indicator 15.9.1a), or the extent of mainstreaming (as per current headline indicator 14.0.1 wording) which is a more qualitative, informative but challenging measure. A count of Parties is more technically and practically feasible to implement, and national data could be easily aggregated to the global level.	 There may be challenges with communicating this to diverse audiences. There is likely to be a lack of understanding of the value of, and language around, mainstreaming and a count of Parties conveys little information.	**This may be better suited as a component indicator.**
14.0.2 Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting	 Whilst this provides a direct measure for the component of Target 14 on integrating biodiversity into national accounts (14.2), a count of Parties implementing SEEA-EA does not provide a strong measure of progress towards the overall scope of the GBF.	 As this is a count of Parties implementing SEEA-EA, data can be easily aggregated to the global level. Results of the Global Assessment of Environmental-Economic Accounting and Supporting Statistics provide the data needed for this indicator. However, findings are not currently reported for all Parties.	 This is unlikely to facilitate high-level communication. There is likely to be a lack of understanding of the value of implementing SEEA-EA, and a count of Parties conveys little information.	**This may be better suited as a component indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
15.0.1 Dependencies and impacts of businesses on biodiversity	 As currently worded, this indicator is directly relevant to Goal D and Targets 14 and 15. However, this will be dependent on the final methodology for this indicator, including what is in scope for measuring 'dependencies' and 'impacts'.	 If the indicator relies on businesses self-reporting, then the quality/amount of data received may vary. Translating the assessment into multiple languages has been cited as a concern for reporting to SDG 12.6.1. However, it is unclear how closely HI 15.0.1 will align with SDG indicator 12.6.1 and this indicator may place significant burdens on businesses.	 The role of businesses in biodiversity loss is likely to have strong public and political resonance. However, it is not clear what metrics will be produced through this indicator and how easy they would be to present and communicate.	**Implementation as a headline indicator would be subject to appropriate development and the provision of relevant guidance to Parties.**
16.0.1 Food waste index	 This provides a partial measure to the component on Target 16 on reducing waste and overconsumption (16.2). To capture more scope and be more globally relevant, the food loss index (SDG indicator 12.3.1.a) could be included alongside the food waste index (SDG indicator 12.3.1.b).	 Data are collected via questionnaires. Analysis of existing global coverage found that data coverage and the confidence levels of the existing data varied geographically.	 Food waste has strong resonance with diverse audiences. However, there may be presentational issues with communicating an index value. In addition, this indicator conveys little about the impact of food waste on biodiversity.	**This may be better suited as a component indicator.**
16.0.2 Material footprint per capita	 Provides a measure of progress towards Target 16, as well as relevance to Goal B. However, with a growing global population, the per capita value could be decreasing whilst	 Data are available for this indicator. However, data are currently more accurate for some Parties than others due to the quality of input-output tables, and that there are still some issues in terms of the harmonisation of	 The mass of consumption may be hard to communicate as an abstract concept. The suggested alternative indicator, proposed by the UK, on the	**Whilst this assessment supports inclusion as a headline indicator, the alternative proposed by the UK (see**

Proposed Headline Indicators[3]	***Strong measure of progress towards the overall scope of the GBF***	***Technically and practically feasible to implement***	***Potential to facilitate high-level communication to diverse audiences***	***Overall assessment***
	the total material footprint could be increasing.	different international input-output databases. OECD is leading efforts to improve harmonisation which will inform UNEP's approach for this SDG indicator.	environmental impacts of consumption (see Annex 3) may have stronger resonance with diverse audiences, showing the impact of consumption on the environment.	**Annex 3) provides a stronger measure of progress towards the overall scope of the GBF[5].**
17.0.1 Indicator of measures in place to prevent, manage and control potential adverse impacts of biotechnology on biodiversity taking into account human health tbc*	 As currently worded, this indicator is directly relevant to the Target but provides limited evidence on the broader scope of the GBF.	 Further detail needs to be provided on this indicator for full evaluation.	 Further detail needs to be provided on this indicator for full evaluation.	**Further detail needs to be provided on this indicator for full evaluation.**
18.0.1 Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated	 Directly relevant to Target 18, as well as Target 19 and Goal D. A gap exists for measuring financial support to particular sectors harmful to biodiversity, such as infrastructure and mining. Given the lack of a single internationally agreed definition of subsidies and countries' different approaches, work is needed to adapt this indicator, particularly on agreed	 As the CBD document states that the indicator will be *based* on the OECD methodology, it will be important to understand any methodological adaptations before passing final judgement. The OECD methodology can be easily applied in a cost-effective manner. National data can be aggregated to the global level, and national reporting/validation processes	 Subsidies and incentives that are harmful to biodiversity are likely to have strong public and political resonance. A value figure would be well understood by diverse audiences and easily communicated.	**Implementation as a headline indicator would be subject to appropriate development and the provision of relevant guidance to Parties.**

[5] The alternative 'global environmental impacts of consumption indicator' proposed by the UK (see Annex 3) is relevant beyond Target 16, including to Goals A and B and Target 14.

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
	definitions and the inclusion of biodiversity in the methodology.	exist. Different approaches would be needed for the marine and terrestrial environments, so this indicator may benefit from proposing disaggregation by terrestrial and marine.		
19.0.1 Official development assistance for biodiversity	 Together 19.0.1 and 19.02 provide a strong measure of progress towards Target 19 and Goal D. 'International financial flows to developing countries' for biodiversity is broader than ODA and thus this indicator should be supplemented by other indicators at the component or complementary level to account for such flows.	 This indicator is available and actively monitored by the OECD DAC, and reported as SDG indicator 15.a.1.	 International financial flows to developing countries is a topic that receives both public and political attention. The result of this indicator would be a single numerical figure globally and for each Party. This could be easily communicated, showing trends over time.	**Assessment supports inclusion as a headline indicator.**
19.0.2 Public expenditure and private expenditure on conservation and sustainable use of biodiversity and ecosystems	 Together 19.0.1 and 19.02 provide a strong measure of progress towards Target 19 and Goal D.	 Data for this HI is partly available now from the CBD, OECD and SEEA. Not all Parties currently report information to the CBD through the Financial Reporting Framework. Availability of data are expected to improve as Parties develop National Biodiversity Finance Plans or similar instruments. However, it is likely that collecting data on private expenditure will be more challenging than public expenditure.	 Public and private expenditure receives both public and political attention. The result of this indicator would be a numerical figure globally and for each Party This could be easily communicated, showing trends over time.	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	*Strong measure of progress towards the overall scope of the GBF*	*Technically and practically feasible to implement*	*Potential to facilitate high-level communication to diverse audiences*	*Overall assessment*
20.0.1 Indicator on biodiversity information and monitoring, including traditional knowledge, for management*	 As currently worded, the indicator appears to be relevant to the Target. However, there may be challenges as to how this indicator is applied and implemented, particularly around selecting appropriate information in different contexts. In addition, currently, there is no mention of knowledge arising from "innovations and practices of indigenous and local communities with their free, prior, and informed consent", nor promoting "awareness" and "education".	 Further detail needs to be provided on this indicator for full evaluation.	 Further detail needs to be provided on this indicator for full evaluation.	**Further detail needs to be provided on this indicator for full evaluation.**
21.0.1 Indicator on the degree to which indigenous peoples and local communities, women and girls as well as youth participate in decision-making related to biodiversity tbc*	 The wording of this indicator suggests that it would reflect most components of the target, encompassing IPLC (21.1), women and girls (21.2), and youth (21.3). However, it is unclear how this indicator will be developed.	 Further detail needs to be provided on this indicator for full evaluation.	 Whilst it is unclear exactly what this indicator will measure, inclusive decision making is a topic that is likely to be easily communicated and of interest to diverse audiences.	**Assessment supports inclusion as a headline indicator.**
21.0.2 Land tenure in the traditional territories of indigenous peoples and local communities	 Directly relevant to Target 21, as well as the overall scope of the GBF,	 Ensuring alignment to SDG indicator 1.4.2 may make this more feasible to implement as data are already being	 Land tenure is a topic which receives strong public and political attention. Communicating a percentage figure is	**Assessment supports inclusion as a headline indicator.**

Proposed Headline Indicators[3]	***Strong measure of progress towards the overall scope of the GBF***	***Technically and practically feasible to implement***	***Potential to facilitate high-level communication to diverse audiences***	***Overall assessment***
	including Goals B and D and Target 3 and 9.	collected by UN Habitat. Collecting further data at the national level may be challenging for Parties with limited resources as the indicator relies on household surveys.	also likely to be understood by diverse audiences, provided there is a clear denominator.	

Annex 2 – UK proposed protected area management effectiveness indicator

Context

Enhancing the quality of protected areas (PA) depends on effective management which delivers stated conservation objectives. The current proposed indicator (3.3.1) for assessing PA management effectiveness is based on the PAME framework and utilises the World Database on Protected Areas (WDPA). Component indicator 3.3.1 measures the number of assessments of management effectiveness that have been completed. While this is a key starting point it does not provide an assessment for how effective a PA is and rather focuses on whether or not a PA effectiveness assessment process is in place.

This proposal builds on existing approaches for PA management effectiveness by developing a new component indicator that provides an assessment of how effective PA management is in a proportionate way that has global application.

Development of the new indicator

The indicator has been developed building on the existing approach used by the OSPAR Regional Seas Convention, which has been successfully applied for the past four years across all MPAs in the NE Atlantic. Each of the four qualitative OSPAR questions were transformed to quantitative metrics and then complemented by an additional four metrics to provide key information on the type of PA, its governance and confidence in achievement of conservation objectives. Weightings were then applied to:

a) Ensure achievement of conservation objectives has greatest influence on overall indicator score

b) Account for the differences between community-led PAs and Government-led PAs

Indicator trialling and next steps

To date the new indicator has been trialled on PAs in Canada, Costa Rica and the NE Atlantic (Germany, Spain, Sweden and the UK). Next steps:

- Trial the indicator using additional areas, PA types and OECMs, and governance types
- Explore using PAME data alongside additional sources to trial the indicator
- Review application of weightings during further testing
- Integrate this proposed component indicator with two other component indicators (PA coverage and OECM coverage) to create a headline indicator for coverage and effectiveness of PAs and OECMs

Further detail, including a progress summary report, can be found in 'Submission from the UK on progress made in the in the development of a new globally applicable indicator of Protected Area Management Effectiveness'.

Annex 3 – UK proposed global environmental impacts of consumption indicator: metadata sheet

This metadata sheet has been produced by the UK Joint Nature Conservation Committee (JNCC) in the style of the metadata sheets prepared by the Secretariat for proposed headline indicators for the post-2020 global biodiversity framework.

Further information on this indicator can be found in the INF document titled: 'Measuring the environmental impacts of consumption: a global indicator of the deforestation, biodiversity loss and scarcity weighted water use associated with the consumption of crop commodities'.

Indicator metadata sheet v1.0

1. Indicator name

Global environmental impacts of consumption https://www.commodityfootprints.earth/

2. Date of metadata update

February 2022

3. Goals and Targets addressed

3.a Goals

Goal A. The integrity of all ecosystems is enhanced, with an increase of at least 15 per cent in the area, connectivity and integrity of natural ecosystems, supporting healthy and resilient populations of all species, the rate of extinctions has been reduced at least tenfold, and the risk of species extinctions across all taxonomic and functional groups, is halved, and genetic diversity of wild and domesticated species is safeguarded, with at least 90 per cent of genetic diversity within all species maintained.

Goal B. Nature's contributions to people are valued, maintained or enhanced through conservation and sustainable use supporting the global development agenda for the benefit of all.

3.b Target

Target 14. Fully integrate biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values.

Target 16. Ensure that people are encouraged and enabled to make responsible choices and have access to relevant information and alternatives, taking into account cultural preferences, to reduce by at least half the waste and, where relevant the overconsumption, of food and other materials.

4. Rationale

Unsustainable overconsumption of food and other materials is linked to significant production-related environmental impacts, such as deforestation, land use change, biodiversity loss and water stress (Target 16). Consumers are often far removed from these impacts, at the other end of supply chains which may span many different countries. This makes it difficult for individuals, companies, Governments and other actors to make responsible choices and have access to relevant information about the environmental impacts of their consumption (Target 16). Furthermore, impacts may differ in their severity depending on the type and location of material extraction and/or resource use, meaning that quantifying material dependencies (i.e., Material Footprint indicators) is insufficient to understand sustainability-linked impacts linked to consumption activities. This indicator provides information on the estimated tropical deforestation, biodiversity loss and scarcity-weighted water use associated with a country's consumption of agricultural commodities. Results can be broken down by the commodity associated with the impact, and by the country in which production of the commodity is taking place. The tropical deforestation and biodiversity loss aspects of the indicator also support assessing progress towards Goal A. The indicator also supports the assessment of environmental impacts at all levels of government and across all sectors of the economy, thereby also supporting Target 14.

5. Definitions, concepts and classifications

5.a Definition:

Tropical deforestation: Deforestation data from the Pendrill et al, 2020 dataset are used to proportionally attribute a consumption country's deforestation impacts based on the volumes of each commodity the country consumes from each production country. The Pendrill deforestation definition is based on observed forest loss, from remote sensing data (from GLAD/Hansen - at 30m resolution, with a threshold of 25% canopy cover used to define forest, and complete loss per pixel defined as 'forest loss'). A land balance model (described in Pendrill et al, 2019, a, b) is used to attribute deforestation to commodity production. **Unit:** *Hectares.*

Biodiversity loss: Data are currently available for two separate biodiversity metrics that were published as part of the initial data release (October 2021). Work is ongoing to identify the most appropriate biodiversity metric for use in this context, and it is planned that the autumn 2022 release will be based on an updated methodology (i.e., using a different metric to the current two). One of the two metrics for which data are currently available uses crop- and country-specific characterisation factors, provided by Chaudhary and Kastner (2016), which are used to estimate the impact per tonne of production for 152 crops/crop groups in 171 territories. **Unit:** *Number of species per ecoregion committed to extinction.* The other method to estimate biodiversity loss in the data that is currently available uses MAPSPAM data alongside species richness information from the International Union for the Conservation of Nature (IUCN) and BirdLife International to estimate 'species richness-weighted extent of crop production'. This represents the hectares of crop production scaled by the number of species present in that hectare, and therefore where there is overlap between production and areas of biodiversity importance. **Unit:** *Species-weighted hectares.*

Scarcity weighted water use: Water footprints were estimated from the Water Footprint Network baseline data, which is annualised to account for changes in crop yields over time. To account for water scarcity in regions of production, blue (irrigated) water consumption was then scaled by water availability in a region after human and aquatic ecosystem demand has been met, using conversion factors sourced from Boulay et al. (2018). **Unit:** *Cubic metres.*

Note: The indicator also presents data on mass, land use, water use, GHG emissions associated with tropical deforestation, but a shortened, simplified set is presented here for use as a headline indicator for monitoring progress towards the post-2020 global biodiversity framework. Further information on these other impact types is available from the dashboard and the technical documentation.

5.b Method of computation

Full technical information providing all relevant details about how the indicator is calculated is available: https://hub.jncc.gov.uk/assets/91efc19d-f675-426f-9333-ed0195cc729d

In brief, the indicator is based on multi regional input-output (MRIO) modelling, which is used to model global trade flows representing the monetary inputs and outputs across different countries and their commercial sectors (e.g., oilseeds, cattle farming, paddy rice, etc.). The MRIO data used for this indicator were from Exiobase. The MRIO data are hybridised with physical production, processing and trade data (tonnes of each commodity) from the Food and Agricultural Organisation, using the Stockholm Environment Institute's Input Output Trade Analysis (IOTA) modelling framework (Croft et al., 2018). The modelling framework allows for an estimation of the country of origin of a commodity, accounting for cases where commodities are embedded within other products as an ingredient or input, and cases where commodities are re-exported through multiple countries before the point of consumption.

This data is then combined with datasets linking commodity production to environmental impacts within relevant production countries. For tropical deforestation, this is the Pendrill et al., 2020 dataset. For biodiversity loss, this is currently data from Chaudhary and Kastner (2016) for the species loss metric, and data from MAPSPAM, Birdlife International, and the International Union for the Conservation of Nature for the species weighted hectares metric. For scarcity weighted water use, this was data from the Water Footprint Network and Boulay et al. (2018).

The IOTA framework is designed to be 'modular' so that alternative datasets (e.g. alternative MRIO models, alternative environmental indicators) can be utilised to extend analysis and allow intercomparison across datasets.

5.c Data collection method

National authorities from countries included in the consumption dataset can report on the data directly as provided via https://commodityfootprints.earth/

At the current time, only 44 selected countries of consumption are available, with other countries aggregated under five 'rest of world regions'. An application with an alternative MRIO database (GTAP) is being prepared currently and will extend the number of countries of consumption covered by the indicator to 120.

5.d Accessibility of methodology

The indicator methodology and underlying data are published at: https://hub.jncc.gov.uk/assets/91efc19d-f675-426f-9333-ed0195cc729d and https://commodityfootprints.earth/#data These were produced following the UK's Code of Practice for Statistics and the relevant review processes required by this. Croft et al. 2018 provides a peer-reviewed methodological summary of the core techniques used to generate this data.

Much of the underlying methodology that is brought together into the overall indicator framework (Croft et al, 2018; Pendrill et al, 2019 a,b; Chaudhary and Kastner, 2016; Boulay et al, 2018) has been published in peer reviewed journals (see references section).

5.e Data sources

Initial data are available now from https://www.commodityfootprints.earth/. It is planned that the indicator will continue to undergo development for the next two to three years. This development will include improving understanding of which biodiversity metric(s) and data are most appropriate to combine with the economic data (i.e., the current metrics of species loss and species weighted hectares may change) and further disaggregation of 'rest of world' regions to national level data. There is a time lag in the data due to the underlying economic data, with the latest year available at the point of publishing in 2021 being 2017 (2018 data are due to be made available this year, with input datasets to enable this already available). It is planned that the indicator will be updated annually.

5.f Availability and release calendar

A global dataset, providing indicator data for 44 countries and 5 'rest of world' regions (aggregations of remaining countries), is available from https://commodityfootprints.earth/ Development work to update this to include 120 countries and 20 'rest of world' regions is underway. Underlying data that feeds into this dataset is available from the sources listed in sections 5 a and b of this metadata sheet.

5.g Time series

Data are currently available for 2005-2017.

5.h Data providers

Data provided at https://commodityfootprints.earth/ is produced by the Stockholm Environment Institute at the University of York and the Joint Nature Conservation Committee (a UK government agency). Development work was funded and commissioned by Defra, with additional support given towards the dashboard by the Trade Hub and Trase.

5.i Data compilers

Compilation and reporting at the global level is conducted by the Stockholm Environment Institute at the University of York and the Joint Nature Conservation Committee (a UK public body). Relevant national authorities can use the data available at https://commodityfootprints.earth/ to compile national reports.

5.j Gaps in data coverage

Geographic: Currently, data are available for 44 countries from a consumption perspective (although all countries as recorded by FAO are available from a production perspective). Data are available for 5 'rest of world' regions, consisting of aggregates of remaining countries. Development work to update this to include 120 countries and 20 'rest of world' regions is under discussion.

Commodity coverage: For the biodiversity loss and scarcity weighted water use metrics, data are only available for crop commodities. For the deforestation metric, data are available for crop commodities, timber and cattle related commodities. The potential for adding metals and mineral, and marine commodities is being explored but to date remains a data gap.

Metric types: There are many different types of environmental impact from unsustainable consumption that affect biodiversity, beyond deforestation, biodiversity loss metrics based on land use change, and water stress. Data are also available from the dashboard on mass, land use, water use, GHG emissions associated with tropical deforestation. However, other impact types, especially those most associated with intensive agriculture, such as nitrogen and phosphorous pollution, are not currently included. Development work to explore adding such metrics in future is planned.

5.k Treatment of missing values

For production and trade data, data gaps are left blank. In many cases, this is due to a combination of not knowing if “gaps” are really gaps or whether they genuinely represent zero trade. For production, this means that no production/impacts are assigned to a given commodity/country pairing. Within the trade data, there are some cases where no trade data are present, but it is known that, in reality, trade takes place because some countries might not report their trade data fully.

Currently these are just left blank, and the MRIO is used to estimate all trade in these cases. In future, it will be possible to utilise additional trade data and methodologies to “reconcile” the trade data and fill these gaps, e.g., by combining export and import records, but this was beyond the scope of the initial release.

Whilst not all countries are explicitly covered within the MRIO (44 individual countries are currently represented within EXIOBASE), any remaining countries are represented within one of five “Rest of World” regions, and therefore their chains (from a producer, intermediary and consumption perspective) are captured and considered, albeit at reduced geographic resolution.

Details on how the data are captured, and how some missing values are imputed, in the underlying production and trade datasets from FAO can be found here: https://fenixservices.fao.org/faostat/static/documents/QCL/QCL_methodology_e.pdf and https://fenixservices.fao.org/faostat/static/documents/TM/TM_e.pdf

Detail on the production of the EXIOBASE MRIO utilised can be found here: https://onlinelibrary.wiley.com/doi/10.1111/jiec.12715

For the environmental indicators themselves, different approaches are adopted in the cases of data gaps, as explained below:

- Cropland area harvested: where no data are available, entries are left as zero value.
- Deforestation and associated emissions: where no data are available, entries are left as zero value.
- Water footprint and scarcity:
    - If annualised data for a country/commodity are missing, a value is adopted from a “nearest neighbour” within ten angular degrees.
    - If none is available, non-annualised data are adopted for the focal country, and if not available again from a nearest neighbour within ten angular degrees.
    - If this yields no value, a global average for the crop from the original reference period is adopted.
    - If no global average is available, the entry is left blank.
    - Across all of these stages of data substitution, values are only adopted if data are available for both blue and green water.
- Biodiversity – predicted species loss: where no data are available, entries are left as zero value.
- Biodiversity – species richness weighted hectares: where no data are available, entries are left as zero value. However, application of this indicator depends on land use data, so if no land area data are available within FAOSTAT for a given country/commodity/year, an estimate is derived from global average yields.

6 Scale

6.a Scale of use

Data are provided at the global scale. It is possible to disaggregate this to a regional scale. For 44 countries (and with further development for 120 countries) data has been disaggregated for national use.

6.b National/regional indicator production

The global dataset is presented with national disaggregation built in already for 44 countries (with further development allowing for expansion to 120 countries), and other countries grouped regionally into several 'rest of world' regions. This data can be accessed directly from https://commodityfootprints.earth/ as a national indicator.

The data is already in use as a national indicator for the UK (UK Biodiversity Indicator A4: https://jncc.gov.uk/our-work/ukbi-a4-global-biodiversity-impact/).

6.c Sources of differences between global and national figures

N/A – the global total would be a sum of the national totals and the 'rest of world' region totals.

6.d Regional and global estimates & data collection for global monitoring

6.d.1 Description of the methodology

No weighting applied – the global total would simply be produced by summing the national totals and the 'rest of world' region totals.

6.d.2 Additional methodological details

N/A

6.d.3 Description of the mechanism for collecting data from countries

N/A

7 Other MEAs, processes and organisations

Data are collected by the Stockholm Environment Institute at the University of York and the Joint Nature Conservation Committee (a UK public body) from internationally published data sources as described in sections 5 a and b of this metadata sheet. National authorities can collect the analysed data directly from https://commodityfootprints.earth/

7.a Other MEA and processes

No

7.b Biodiversity Indicator Partnership

No

8 Disaggregation

Geographic (consumption perspective): 44 countries and 5 rest of world regions (with further development work planned to bring the total to 120 countries and 20 rest of world regions).

Geographic (production perspective): 197 countries

Commodity breakdown: 162 commodities for the deforestation metric, 160 commodities for the biodiversity loss and scarcity weighted water use metrics.

9. Related indicators

This indicator relates to the currently proposed Material Footprint per capita indicator, which also aims to provide a measure of the sustainability of consumption. The key differences are:

- The global environmental impacts of consumption indicator provides estimates of the *impacts* associated with consumption (i.e. the tropical deforestation, biodiversity loss and scarcity weighted water use associated with consumption), rather than simply the *volume* of consumption. Impacts may differ in their severity depending on the type and location of material extraction and/or resource use, meaning that quantifying material dependencies (i.e., Material Footprint indicators) is insufficient to understand sustainability-linked impacts linked to consumption activities.
- The commodity scope of the global environmental impacts of consumption indicator is currently restricted to agricultural crop products (although the deforestation metric also includes cattle related commodities and timber), whereas the Material Footprint covers all consumption. However, further developments to the global environmental impacts of consumption indicator may allow for the addition of metals and minerals, as well as marine commodities.
- The global environmental impacts of consumption indicator allows for a detailed breakdown of impact per commodity and per producing country, making it ideal for identifying hotspots where action is most needed (i.e. going beyond a simply indicator to be able to inform action). In contrast, the Material Footprint presents aggregated results by sector.

10. Data reporter

10.a Organisation

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10.b Contact person(s)

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11. References

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Additional references to underlying data are provided within the technical documentation.

Annex 4 – Relevance of headline indicator(s) included in the UK cluster proposal to goals and targets in the First Draft of the Post-2020 GBF

This Submission recognises that headline indicators can provide information on progress related to more than one goal and/or target. The table below illustrates this, by mapping headline indicator(s) included in the UK cluster proposal (Diagram 2) to the goals and targets proposed in the First Draft of the Post-2020 GBF. The linkages are not exhaustive, and we recognise that some headline indicators are more relevant to particular goals/targets than others.

To measure progress towards all components of the goals and targets, headline indicators would need to be supplemented by component, complementary and/or other national indicators, as appropriate.

Goal/Target in the First Draft of the Post-2020 GBF	***Relevant headline indicator(s) included in the cluster proposal***
Goal A. The integrity of all ecosystems is enhanced, with an increase of at least 15% in the area, connectivity and integrity of natural ecosystems, supporting healthy and resilient populations of all species, the rate of extinctions has been reduced at least tenfold, and the risk of species extinctions across all taxonomic and functional groups, is halved, and genetic diversity of wild and domesticated species is safeguarded, with at least 90% of genetic diversity within all species maintained.	**A.0.1** Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats) **A.0.3** Red List Index **A.0.4** The proportion of populations within species with a genetically effective population size > 500 **2.0.1** Percentage of degraded or converted ecosystems that are under restoration **3.0.1** Coverage of Protected areas and OECMS (by effectiveness) **5.0.2** Proportion of fish stocks within biologically sustainable levels **10.0.1** Proportion of agricultural area under productive and sustainable agriculture **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan) Global environmental impacts of consumption (alternative proposed by the UK; see **Annex 3**)
Goal B. Nature's contributions to people have been valued, maintained or enhanced through conservation and sustainable use supporting the global development agenda for the benefit of all.	**B.0.1** National environmental economic accounts of ecosystem services* **5.0.2** Proportion of fish stocks within biologically sustainable levels **7.0.1** Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries) **10.0.1** Proportion of agricultural area under productive and sustainable agriculture **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan) **15.0.1** Dependencies and impacts of businesses on biodiversity

Goal/Target in the First Draft of the Post-2020 GBF	***Relevant headline indicator(s) included in the cluster proposal***
	Global environmental impacts of consumption (alternative proposed by the UK; see **Annex 3**) **21.0.2** Land tenure in the traditional territories of indigenous peoples and local communities
Goal C. The benefits from the utilization of genetic resources are shared fairly and equitably, with a substantial increase in both monetary and non-monetary benefits shared, including for the conservation and sustainable use of biodiversity.	**13.0.1** Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc*
Goal D. The gap between available financial and other means of implementation, and those necessary to achieve the 2050 Vision, is closed.	**15.0.1** Dependencies and impacts of businesses on biodiversity **18.0.1** Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated **19.0.1** Official development assistance for biodiversity **19.0.2** Public expenditure and private expenditure on conservation and sustainable use of biodiversity and ecosystems **21.0.2** Land tenure in the traditional territories of indigenous peoples and local communities
Target 1. Ensure that all land and sea areas globally are under integrated biodiversity-inclusive spatial planning addressing land- and sea-use change, retaining existing intact and wilderness areas.	**A.0.1** Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats) **3.0.1** Coverage of Protected areas and OECMS (by effectiveness) **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan)
Target 2. Ensure that at least 20% of degraded freshwater, marine and terrestrial ecosystems are under restoration, ensuring connectivity among them and focusing on priority ecosystems.	**A.0.1** Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats) **2.0.1** Percentage of degraded or converted ecosystems that are under restoration
Target 3. Ensure that at least 30% globally of land areas and of sea areas, especially areas of particular importance for biodiversity and its contributions to people, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected	**3.0.1** Coverage of Protected areas and OECMS (by effectiveness) **A.0.1** Extent of selected natural and modified ecosystems (i.e. forest, savannahs and grasslands, wetlands, mangroves, saltmarshes, coral reef, seagrass, macroalgae and intertidal habitats)

Goal/Target in the First Draft of the Post-2020 GBF	***Relevant headline indicator(s) included in the cluster proposal***
areas and other effective area-based conservation measures and integrated into the wider landscapes and seascapes.	**10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan) **21.0.2** Land tenure in the traditional territories of indigenous peoples and local communities
Target 4. Ensure active management actions to enable the recovery and conservation of species and the genetic diversity of wild and domesticated species, including through ex situ conservation, and effectively manage human-wildlife interactions to avoid or reduce human-wildlife conflict.	**A.0.3** Red List Index **A.0.4** The proportion of populations within species with a genetically effective population size > 500 **2.0.1** Percentage of degraded or converted ecosystems that are under restoration **5.0.2** Proportion of fish stocks within biologically sustainable levels
Target 5. Ensure that the harvesting, trade and use of wild species is sustainable, legal, and safe for human health.	**5.0.2** Proportion of fish stocks within biologically sustainable levels **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan)
Target 6. Manage pathways for the introduction of invasive alien species, preventing, or reducing their rate of introduction and establishment by at least 50%, and control or eradicate invasive alien species to eliminate or reduce their impacts, focusing on priority species and priority sites.	**A.0.3** Red List Index
Target 7. Reduce pollution from all sources to levels that are not harmful to biodiversity, ecosystem functions or human health, including by reducing nutrients lost to the environment by at least half, and pesticides by at least two thirds and eliminating the discharge of plastic waste.	**7.0.1** Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries) **10.0.1** Proportion of agricultural area under productive and sustainable agriculture **15.0.1** Dependencies and impacts of businesses on biodiversity
Target 8. Minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 GtCO2e per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts	**B.0.1** National environmental economic accounts of ecosystem services* **2.0.1** Percentage of degraded or converted ecosystems that are under restoration **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan)

Goal/Target in the First Draft of the Post-2020 GBF	***Relevant headline indicator(s) included in the cluster proposal***
avoid negative impacts on biodiversity.	
Target 9. Ensure benefits, including nutrition, food security, medicines, and livelihoods for people especially for the most vulnerable through sustainable management of wild terrestrial, freshwater and marine species and protecting customary sustainable use by indigenous peoples and local communities.	**B.0.1** National environmental economic accounts of ecosystem services* **5.0.2** Proportion of fish stocks within biologically sustainable levels **10.0.1** Proportion of agricultural area under productive and sustainable agriculture **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan) **13.0.1** Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc* **21.0.2** Land tenure in the traditional territories of indigenous peoples and local communities
Target 10. Ensure all areas under agriculture, aquaculture and forestry are managed sustainably, in particular through the conservation and sustainable use of biodiversity, increasing the productivity and resilience of these production systems.	**10.0.1** Proportion of agricultural area under productive and sustainable agriculture **10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan) **7.0.1** Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries)
Target 11. Maintain and enhance nature's contributions to regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people	**B.0.1** National environmental economic accounts of ecosystem services* **2.0.1** Percentage of degraded or converted ecosystems that are under restoration **7.0.1** Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries)
Target 12. Increase the area of, access to, and benefits from green and blue spaces, for human health and well-being in urban areas and other densely populated areas.	*Measured by component, complementary or other national indicators, as appropriate.*
Target 13. Implement measures at global level and in all countries to facilitate access to genetic resources and to ensure the fair and equitable sharing of benefits arising from the use of genetic resources and, as relevant, of associated traditional knowledge, including through mutually agreed terms and prior and informed consent.	**13.0.1** Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc*

Target 14. Fully integrate biodiversity values into policies, regulations, planning, development processes, poverty reduction strategies, accounts, and assessments of environmental impacts at all levels of government and across all sectors of the economy, ensuring that all activities and financial flows are aligned with biodiversity values.	**15.0.1** Dependencies and impacts of businesses on biodiversity Global environmental impacts of consumption (alternative proposed by the UK; see **Annex 3**) **18.0.1** Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated
Target 15. All businesses (public and private, large, medium and small) assess and report on their dependencies and impacts on biodiversity, from local to global, and progressively reduce negative impacts, by at least half and increase positive impacts, reducing biodiversity-related risks to businesses and moving towards the full sustainability of extraction and production practices, sourcing and supply chains, and use and disposal.	**15.0.1** Dependencies and impacts of businesses on biodiversity Global environmental impacts of consumption (alternative proposed by the UK; see **Annex 3**)
Target 16. Ensure that people are encouraged and enabled to make responsible choices and have access to relevant information and alternatives, taking into account cultural preferences, to reduce by at least half the waste and, where relevant the overconsumption, of food and other materials.	Global environmental impacts of consumption (alternative proposed by the UK; see **Annex 3**)
Target 17. Establish, strengthen capacity for, and implement measures in all countries to prevent, manage or control potential adverse impacts of biotechnology on biodiversity and human health, reducing the risk of these impacts.	*Measured by component, complementary or other national indicators, as appropriate.*
Target 18. Redirect, repurpose, reform or eliminate incentives harmful for biodiversity, in a just and equitable way, reducing them by at least 500 billion per year, including all of the most harmful subsidies, and ensure that incentives, including public and private economic and regulatory incentives, are either	**18.0.1** Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated

positive or neutral for biodiversity implementation, commensurate with the ambition of the goals and targets of the framework.	
Target 19. Increase financial resources from all sources to at least 200 billion per year, including new, additional and effective financial resources, increasing by at least 10 billion per year international financial flows to developing countries, leveraging private finance, and increasing domestic resource mobilization, taking into account national biodiversity finance planning, and strengthen capacity building and technology transfer and scientific cooperation, to meet the needs for implementing the post-2020 global biodiversity framework	**19.0.1** Official development assistance for biodiversity **19.0.2** Public expenditure and private expenditure on conservation and sustainable use of biodiversity and ecosystems **18.0.1** Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated
Target 20. Ensure that relevant knowledge, including the traditional knowledge, innovations and practices of indigenous and local communities with their free, prior, and informed consent, guides decision making for the effective management of biodiversity, enabling monitoring, and by promoting awareness, education and research.	**10.0.2** Progress towards sustainable forest management (Proportion of forest area under a long-term forest management plan) **13.0.1** Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc* **21.0.1** Indicator on the degree to which indigenous peoples and local communities, women and girls as well as youth participate in decision-making related to biodiversity tbc* **21.0.2** Land tenure in the traditional territories of indigenous peoples and local communities
Target 21. Ensure equitable and effective participation in decision-making related to biodiversity by indigenous peoples and local communities, and respect their rights over lands, territories and resources, as well as by women and girls, and youth.	**21.0.1** Indicator on the degree to which indigenous peoples and local communities, women and girls as well as youth participate in decision-making related to biodiversity tbc* **21.0.2** Land tenure in the traditional territories of indigenous peoples and local communities **10.0.1** Proportion of agricultural area under productive and sustainable agriculture **13.0.1** Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on PIC and MAT tbc*