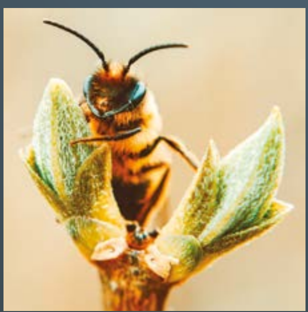
EXPERTISE AND SYNTHESIS



The post-2020 Global biodiversity framework

Analysis of the draft framework by FRB

FRB
FONDATION
POUR LA RECHERCHE
SUR LA BIODIVERSITÉ

The post-2020 Global biodiversity framework - Analysis of the draft framework by FRB

About this document

This document was prepared by the French Foundation for Biodiversity Research (FRB) at the request of the Foreign Affairs Ministry. Its objective is to provide a scientific viewpoint on the items discussed by the Convention on Biological Diversity (CBD), prior to the adoption of a post-2020 Global biodiversity framework. It focuses on the "sticking points" that are anticipated during negotiation sessions.

In this document, we study the relevance, in the light of the most recent scientific work, of the strategic goals, targets and indicators proposed in the revised draft framework and its different successive versions (CBD/WG2020/3/3 [1] and the document CBD/WG2020/3/3Add.1 [2] for the monitoring framework related to this strategy, both documents date from July 2021).

1. https://www.cbd.int/doc/c/db88/d435/3dd90f9fc8b285509c63d9b2/wg2020-03-03-fr.pdf
2. https://www.cbd.int/doc/c/953f/4230/e76296af9be155b3cd6ab167/wg2020-03-03-add1-fr.pdf

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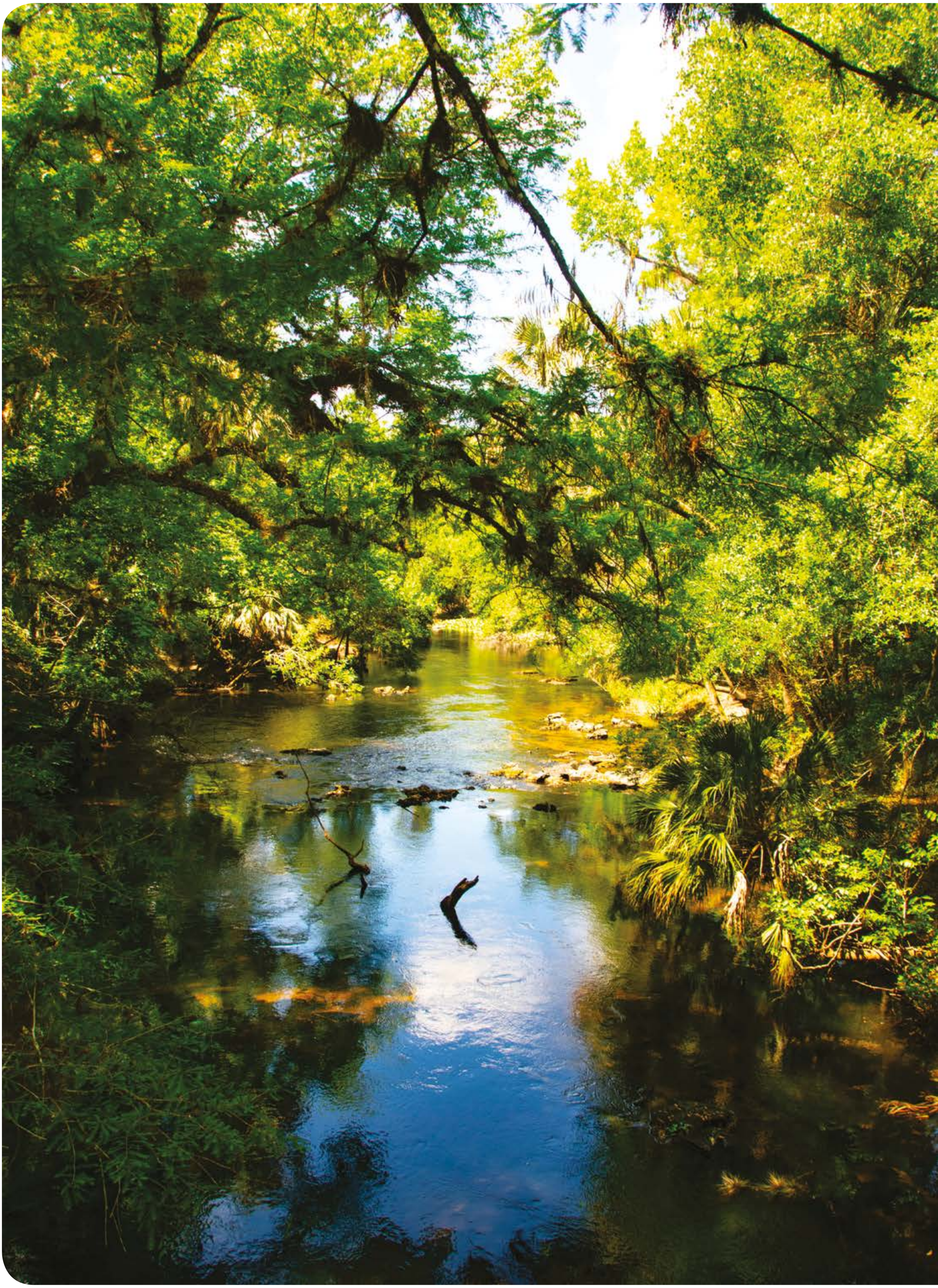


1. Different aspects of biodiversity to consider in the draft global framework

1.1 Pressures on biodiversity

Giant steps towards **recognition of pressures on biodiversity** were taken during the year 2019, thanks to the global assessment carried out by IPBES. Notably, the prospective works (IPBES, ScenEnvi, Visions of the future and the environment, AllEnvi [1]) suggested that erosion of biodiversity and loss of the services humanity draws from ecosystems will continue at least until 2050, because of the continuance of demographic growth and consumer practices linked to higher living standards.

However, **provided that significant efforts are made quickly well in advance of 2030**, it seems that several scenarios could lead to success in the fight to restore biodiversity from 2050 onwards. They require States and other stakeholders (local authorities, businesses and citizens) to engage **in effective reduction of the pressures** on biodiversity by the 2030 deadlines. IPBES has identified and classified these pressures in order of importance (see **Brochure FRB – évaluation mondiale de l'IPBES : Des scénarios qui ne doivent pas s'arrêter à 2050** [2]). Before the *Zero Order Draft* of the framework was published, the FRB recommended, on this basis, that the targets should focus on reducing human pressures on biodiversity. These pressures are easier to identify and measure than the improvement in the state of biodiversity, which requires a significant number of field observations of taxa, biomes and flows within and between ecosystems and a definition of what would constitute a "good state" and the "baseline state".

1.2 Content of the draft framework

Although the post-2020 framework did not adopt a pressure driver approach, these aspects may be observed in targets 1 to 8, which focus on reduction of threats to biodiversity. Targets 9 to 12 address contributions from nature to people, and pressure drivers are identified as obstacles to these contributions. Targets 14 to 21 address implementation of the strategic framework and deal with indirect drivers of biodiversity loss (notably production methods and consumer practices).

In the version of the future strategy currently under negotiation, the major objectives focus on the different dimensions of biodiversity (genetic, specific and ecosystem) and the three CBD objectives (protection, sustainable use and benefit sharing). In the proposed framework, eight targets focus on the objective of protection, four on sustainable use of biodiversity and one on the access and benefit sharing system (ABS). One of the first remarks is that sharing the benefits of biodiversity and equitable access to resources are centred on genetic resources. In the context of the CBD, it is the Nagoya Protocol which addresses this matter. The protocol had mixed results (low financial gains for Southern countries. The picture of possible advantages from genetic resources is doubtless distorted). By not questioning the ABS conceptual framework (through widening the sharing of benefits from biodiversity and ecosystem services, as well as genetic resources, for example), the global framework misses essential issues such as imported impacts, monopolising of resources (land, water and biomass) and underlying economic and political mechanisms at all levels (national, regional and global).

Equity issues, which are major conditions to ensure the success of biodiversity protection policies, may not, however, be limited simply to the Nagoya Protocol, addressed in target 13. The sharing of benefits from the use of biodiversity is a framework-wide objective. It is mentioned explicitly to varying degrees in targets 21 (fair and equitable participation in decision-making, particularly for women, young people and indigenous populations), 18 (reform or fair and equitable elimination of harmful subsidies), 19 (increase of resource, technology and scientific cooperation flows towards developing countries), 14 (integration of the various forms of biodiversity-related value). Targets 15 (increasing business sustainability) and 16 (support for responsible choices by citizens) also include the issue of fair and equitable sharing of the benefits from biodiversity. Similarly, these principles of sharing and equity must be the focus of the targets addressing production and the distribution of nature's contributions to people covered by targets 8 to 12.

1. https://www.allenvi.fr/allenvi/actualites/archives2/actualites-2011-2020/2017/scenenvi-futurs-pour-la-planete
2. https://www.fondationbiodiversite.fr/wp-content/uploads/2019/11/IPBES-Depliant-Rapport-2019.pdf

1.3 Analysis by ecosystem services and biodiversity-related values

In order to finetune this view, we have analysed the relevance of the proposed global framework in two additional directions: ecosystem service categories (or nature's contributions to people), and the biodiversity values related to the proposed actions.

The diversity of ecosystem services is relatively well covered between the different targets and objectives, apart from cultural services, which are often under-represented in the wording of the texts.

Diversity in the value of biodiversity is reflected in a relatively balanced manner between the objectives, but not between the targets. Targets 9 to 12 are dedicated to the use of biodiversity to respond to the needs of people, creating a strong "human-centred" bias. Heritage value is not reflected in the framework, although it may be the outcome of preserving biodiversity for other reasons (this partially concurs with the analysis of cultural services above).

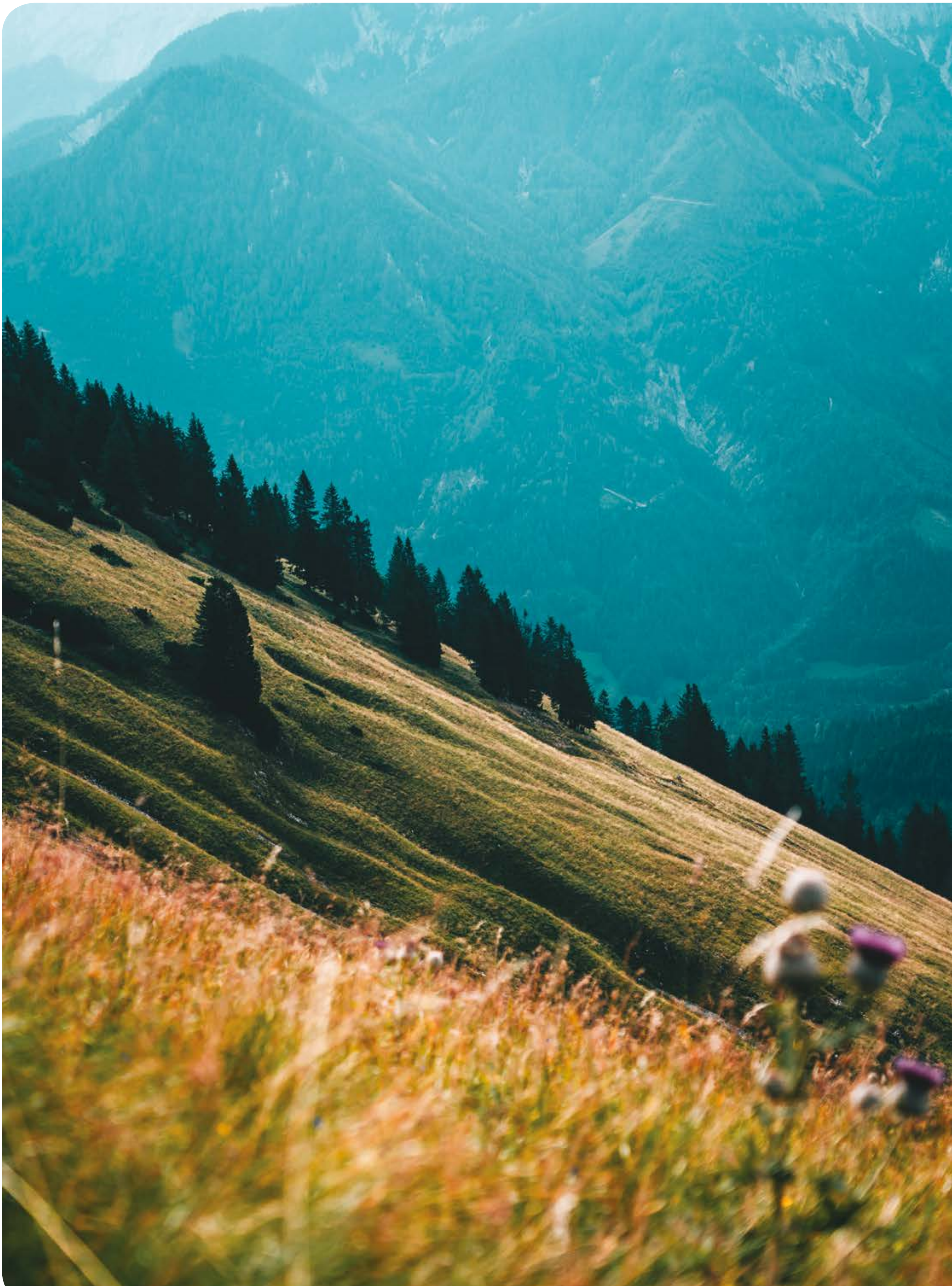
It should be noted that this classification exercise is a particularly delicate one: we have identified some aspects of the values that are not centred on human needs to illustrate that the intention is not to preserve biodiversity simply with a view to its use by humans. Some States involved in the negotiations could refer to diverse values of nature. Rewording of some objectives or targets on which there is no common view, to reflect other value systems, could make it possible to overcome some blocking points, as illustrated by the IPBES process for adopting reports.

However, the very fact that the human community has decided to act in favour of biodiversity through the CBD gives its actions an anthropocentric dimension, which is unavoidable. In addition to this, the result of an action to preserve biodiversity will have different values for the stakeholders involved: the non-usage of a wild plant that is preserved may have economic value for a business, which retains the right to use it for profit at a later date, or heritage value for local inhabitants. It also has non-anthropocentric value for the insects or animals which eat this plant or live in it.

It should be noted that target 20, which is related to the numerous views of what constitutes good living conditions (and therefore, indirectly, the diversified relationships between humans and non-humans) has disappeared from the version proposed for the *First Order Draft* (whereas the *zero draft* included it). Although this target is scarcely operational, it was, however, the only one which encouraged us to leave behind the current predominant view of the relationship between humans and nature, which is a utilitarian view. The IPBES global assessment published in 2019 states that "in most global change scenarios, biodiversity and nature's regulatory contributions to people should decline further during the forthcoming decades, whilst supply and demand of material contributions with an established market value (food for human and animal consumption and timber for lumber and bioenergy) should increase." In the same report, IPBES points out that "other models and measures in favour of economic health (such as inclusive accounting integrating wealth, natural capital and decline models) are increasingly considered as potential approaches for reconciling economic growth with conservation of nature and its contributions, and for identifying compromises, plurality of values and long-term objectives."

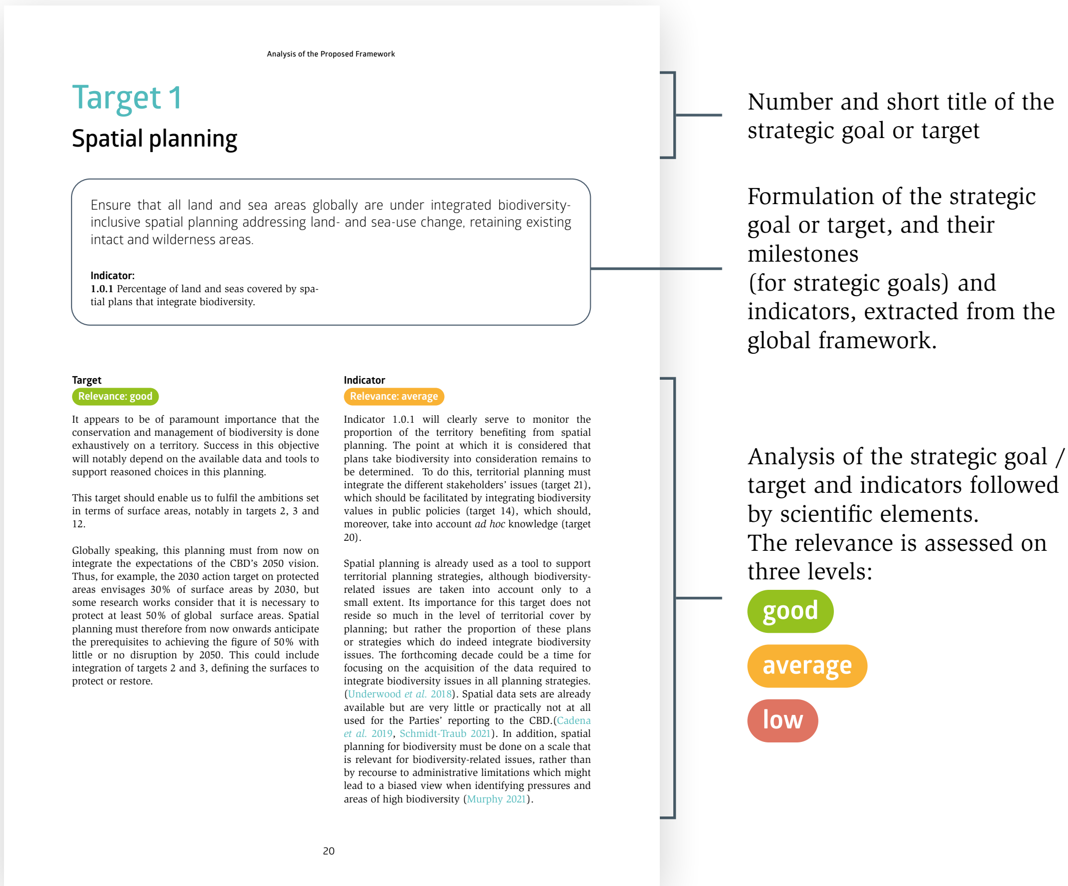
RECOMMENDATIONS

- As the pressure-related approach has not been chosen for the global framework, maintain vigilance to ensure that operational measures are taken on all direct and indirect pressures identified by IPBES.
- Study the possibility of wider sharing of the benefits of biodiversity beyond the simple genetic resource perspective and introduce sharing of the benefits drawn from biodiversity and ecosystem services.
- Put the concept of the multiple values of nature back into the framework, notably based on scenarios from the IPBES reports (where green economy scenarios fail to preserve biodiversity).
- Recall the intrinsic value of nature in the supporting text of the global framework in the decision of the Convention on Biological Diversity (CBD) regarding this point.



2. Point by point analysis and scientific aspects

Note for the reader:


Analysis of the Proposed Framework

Target 1

Spatial planning

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.

Indicator:
1.0.1 Percentage of land and seas covered by spatial plans that integrate biodiversity.

Target
Relevance: good

It appears to be of paramount importance that the conservation and management of biodiversity is done exhaustively on a territory. Success in this objective will notably depend on the available data and tools to support reasoned choices in this planning.

This target should enable us to fulfil the ambitions set in terms of surface areas, notably in targets 2, 3 and 12.

Globally speaking, this planning must from now on integrate the expectations of the CBD's 2050 vision. Thus, for example, the 2030 action target on protected areas envisages 30% of surface areas by 2030, but some research works consider that it is necessary to protect at least 50% of global surface areas. Spatial planning must therefore from now onwards anticipate the prerequisites to achieving the figure of 50% with little or no disruption by 2050. This could include integration of targets 2 and 3, defining the surfaces to protect or restore.

Indicator
Relevance: average

Indicator 1.0.1 will clearly serve to monitor the proportion of the territory benefiting from spatial planning. The point at which it is considered that plans take biodiversity into consideration remains to be determined. To do this, territorial planning must integrate the different stakeholders' issues (target 21), which should be facilitated by integrating biodiversity values in public policies (target 14), which should, moreover, take into account *ad hoc* knowledge (target 20).

Spatial planning is already used as a tool to support territorial planning strategies, although biodiversity-related issues are taken into account only to a small extent. Its importance for this target does not reside so much in the level of territorial cover by planning; but rather the proportion of these plans or strategies which do indeed integrate biodiversity issues. The forthcoming decade could be a time for focusing on the acquisition of the data required to integrate biodiversity issues in all planning strategies. (Underwood *et al.* 2018). Spatial data sets are already available but are very little or practically not at all used for the Parties' reporting to the CBD.(Cadena *et al.* 2019, Schmidt-Traub 2021). In addition, spatial planning for biodiversity must be done on a scale that is relevant for biodiversity-related issues, rather than by recourse to administrative limitations which might lead to a biased view when identifying pressures and areas of high biodiversity (Murphy 2021).

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A review of the scientific literature has been carried out to assess the relevance of the targets and their wording. Scientific work in the context of this analysis agrees, overall, that any strategy which does not include the need to preserve biodiversity is not sustainable. In addition to this, using the global framework to reduce ambitions which include recommendations based on research into efforts to conserve biodiversity (e.g., the 50% of protected areas) and changes to our lifestyle (ecological footprint within global limits) would be tantamount to rejecting the sustainability dimension and at the same time the achievement of sustainable development goals as a whole. (Blicharska *et al.* 2019, Obrecht *et al.* 2021). In the light of the need for urgent action in the face of the rapid degradation of biodiversity, the absence of an ambitious agreement on biodiversity (before 2030), including effective implementation, would lead to significant long-term biodiversity loss, often due to an excessively short-term view. The principle of inter-generational solidarity therefore makes it imperative to set up this type of agreement, since there is no alternative.

STRATEGIC GOAL A “Conservation” (Maintain and restore biodiversity and the ecosystems)	T1 Spatial planning
	T2 Restoration
	T3 Protected areas
	T4 Wild and domestic populations
	T5 Use of wild species
	T6 Invasive alien species
	T7 Pollution
	T8 Climate change
STRATEGIC GOAL B “Use” (Stop the decline in nature's contributions to people)	T9 Material services
	T10 Agriculture
	T11 Regulating services
	T12 Cities
STRATEGIC GOAL C “Equitable sharing” (Ensure fair and equitable access to natural resources)	T13 Access and fair and equitable benefit sharing
STRATEGIC GOAL D “Implementation” (Deploy sustainable tools and solutions)	T14 Political mainstreaming
	T15 Mainstreaming in businesses
	T16 Mainstreaming by citizen
	T17 Biotechnologies
	T18 Harmful subsidies
	T19 Resource mobilization
	T20 Knowledge
	T21 Equitable participation and human rights

TABLE 1 : SUMMARY ORGANIZATION OF THE FUTURE DRAFT POST-2020 GLOBAL FRAMEWORK FOR BIODIVERSITY WITH THE 4 MAIN STRATEGIC GOALS AND 21 RELATED TARGETS.

Table 1 presents the general organisation of the future global framework agreement into four main objectives leading up to 2050, with milestones for 2030. The first three objectives take up the three CBD objectives (conservation, sustainable use and benefit sharing), with the fourth being specifically dedicated to implementation of the framework. Action-orientated targets to be achieved by 2030 have been set for each of these four main objectives. For each objective and target, monitoring items with related indicator sets have been identified and proposed for negotiation.

Figure 1 below proposes an overall view of the links between targets, biodiversity loss drivers, the expectations of the future framework and CBD expectations. It should be noted that the different targets of the proposed global strategy framework for biodiversity are not all of the same order: targets 14 and 20 are "contributions" to be included in the global framework to implement targets which activate mechanisms (targets 1, 13, 15, 16, 18, 19 and 21). These mechanisms make it possible to address direct biodiversity loss drivers (targets 2, 3, 5, 6, 7, 8, 12 and 17) which, if they are stemmed, will open the way to reach targets addressing the state of biodiversity (target 4) and the supply of services to human populations (targets 4, 9, 10 and 11).

Moving from right to left in Figure 1, we may observe targets which clarify our aim as an "output" from this strategy, and which reflect the CBD Vision for 2050 of "living in harmony with nature". The latter could be achieved when biodiversity is conserved and human activity is sustainable, notably through maintaining ecosystem services. The vision will, therefore, become a reality when target 4, "Protection of the Species" is achieved, along with the targets through which humans benefit from biodiversity, namely targets 9, 10 and 11, (material, agricultural and regulatory services, respectively).

Prior to these "output" targets guaranteeing conservation and services, we must address the biodiversity loss drivers threatening the achievement of targets 4, 9, 10 and 11, identified by IPBES and expressed in targets 5 (overexploitation of the species), 6 (invasive alien species), 7 (pollution), 8 (climate change) and, lastly, 2, 3 and 12 (change of land use, through restoration, protected areas and sustainable cities, respectively), to which the framework adds target 17 (biotechnologies), which also create risks for biodiversity. The Cartagena Protocol addresses this latter point. In view of the response time between any variations in the levels of pressures on biodiversity and its state, it is possible that in Europe, for example, the effects of decreased pressure on biodiversity will only be visible in the more or less long term, which makes swift action on the pressures necessary from a long-term point of view.(Gosselin and Callois 2021). The general framework would also benefit from better consideration of indirect pressures such as the development, sometimes on a massive scale, of technologies with a destructive effect on biodiversity, consumer practices, regulations, governance methods, demography, etc.

The strategy for the future envisages mechanisms to reduce pressure drivers, such as integration of the various biodiversity-related aspects in the other issues, from the territorial spatial planning stage onwards (target 1). Integration of the different types of stakeholders involved will ensure that the diversity of the issues is taken into consideration (target 21). Moreover, the integration of the many values of biodiversity in business strategies (target 15) and by human populations (target 16), to reduce pressures on biodiversity, could be facilitated by support (notably funding, training and access to knowledge) for good practices (target 19); the drop in the amount of financial resources deployed will be in proportion to the reduction of the level of the current harmful subsidies (target 18). In addition to this, the third CBD objective, taken up here via target 13 on access and sharing benefits from the use of biodiversity, is to add a shared collective dimension to the use of genetic resources, in pursuit of the objective that the ABS principle should extend to all natural resources.

To activate these mechanisms, which aim to reduce pressures on biodiversity, leading, finally, to the conservation of biodiversity and sustainability of the services it provides for human populations, two "contributions" are in the hands of the States that will negotiate the future global strategy at the COP 15 conference: firstly, relevant knowledge of all sorts to foster clear, evidence-based decision-making (target 20), and secondly the political will to implement this strategy (target 14). Figure 1 illustrates the organisation structure and the links between the different targets.

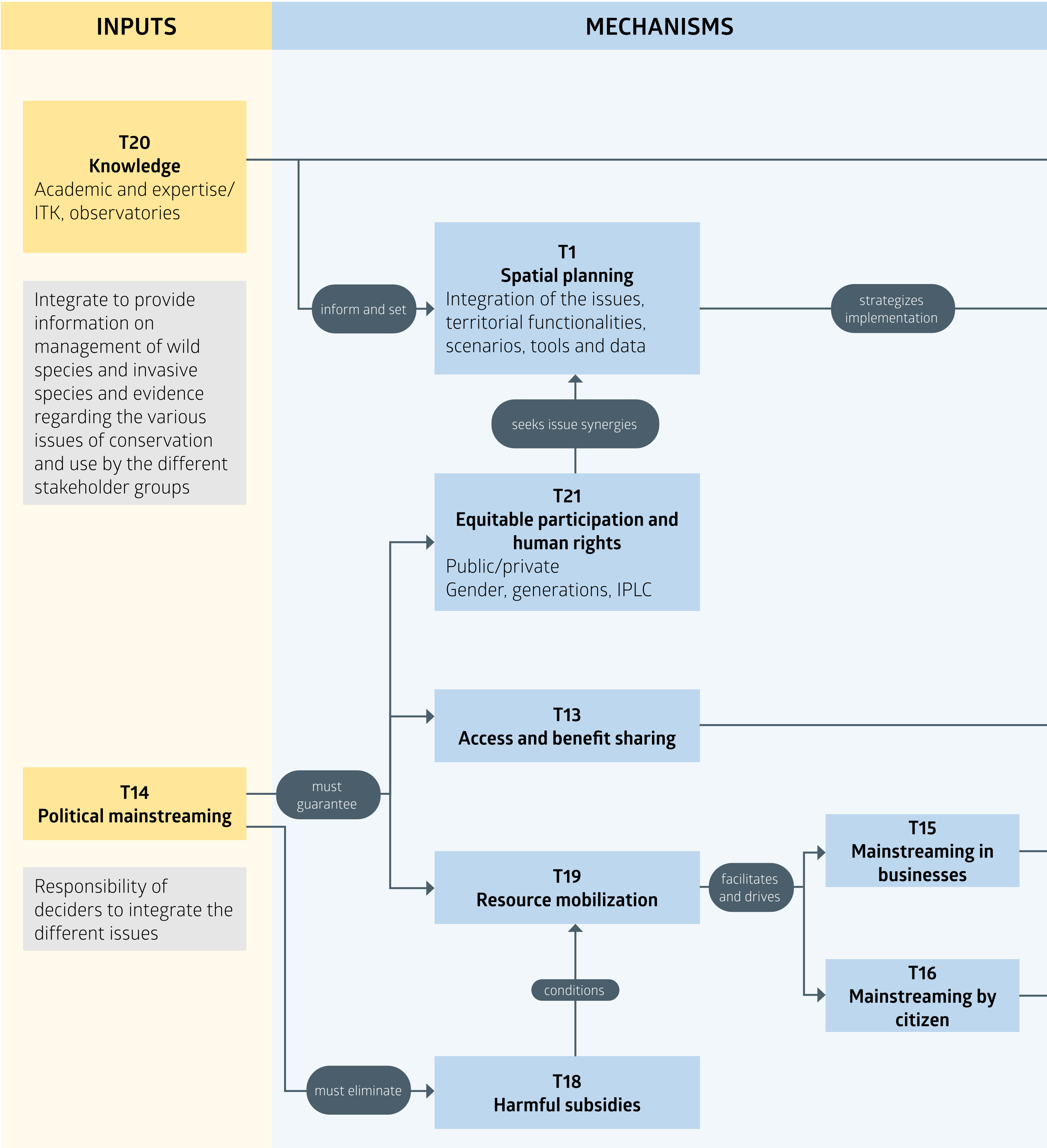
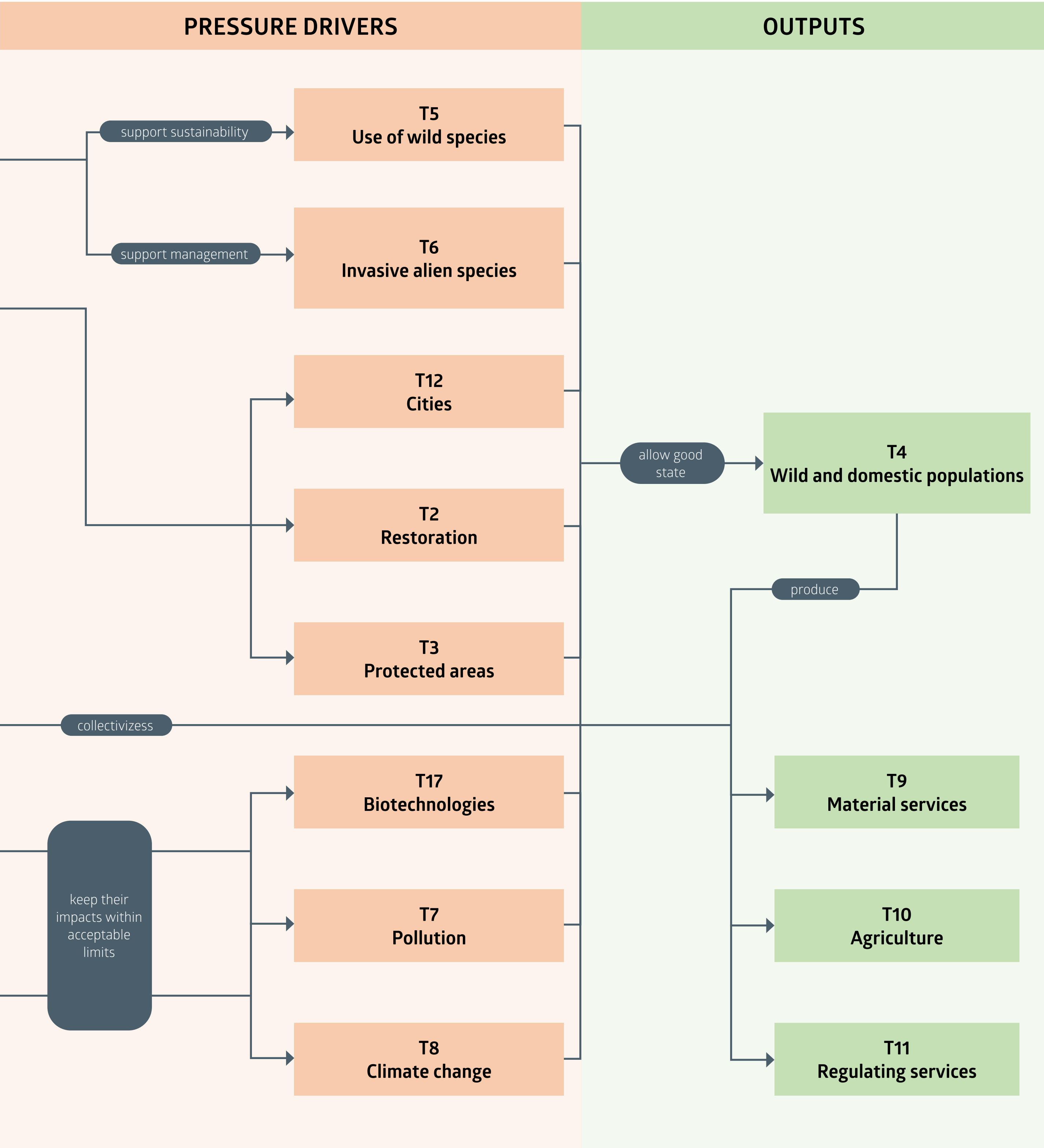
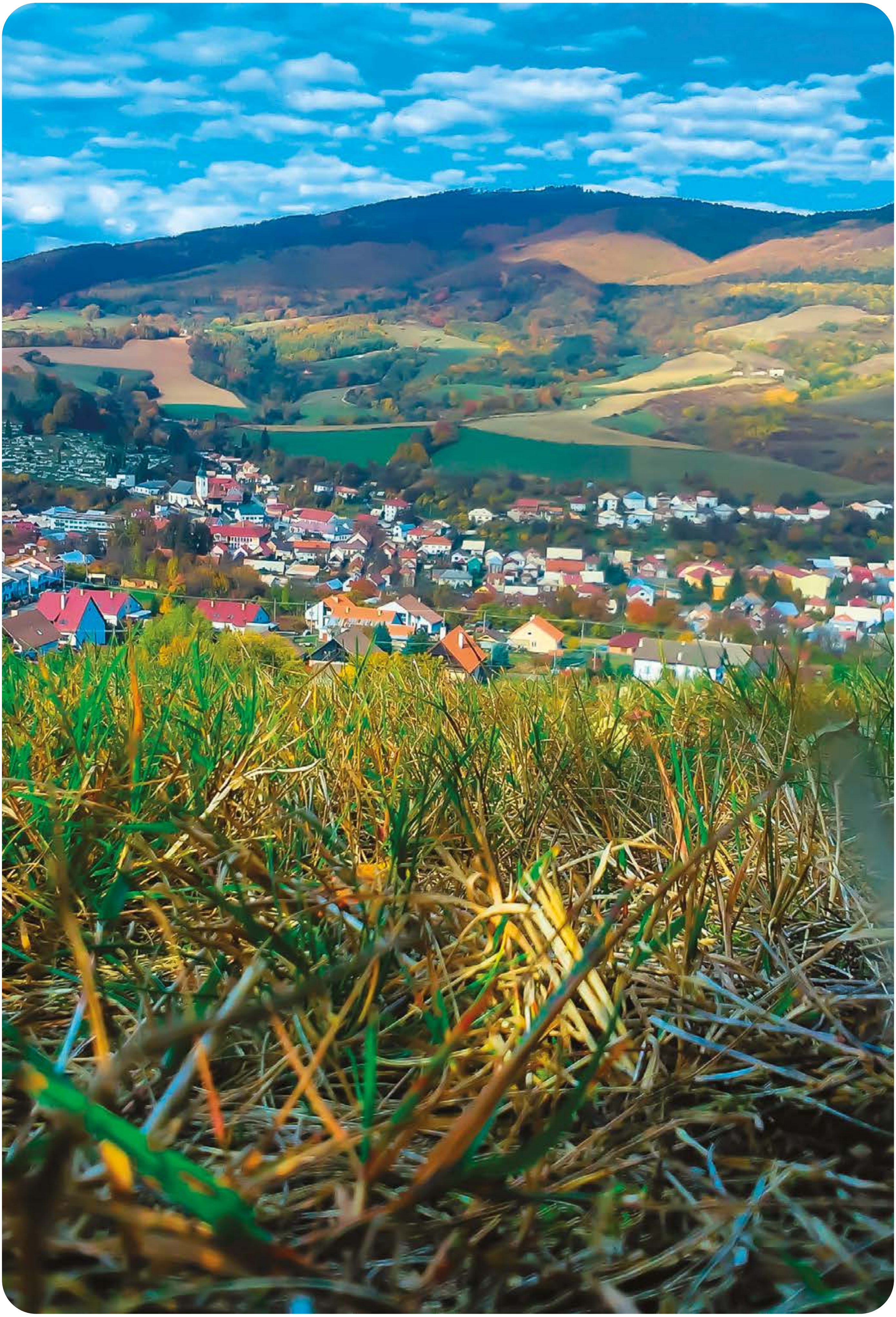


FIGURE 1 : ORGANIZATION OF THE 21 POST-2020 GLOBAL FRAMEWORK FOR BIODIVERSITY TARGETS. THE LINKS BETWEEN THE TARGETS ARE NOT EXHAUSTIVE AND OTHERS MIGHT BE IDENTIFIED, SUCH AS SPATIAL PLANNING FOR THE USE OF WILDLIFE (TARGETS 1 AND 5), OR ABS ASPECTS VIS-À-VIS FUNDING OF THIS STRATEGY (TARGETS 13 AND 19).


PRESSURE DRIVERS
OUTPUTS
support sustainability
T5
Use of wild species
support management
T6
Invasive alien species
T12
Cities
allow good state
T4
Wild and domestic populations
T2
Restoration
produce
T3
Protected areas
collectivizess
T17
Biotechnologies
T9
Material services
keep their impacts within acceptable limits
T7
Pollution
T10
Agriculture
T8
Climate change
T11
Regulating services



Strategic Goal A

Conservation - Maintain and restore biodiversity and the ecosystems

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.

Milestone A.1
Net gain in the area, connectivity and integrity of natural systems of at least 5 per cent.

Milestone A.2
The increase in the extinction rate is halted or reversed, and the extinction risk is reduced by at least 10 per cent, with a decrease in the proportion of species that are threatened, and the abundance and distribution of populations of species is enhanced or at least maintained.

Milestone A.3
Genetic diversity of wild and domesticated species is safeguarded, with an increase in the proportion of species that have at least 90 per cent of their genetic diversity maintained.

Indicators:
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.0.2 Species Habitat Index.
A.0.3 Red list index.
A.0.4 The proportion of populations within species with a genetically effective population size > 500.

Objective

Relevance: average

Questions remain on the assessment of ecosystem integrity and the species' extinction rates.

In addition to this, the genetic diversity objective for 2050 is practically the same as the 2030 milestone. The milestone aims to increase the number of populations whose genetic diversity is preserved by at least 90% and then to succeed in maintaining them between 2030 and 2050. In the light of this 2030 milestone, it would be appropriate to set a more ambitious target for 2050, notably for species threatened with extinction through genetic erosion because their numbers or diversity are insufficient. For these species, our approach will no longer be to maintain but to restore this diversity. It is therefore appropriate to add a phrase at the end of the objective "Genetic diversity of wild and domesticated species is safeguarded, with an increase in the proportion of species that have at least 90 per cent of their genetic diversity maintained", as follows: "<u>restoring, if possible, that of species whose numbers are insufficient</u>".

Indicators

Relevance: average

Additional indicators are required to assess ecological integrity and connectivity. Indicators related to the structure, functions or composition of the ecosystems may be proposed[3]. Other research suggests that an objective at ecosystem level must include three components: surface, integrity and the risk of collapse. In this approach, ecological integrity is defined as the degree to which a given ecosystem's composition, structure and function characteristics are maintained and supported.

Several recent scientific works underline the necessity of protecting a significant proportion (50%) of the planet's surface area (including the oceans) by limiting intensive human activities, if we wish to preserve biodiversity and at the same time to maintain the contributions that humans draw from the functioning of the ecosystems. (Noss *et al.* 2012, Cazalis *et al.* 2018, Dinerstein *et al.* 2020, O'Leary *et al.* 2016, Allan *et al.* 2018, Woodley *et al.* 2019, Hannah *et al.* 2020, Sala *et al.* 2021).

With regard to land, 15.1% of the surfaces are already protected. To reach 50%, and thus preserve biodiversity, Dinerstein *et al.* (2020) consider that the extension of protected areas mainly concerns spaces that are still intact (16 %). Amongst the latter and in compliance with the results of the global assessment of biodiversity (IPBES, 2019), recognition that land management methods used by indigenous peoples and local communities (IPLC) who live there already favours protection of biodiversity might lead to their inclusion in the 15.1% already protected and could make it possible to reach 30%, in other words the milestone envisaged for 2030 (Strassburg *et al.* 2020). To reach the required 50%, it will therefore be necessary to add the restoration of 15% of the surface areas, with particular attention being paid to the connectivity of intact surfaces, which results in other joint benefits in terms of ecosystem services(Strassburg *et al.* 2020).

With regard to sea areas, the surface area currently protected varies between 2.18% and 8%, depending on the extent to which the different protection practices have been integrated (O'Leary et al. 2016, Visconti et al. 2019). Globally speaking, the research concludes that several dozen percent of the world's ocean surface area need to be protected to mutualize several objectives (notably conservation and exploitation). Gownaris et al. (2019) have created an inventory of works which identify 14% of the oceans

3. https://connectscape.github.io/Makurhini/index.html

as having major biodiversity issues and 88 % of these as unprotected. With regard to waters beyond national jurisdictions, 23 % of their surface areas would protect 30 % of the most significant biodiversity (Visalli et al. 2020).

Assessment of ecosystem integrity and connectivity is not expressed in the monitoring items or indicators envisaged. Indicator A.0.1 essentially addresses types of land use, without assessing their ecological quality. Indicator A.0.3 measures the proportion of habitats remaining intact compared with a baseline year; it seems to integrate the fragmentation of these habitats, and its compilation of the different species within the same ecosystem could serve to monitor the ecological integrity of this ecosystem (c.f. BIP Factsheet). Research on the level of connectivity of protected areas, showing that currently only half of the protected areas are actually connected, could provide additional elements to support this connectivity estimation (Saura *et al.* 2018), including *via* the "ProtConn" indicator ("*Protected Connected Indicator*"; Saura et al. 2017), although this is not an indicator of ecological functionality, but rather the connectivity of (protected, non-protected or cross-boundary) land surfaces within which movement is possible. Hansen *et al.* (2021) propose a selection of 13 indicators for monitoring ecological integrity, based on their relevance with regard to ecosystem characteristics (structure, function or composition), their aggregation/disaggregation at different levels, scientific validity and availability. Nicholson et al. (2021) suggest that an objective at ecosystem level must include three components: surface area, integrity and the risk of collapse; and that this could only be correctly monitored by a set of indicators. The risk of collapse is two-dimensional, involving a diminished surface area and loss of integrity. Thus, decreasing the risk of collapse could be mentioned as a Strategic Goal A issue and the "surface area" and "integrity" elements could be taken up in the targets related to this objective, notably targets 2 and 3, which address ecosystem protection and restoration. The Theory of Change applied to this objective at ecosystem level presented in Nicholson *et al.* (2021) shows the link between the risk of ecosystem collapse and the drivers influencing it. This approach would thus help to strengthen the consistency of a global strategy for biodiversity by providing a link between the different targets for action in the framework (pollution, invasive alien species, exploitation of species, climate change, nature-based solutions, etc.).

This objective's genetic dimension, monitoring items and related indicators should strengthen preservation. This aspect of biodiversity does seem lacking, generally speaking, in protected area projects (Laikre *et al.* 2016). Research indicates average theoretical minimum thresholds of 50 breeding individuals in a population to avoid inbreeding depression, which would lead to the short-term loss of this population. This figure increases to a minimum of 500 breeding individuals to avoid the risk of genetic drift, thereby preserving the potential long term development of this population (Jamieson et Allendorf, 2012). In terms of action targets, the proposal by Hoban *et al.* (2020) takes up the items of this reworded objective, covering wildlife but also collections of biological resources, and proposes the following monitoring indicators:

a. For a given species, the proportion of populations with an effective size of more than 500 individuals, compared with those that have less than 500 individuals;

b. The proportion of (sub)populations maintained within the species;

c. The number of species and populations within which genetic diversity is monitored by DNA-based methods;

d. The number of species and populations for which phenotypic descriptions are available.

The research concludes that on average, 10 % of individuals in a population are involved in the production of the next generation. Thus, if it is difficult to estimate the number of breeding individuals in a population (where a proportion of individuals is excluded from reproduction for different reasons: lack of maturity, reproductive competition, etc.) the minimum number of individuals to maintain in a population may be established at 5000 on average. These indicators provide guidelines for management and conservation strategies and are approximate alert levels (to be adjusted if possible, depending on the species), to identify overexploitation of a species. Indicators b and c complement indicator a.

Other proposals have emerged from research to identify a "flagship" biodiversity conservation objective that it is easy to communicate, along the lines of "1.5 °C for the Climate."

a. Rounsevell *et al.* (2020) propose an indicator to monitor the number of extinctions with a human origin, with the aim of keeping them at less than

20 extinctions per year, taking into consideration major groups (fungi, plants, invertebrates and vertebrates) and all ecosystem types (sea, fresh water and land) for the next 100 years. This raises the question of how to interpret this indicator, as it is possible to observe a strong loss of biodiversity without extinction of the species. Conversely, a rate of extinction higher than normal inevitably leads to a loss of biodiversity. In addition, this indicator only applies to the species described; given that most of the species are unknown, it seems that it would be difficult for the indicator to reflect reality. This type of indicator should be interpreted as follows: "If the indicator shows an increase in the rate of extinction of over 20 species annually, this is evidence that the situation gives cause for concern (among known species) and that action must be taken; if the indicator shows a decrease in this rate of extinction of less than 20 species annually, this does not necessarily mean, however, that the situation is showing a positive trend". This indicator would serve mainly as a warning signal, similar to the effect of the announcement by IPBES after its 2019 assessment that a million species were under threat.

b. Soto-Navarro *et al.* (2021) propose the use of a multidimensional biodiversity indicator (the state, abundance and functions of diversity; nature's contributions to people), which could provide further evidence on which to base decision-making. It is based on the fact that decision-makers are influenced by different narratives on the importance of biodiversity, making it difficult to establish a link between biodiversity loss and the achievement of sustainable development goals. This indicator is intended to be a biodiversity-related equivalent of the UN human development index. The aim is to provide a scientific reference framework to measure the "health" of ecosystems and facilitate comparisons between countries regarding the fight against biodiversity loss. Thus, for the "global" or baseline (national) indicator, it is important to use world data sets to provide a consistent image worldwide, so that the differences in indicator scores between the Parties (countries) may be attributed to differences in biodiversity health rather than data variations.

c. Another approach is known as the "Nature Positive" approach, which suggests 3 common targets for all multilateral environmental agreements (Locke *et al.* 2020): i) no additional biodiversity loss, with the possibility of restoration to establish at least a neutral balance, from 2020; ii) a positive balance in 2030; iii) complete recovery in 2050. The value of this proposal is that it reminds us that this strategy looks beyond 2030, which is very much lacking in the current version of the global framework project.

Targets 1 to 8, below, cover the actions to be taken to respond to Strategic Goal A of the framework, grouped together under the banner of "Reducing Threats".

Target 1

Spatial planning

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.

Indicator:
1.0.1 Percentage of land and seas covered by spatial plans that integrate biodiversity.

Target

Relevance: good

It appears to be of paramount importance that the conservation and management of biodiversity is done exhaustively on a territory. Success in this objective will notably depend on the available data and tools to support reasoned choices in this planning.

This target should enable us to fulfil the ambitions set in terms of surface areas, notably in targets 2, 3 and 12.

Globally speaking, this planning must from now on integrate the expectations of the CBD's 2050 vision. Thus, for example, the 2030 action target on protected areas envisages 30% of surface areas by 2030, but some research works consider that it is necessary to protect at least 50% of global surface areas. Spatial planning must therefore from now onwards anticipate the prerequisites to achieving the figure of 50% with little or no disruption by 2050. This could include integration of targets 2 and 3, defining the surfaces to protect or restore.

Indicator

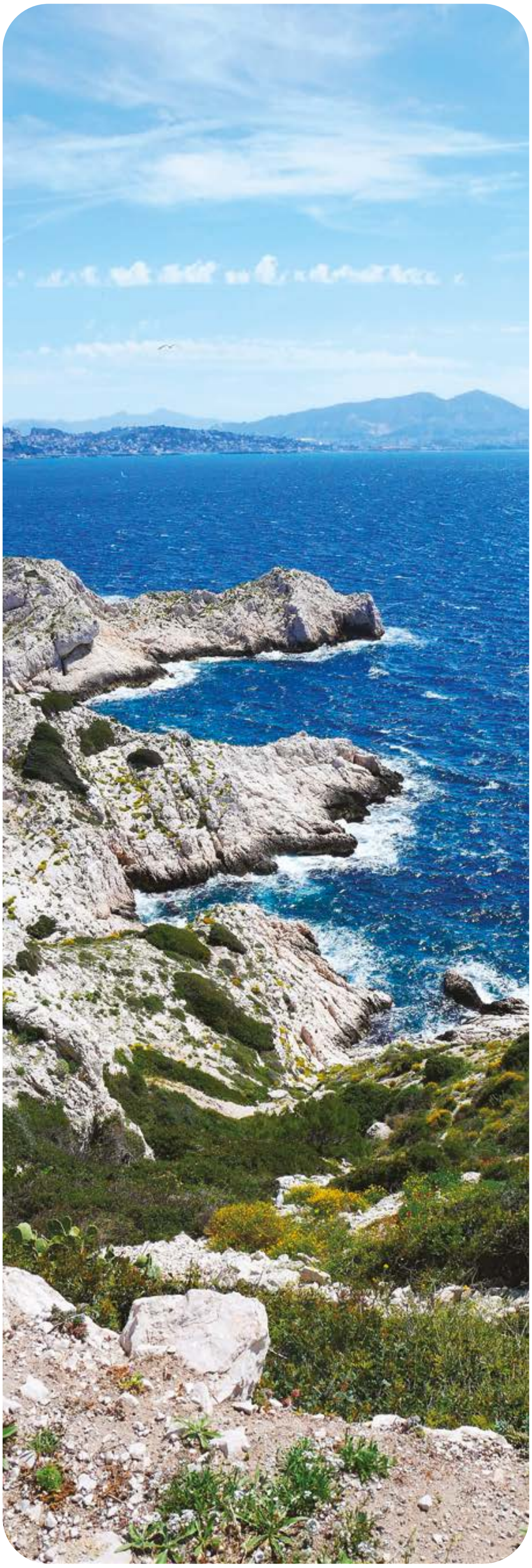
Relevance: average

Indicator 1.0.1 will clearly serve to monitor the proportion of the territory benefiting from spatial planning. The point at which it is considered that plans take biodiversity into consideration remains to be determined. To do this, territorial planning must integrate the different stakeholders' issues (target 21), which should be facilitated by integrating biodiversity values in public policies (target 14), which should, moreover, take into account *ad hoc* knowledge (target 20).

Spatial planning is already used as a tool to support territorial planning strategies, although biodiversity-related issues are taken into account only to a small extent. Its importance for this target does not reside so much in the level of territorial cover by planning; but rather the proportion of these plans or strategies which do indeed integrate biodiversity issues. The forthcoming decade could be a time for focusing on the acquisition of the data required to integrate biodiversity issues in all planning strategies. (Underwood *et al.* 2018). Spatial data sets are already available but are very little or practically not at all used for the Parties' reporting to the CBD.(Cadena *et al.* 2019, Schmidt-Traub 2021). In addition, spatial planning for biodiversity must be done on a scale that is relevant for biodiversity-related issues, rather than by recourse to administrative limitations which might lead to a biased view when identifying pressures and areas of high biodiversity (Murphy 2021).

Most protected areas in the world lack spatial coverage (ecoregions, threatened species, key zones, etc. (see Maxwell *et al.* 2020), but also connectivity (Saura *et al.* 2018, Ward *et al.* 2020). Most of the zones targeted with regard to protected area connectivity are not protected (Brennan *et al.* 2021): this must therefore be integrated into future spatial planning of protected areas (Asaad *et al.* 2018).

Similarly, to integrate the different biodiversity conservation and sustainable usage issues of these aspects, incorporation of ecosystem services in the planning process will provide a more comprehensive view of territorial development potential and trajectories. This integration will facilitate the setting up of more sustainable territorial management strategies (Kukkala 2017, Villareal-Rosas *et al.* 2020) and identification of priority conservation zones (Hlásny *et al.* 2021, Shiono *et al.* 2021) (link with targets 2 and 3). It will identify the best compromises or synergies between biodiversity conservation and agricultural production, in particular(Zabel *et al.* 2019) (link with targets 9 to 12) and will contribute to the fight against resistance to the extension of protected areas (Lindenmayer *et al.* 2018).



Target 2

Restoration

Ensure that at least 20 per cent of degraded freshwater, marine and terrestrial ecosystems are under restoration, ensuring connectivity among them and focusing on priority ecosystems.

Indicator:
2.0.1 Percentage of degraded or converted ecosystems that are under restoration.

Target

Relevance: average

Ecosystem restoration is a priority. Scientific reports agree that a minimum of around 50% of the world must be protected. Since 75% of total surface areas are already degraded to differing degrees, their restoration is necessary.

More information is required, with more accurate details of the location and proportion of the surface areas to be restored. This proportion must also be set against the other surface-related objectives, especially those pertaining to protected areas, to determine which areas are already integrated and in what proportions. Clarification is required on the calculations proposed in this draft: is the issue the restoration of 20% of global surfaces or 20% of the 75% of surfaces already degraded (i.e. 0.2 x 75 = 15% of global surfaces)?

In addition, it is necessary to avoid a situation where the principle of restoration becomes an argument to justify degradation of ecosystems still in a good state, clarifying that what is required here is to "reverse the loss" of the ecosystems, rather than "increasing the surface area", which could involve further degradation, in spite of positively balanced figures (surface or integrity). This target addresses surfaces that are currently in a degraded state and cannot address compensation mechanisms i.e. future degradations.

Indicator

Relevance: good

The proposed indicator seems to provide accurate monitoring of the target's development. However, the ecosystems involved and their level of degradation must be correctly defined. It is also necessary to determine how the aspects of connectivity and ecosystem prioritization are monitored. One disadvantage of this indicator is that it does not qualify this restoration, since some environments are more degraded than others, with variable benefits, depending on the situation.

In 2019 IPBES reported that 75% of land surfaces were degraded to differing degrees by human activities. (IPBES, 2019). A consensus exists between recent studies on a minimum figure of 50% of surfaces to be protected (Dinerstein *et al.* 2020, Sala *et al.* 2021, etc.), which implies a de facto need to restore ecosystems that are already degraded.

Further research is necessary in order to provide scientifically proven figures as to the proportion of the surfaces or the integrity level of the ecosystems to be restored. In particular, it is necessary to define the quantities and types of restoration activities required to reduce ecosystem collapse, depending on their different levels of degradation. (Nicholson *et al.* 2021). Recent land studies have located 15% of the surfaces to be restored, which would contribute to the reduction of expected extinctions by 60% and the sequestration of 30% of the total C02 increase in the atmosphere since the industrial revolution. (Strassburg *et al.* 2020). In addition, it must be established that there is a strong link between the maintenance or recovery of 20% of native natural areas in the managed landscapes (Garibaldi *et al.* 2020), particularly when this is agricultural land, beneficial for biodiversity, the climate and ecosystem services, and restoration, both qualitatively and quantitatively.

In conjunction with the other targeted actions on surface areas and ecosystem preservation, we should ensure that the framework prevents further degradations on the pretext of positive balances (in terms of surfaces or integrity). It is indeed the case that biodiversity loss in degraded ecosystems requires long term action, since restoration takes a lot of time and effort, with sometimes uncertain results (Nicholson *et al.* 2021, Brudvig *et al.* 2021). Exploitation or management practices causing degradation of ecosystems still apparently in a good state therefore seems to be an unwise strategy leading in the short term to loss of ecosystem services, negative externalities and, in the medium term, to the need to restore ecosystems at costs often higher than the benefits generated by the exploitation or use in question. This is also in opposition to the objective of protecting 50% of the surfaces by 2050. "No net losses" is not the same as "no losses". Since compensation is not instantaneous, the delay in obtaining compensation for human-induced impacts reduces the ecological resilience of the ecosystems and will lead to continued biodiversity loss.(Buschke and Brownlie, 2020).

It is also important to have a correct definition of the concept of restoration to avoid bogus solutions that could be harmful to conservation of biodiversity. Afforestation [4], as it is envisaged as part of the fight against climate change (to be distinguished from reforestation), for example, should not be considered as restoration, because it does not consist in returning to a state that existed before human-related degradation. Neither should it be considered a nature-based solution (Dooley *et al.* 2020, Seddon *et al.* 2021), because of its inherent risks for biodiversity: the introduction of invasive alien species, pollution during storage, competition for the land with environments that are more conducive to biodiversity, and loss of functionalities for these ecosystems (Pawson *et al.* 2013, Kull *et al.* 2019, Diaz *et al.* 2019, Dooley *et al.* 2020), and threats to water resources (Xiao *et al.* 2020). As a result, it should be excluded from post-2020 framework implementation options. This is also the case for bioenergy operating procedures, with processes for capturing and storing C02 that are supposed to compensate for negative impacts, only considered here from the angle of greenhouse gas emissions[5] (Dooley *et al.* 2020, Seddon *et al.* 2021). Beyond the risks for biodiversity and uncertainties on the real potential to curb climate change provided by this type of solution (Baldocchi et Penuelas 2018, Taylor & Marconi 2019, Fagan *et al.* 2020, Jiang *et al.* 2020), one adverse effect could be to relegate the need to reduce emissions and challenge production methods and consumer practices to the rank of secondary issues (see targets 15 and 16).

Dinerstein *et al.* (2020) propose a "global safety net" which shows that, beyond the 15.1% of land currently protected, conservation of an additional 35.3% of land would be necessary to conserve sites of particular importance for biodiversity and stabilize the climate. The authors have published a digital map to accompany the global safety net. It can be analysed by country, ecoregion and indigenous territory. These studies support the objectives of protection of indigenous land and explicitly target protection of property rights and the traditional management practices of communities subject to the severest threats of food insecurity, the adverse effects of land degradation and climate change.

4. Afforestation is the act of planting trees with the aim of establishing a wooded area on a surface that has remained treeless for a long time or in some cases has never (according to human timescales) belonged to a forested area. It is different from reforestation in that the latter consists in replanting wooded areas by humans on a surface that they have deforested.
5. BECCS = *BioEnergy with Carbon Capture and Storage* using an energy extraction process based on biomass and carbon capture and storage, notably in geological strata.

Target 3

Protected areas

Ensure that at least 30 per cent 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 areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Indicator:
3.0.1 Coverage of Protected areas and OECMS (by effectiveness).

Target

Relevance: average

This target capitalizes on the encouraging results of the Aichi target with regard to protected areas, but care should be taken to ensure that it is not viewed as the ultimate goal, whereas in fact it is clearly a minimum, and above all, an intermediate target. It would be useful to propose the following addition: "[…] at least 30% and, in the long term; 50% of the planet" or at least indicate that this is an intermediate target pointing towards a more ambitious objective that is indispensable for the medium- or long-term survival of humanity.

Indicator

Relevance: good

The inclusion of the "effectiveness" criterion in indicator 3.0.1 is a significant development, enabling us to go further than monitoring only the surface dimension of the protected areas.

This target is the operational application of Strategic Goal A in terms of protected areas. This 30% could be made up of both the intact areas and restored areas, in proportions that could be defined by every Party to CBD on the basis of their ecological context. The draft framework may seem less ambitious than the scientific community recommended, mentioning the figure of 50% at world level. The draft framework designates this amount of 30% of protected areas as a "milestone" for 2030, which implies that this is merely an intermediate percentage, but the final figure is not mentioned. There is, moreover, a risk that, although the target refers to "at least" 30%, this percentage may be taken as an end in itself, whereas it is actually a minimum that must be exceeded. It should be recalled and written into this draft framework that 50% is a minimum to be reached in the long term. The studies note that the countries should use global biodiversity results to guide decisions regarding conservation by zone, rather than identical percentages between countries, since the non-uniform and cross-border aspects of biodiversity make it necessary to recognize transnational complementarity in the context of governance and actions. (Jetz *et al.* 2021).

The target does not really develop the concept of "contribution to people" mentioned in the target heading. Recent studies show that win-win strategies may be established between the protection and well-being of nature and respect of the territorial rights of human societies. Sala *et al.* (2021), for example, show how a network of well-designed protected sea areas amounting to 30% of the surface would provide benefits in respect of both biodiversity conservation and the fight against climate change, and exploitation of fishing resources. With regard to land, studies show that protection of 30 - 50% of surfaces would conserve from 60.7 to 85.3% of carbon stocks and 66 to 89.8% of clean fresh water, whilst covering 57.9 to 79% of the species to be conserved (Jung *et al.* 2021). In addition, analysis of the proposed 30% of protected areas shows that it is interesting to implement from a financial point of view. It is considered that they would supply 170 to 534 billion American dollars' worth of ecosystem services per year by 2050 (Waldron *et al.* 2020). Any conversion or ecosystem degradation cost would be borne by the societies.

The question of indigenous peoples and local communities remains crucial for this target, since conflicts between the latter and the protected areas could block the negotiations. We might recall that the protected area system may be an opportunity to strengthen the territorial rights of these peoples and communities. The studies show that sustainable traditional practices, knowledge and representations are a rampart against more destructive activities. The territories where these practices exist may be integrated in the 30% of the target regarding protected areas ("other, effective, equitable conservation measures") (Dinerstein *et al.* 2020). This protection would strengthen peoples' rights to the territories. Traditional practices, like all practices, may not, however, escape the assessment of their sustainability and are not, in any case, subject to any label guaranteeing this sustainability. Traditional knowledge and the forms of value attributed to biodiversity are crucial to understanding the sustainability of these practices and establishing adequate protection systems in these regions, linked to the legal systems and forms of governance of the human societies living there (Dawson *et al.* 2021) and the available scientific knowledge.

The importance of maintaining the reference to areas that are particularly important for biodiversity is reflected in the detail of the indicators proposed for monitoring this target, which could even be specified here: 30% of protected areas, including 100% key zones for biodiversity, ensuring that each type of ecosystem is properly represented.(Chauvenet *et al.* 2020). According to the simulation work done by Dinerstein *et al.* (2020), this is realistic: 15% of land areas are protected. If we add on 14.6%, we could protect the habitats of rare species, the main species groupings and the areas where the largest mammals are distributed. We might add on 16% of the most intact ecosystems, with an objective of 50% by 2050. In addition, the establishment of these protected areas must be based on ecological criteria. A situation where they are established only for "charismatic" or well-known species must be avoided, since this would diminish efficiency from an ecological point of view, with defects in completeness, specifics and extrinsic representativeness.(Delso *et al.* 2021).

Secondary indicators have been established for sea areas, to monitor trends at different levels in the protected areas, through their numbers, total surface areas, size categories, levels of protection, levels of ecological representativeness, management efficiency, level of connectivity and the level of pressure on the marine environment(Roberts *et al.* 2018). The Sala et *al.* (2021) team demonstrates that properly targeted protection of 30% of the oceans could contribute to improved marine food resource supplies, provide a natural, inexpensive solution in the fight against climate change and, finally, give more protection against threats to biodiversity.

The "effectiveness" dimension of territorial biodiversity protection measures is fundamental (Geldmann *et al.* 2021, Wolf *et al.* 2021). Indeed, the simple declaration that an area is now protected is not enough, because it must be followed by action. Thus, some protected areas do not assume their role, since no particular action for biodiversity has been set up since their establishment. They may be aptly described as "paper parks" because insufficient resources have been dedicated to implementation, (Coad *et al.* 2019), the designated areas are not of much interest in conservation terms (see remarks above), or because their protected status has been cancelled or downgraded (Golden Kroner *et al.* 2019). A recent report even mentions that 96% of European marine areas allow destructive activities inside their boundaries (Perry *et al.* 2020). Other authors underline the effective dimension of the protection to avoid the "paper parks" phenomenon (Visconti *et al.* 2020, Maxwell *et al.* 2020). New wording is therefore proposed and could be adopted in this target: "The value of all sites that are important for biodiversity, including key biodiversity areas, is documented, conserved and restored by protective areas and other effective protective territorial measures". The concept of biodiversity value here includes the aspects (populations, ecosystems and ecological processes) for which an area has been identified as a site of global importance for biodiversity. Lee and Abdullah (2019) propose a strategic framework to assess the efficiency of the conservation effort in the protected areas by integrating the interactions between the different drivers of protected area inefficiency and an efficiency indicator integrating the development, management and ecological integrity of these protected areas. The aspects concerning protected area efficiency should be structured to include risk assessment of the collapse of the ecosystems mentioned in Strategic Goal A. In this target 3, the proposed monitoring item 3.0.1 could include the dimensions of both the surfaces and the integrity of the ecosystems placed under protection. Aggregation of these two indicators is a basis for estimating the risk of collapse of the ecosystems involved (see Nicholson *et al.* 2021).

There was a reference to 10% of the world's surface designated as protected areas with a high degree of protection in the *Zero Order Draft*, but it has disappeared from the current version. We consider it important to maintain the idea of 10% under strict protection for land and sea areas (categories Ia, Ib, II of IUCN protected area categories). The benefit, in terms of biodiversity, of keeping areas untouched by any human activity is to have spaces where biodiversity is free(r) to evolve and to provide an opportunity to create areas where wildlife may be reconstituted and recolonize depopulated environments. The removal of the concept of strict protection from the target supports the idea of spatial planning for 100% of the areas (see target 1). In this sense, joint consideration of the often-opposing strategies of *land-sparing* vs *land-sharing* would allow an approach integrating both biodiversity conservation and human activities. In some cases, strict protection is the only solution for avoiding irreversible degradations. Certain practices, even traditional ones, may therefore mean that human activities are totally banished from some sites. In other cases, suitable protection measures and authorization of some human activities may be set up, as long as conservation interests are protected ("other effective area-based conservation measures"). This network of protection to varying degrees of strictness must in the long term allow biodiversity to be preserved on 50% of land surfaces and 30% of marine surfaces, as indicated in point 1 of this target. By default, if reincorporation of the quantification of strict protection in the global strategy is problematic, it is still possible, even advisable, to integrate the principle of this type of strict protection in the next strategic framework, even if it is not quantified, indicating, however, that when the survival of the population of a species or the maintenance of the ecological quality of some areas are impossible, human activities may be excluded from these zones for a period to allow reconstitution of biodiversity. This therefore requires flexible, adjustable management in the protected zones.

The protected surfaces concerned by this target must also be harmonized with the surfaces envisaged by spatial planning (target 1), those that are necessary for the reestablishment and conservation of species (target 4), those that may have a role in the control of invasive alien species (target 6), and those that are necessary for the supply of ecosystem services (targets 9 to 12).

Target 4

Wild and domestic populations

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.

Indicators:

4.0.1 Proportion of species populations that are affected by human wildlife conflict.

4.0.2 Number of plant genetic resources for food and agriculture secured in medium or long-term conservation facilities.

Target

Relevance: average

This target completes the qualitative dimension of target 3, focusing specifically on this dimension, and is applicable to all the territories, inside and outside protected areas. This is positive, since the qualitative dimension has been somewhat missing from progress monitoring of the Aichi 11 objective.

Moreover, the message communicated here represents a risk of limiting efforts to *ex situ* conservation, because it is easier, quicker and simpler to control in some cases (seeds, for example). Conservation in situ is an essential complement to conservation *ex situ*. Both must therefore be supported, and neither must be given priority.

Indicators

Relevance: low

Ex situ conservation of resources must be extended to taxa and areas other than agriculture (animals, forests, micro-organisms, etc).

Indicator 4.0.2 could be of interest for the assessment of its complementarity with *in situ* conservation if a second indicator could be considered upstream, applicable to "the number of plant-breeding resources for agriculture, secured through their use or dynamic *in situ* conservation".

The global conflict between humans and wildlife may be illustrated in the distribution of biomass from different groups of animals and their evolution (see target 16), with a link to targets 5 and 9 relating to harvesting individuals in wild environments. To reduce these conflicts and the risk to wildlife, mitigation of threats and restoration of habitats are two parameters that it is possible to juggle with, to limit the risk of species becoming extinct, assessed via the STAR indicator. (see Mair *et al.* 2021). Both these objectives may be linked to other elements in the draft strategic framework.

Quantification of conflicts between humans and wildlife could be envisaged from a surface point of view, as a complement to quantification of the harvesting of individuals in the natural environment. Pressure on the species does indeed result in the destruction, occupation by humans or change of use of the ecosystems that provided their habitats and resources. Thus, maps showing the lack of natural areas and zones where species distribution areas are shrinking may be used to visualize, quantify and localise the intensity of conflicts between humans and nature. The level of non-sustainable human footprint is another way to estimate the scale of these conflicts. Changes to these pressure maps over time provides a means of monitoring the level of human-biodiversity conflicts. This type of map may be used in this context to propose objectives regarding the percentage of surfaces where there is no conflict, for example.

These maps should also be adjusted to reflect the post-2020 framework's other objectives and targets by integrating protected areas, other areas of importance concerning nature's contributions to people and zones to be restored. This is also a justification for spatial planning of the world as a whole (see target 1).

Ex situ conservation is useful as a complement to in situ conservation (Zegeye 2016), a form of backup of the existing situation at a given point in time (Farhadinia *et al.* 2020), but we should remain vigilant to ensure that *ex situ* conservation efforts do not become a justification for destroying this diversity *in situ* or allowing it to disappear. In situ conservation involves protection of the surfaces where these organisms live and move and this is often seen as a much stronger constraint than keeping a bank of genetic samples, which appears simpler, quicker and easier to control, but which is a guarantee of the material existence of genetic resources only and not of the cultural values, which are, precisely, what guarantees their existence. In addition, it seems that *ex situ* conservation is highly inadequate for potentially useful species of wild plants, only 3% of which are well represented out of a sample of 7 000 species (Khoury *et al.* 2019a et b). *Ex situ* conservation can especially not cover all the diversity potentially present *in situ* (notably within each species) but, by definition, it disconnects the plant from its original natural environment and stops the evolutive mechanisms that are due to its interactions with the environment, with regard notably to its pathogens. Some research shows how in situ conservation makes it possible to preserve the plants' genetic diversity (Whitlock *et al.* 2016) and other research demonstrates how to manage this conservation *in situ* (Holness *et al.* 2019).

This target may be reached firstly by the achievement of target 1 (planning), which would lead to achievement of target 2 (restoration) and 3 (protection), which would support the habitats that are necessary for these populations (including target 12 regarding towns); and secondly through mitigation of biodiversity loss drivers (targets 5, 6, 7 and 8 but also 17).

Target 5

Use of wild species

Ensure that the harvesting, trade and use of wild species is sustainable, legal, and safe for human health.

Indicators:

5.0.1 Proportion of wildlife that is harvested legally and sustainably.

5.0.2 Proportion of fish stocks within biologically sustainable levels.

Target

Relevance: good

The target is satisfactory because it is ambitious. However, scientific data currently shows that legal harvesting of wildlife is at non sustainable levels. An assessment of the sustainability of legislation and also of harvesting levels must be carried out, because in the current state, the word "legal" provides no guarantee at all with regard to the sustainable use of biodiversity. Whatever the case, harvesting may under no circumstances be authorized if it poses a threat to the achievement of target 4 (conservation of the species and the genetic diversity of wildlife and domestic species). The first step towards this target should be to ensure that all the regulations guarantee sustainable use of the species, which is currently not the case.

Indicators

Relevance: average

The use of the word "legally" in indicator 5.0.1 is conditional on the regulations in force actually guaranteeing sustainability. If this term remains in the wording of the target, vigilance will be necessary to ensure that the concept of the sustainability of wildlife is integrated into legislation. This indicator seems difficult to generalize, since the sustainability of a usage could be highly localized.

Indicator 5.0.2 is of interest and could be extended to other groups of living species. It may also be used to provide information for target 10.

The legislative framework for the use of wild species should guarantee their conservation and make all non-sustainable harvesting illegal, i.e. by keeping it under the population's or species' viability thresholds (expressed in the numbers of individuals and genetic diversity). This target is therefore founded on the methods used to assess the sustainability of the populations where harvesting is carried out. In this perspective and in line with Strategic Goal A, thresholds could be set to guarantee sufficient numbers, as Hoban et al. suggest (2020), using the "500" rule, but this rule must be adjusted locally to the species under consideration. At species level, the related sustainability indicator could be the proportion of the populations of this species that are over this threshold. This is, however, a general rule and the viability threshold for a given species will depend on this species' life history traits, which makes it difficult to adopt the same approach for all species. Using the same integrating strategy as for umbrella species, these thresholds could be calculated with regard to species with a long life, later maturity and a long gestation period, for these are the most vulnerable to the loss of individuals (Wand *et al.* 2019).

Crookes et Blignaut (2019) indicate that the current assessments of the risk of exploited species extinction (notably the IUCN Red Lists) do not seem sufficiently cautious and require integration of institutional factors related to the capacity of national governments to manage this use (legislation on the management and ownership of natural resources, financial incentives and harvesting techniques). Several pressures could be active at the same time, making it extremely important to be able to assess their combined impacts, such as that of deforestation and the commercial exploitation of wildlife, which could lead to raising

the level of the threat to species (Symes *et al.* 2018, Harfoot *et al.* 2021). These underestimations of the levels of threat to some species are all the more critical because the majority of the species classified on the IUCN red lists are mainly affected by overexploitation of their populations (Maxwell *et al.* 2016), leading to the conclusion that species that are directly exploited or that live in exploited environments (notably agricultural environments), are under greater threat than appears to be the case in their conservation status.

Arguments on the ratio of domestic and wild animals in target 16 of this document show to what extent the wildlife section, with regard to biomass, has been reduced or even destroyed in favour of livestock production. In the face of these findings, it seems irrelevant to continue to draw on the wild environment, when the issue is to re-establish its surface area and quality, even if some sustainable, properly controlled local situations may allow correctly assessed harvesting. In addition, in line with the protected area model, the protection and restoration of degraded environments (targets 2 and 3) makes it possible to reconstitute the stocks of the exploited species. It is therefore necessary to put into place all the appropriate protective measures before granting any authorizations to harvest, and thus reduce the influence that the production of domestic animals has on wildlife.

The SEBI[6] initiative proposes several indicators for the exploitation of natural resources that would make it possible to monitor the level of sustainability or overexploitation of species, thus extending the taxa targeted by indicators such as the one proposed in 5.0.2. The following indicators could thus constitute a dashboard for monitoring the sustainability of the exploitation of species:

- SEBI 12: indicator relating to the Marine Trophic Index of European Seas;
- SEBI 17: indicators relating to forests and their growing stock, increment and fellings;
- SEBI 18: indicators relating to the Forest: deadwood;
- SEBI 21: indicators relating to Fisheries: European commercial fish stocks;
- SEBI 23: indicators relating to the Ecological Footprint of European Countries.

6. https://biodiversity.europa.eu/track/streamlined-european-biodiversity-indicators

Target 6

Invasive alien species

Manage pathways for the introduction of invasive alien species, preventing, or reducing their rate of introduction and establishment by at least 50 per cent, and control or eradicate invasive alien species to eliminate or reduce their impacts, focusing on priority species and priority sites.

Indicator:
6.0.1 Rate of invasive alien species spread.

Target

Relevance: average

The target remains vague with regard to methods of managing and controlling invasive alien species, but this could be improved through the monitoring indicators (see below).

Indicator

Relevance: average

The propagation rate of invasive alien species seems to meet the target's requirements only partially, insofar as their other effects are not considered. In particular, the impact of these invasive alien species is not included here. It could be included through using additional indicators such as:

- the level of priority sites where the main invasive alien species have been eradicated or controlled;
- the existence of regulations on the prevention and control of invasive alien species;
- the proportion of national biosecurity policies integrating the fight against invasive alien species.

During discussions on this topic at the CBD, it would be useful to specify that, in the context of the post-2020 global framework, the definition of invasive alien species that was adopted is the one presented in the scoping report of the corresponding IPBES assessment, which specifies that "invasive alien species are animals, plants and other organisms introduced directly or indirectly by humans in places outside their natural range, where they have settled and multiplied, creating an impact on local ecosystems and species". Species migrating naturally, due in particular to global warming, do not fall within this definition.

The interdependence of this target with those that are focused on other drivers of pressures on biodiversity should be noted. The invasive potential of a species will indeed partly depend on the life history traits of the species native to the environment in which it multiplies. These characteristics may potentially be altered by disturbances in the environments (change in land and sea use and climate change), which can favour alien species to the detriment of native species. These species also represent a danger for the ecosystem services provided by biodiversity (Kumar Rai and Singh 2020), such as agriculture, for example, for which the situations of the different countries will have different implications for the zones impacted and those from which these species originate (Paini *et al.* 2016).

Trade routes and infrastructure (especially transport) are particularly important for achieving this target. In line with targets 18 and 19 on the means of implementation, the issue of invasive alien species could be taken up by the transport and tourism sector. It should be noted that scientific publications specifically identify the species and the introduction pathways that represent a danger, in Europe, for example (Tsiamis *et al.* 2019). Other avenues are also being studied to detect these species, in particular through the use of environmental DNA. (Morisette *et al.* 2021). Research is underway on the construction of strategies to identify species with a potentially high invasive impact (Kumschick *et al.* 2014, Blackburn *et al.* 2014). It should be noted that for birds, the severity and type of impact may be assessed through several life history traits of these species (Evans *et al.* 2018).

The target could also be improved if, via its set of indicators, it pointed States towards political measures to control the sources of invasive alien species introduction, notably by setting up “whitelists” indicating which alien species are accepted on the territory (meaning those whose low invasive potential has been proved) and the establishment of quarantine systems for imported products. It could also be used to show the existence of a connection with the fight against emerging infectious diseases, because the two phenomena present common processes[7]. This strategy would be consistent with the *One Health* approach integrating human, animal and ecosystem health issues. This includes, for example, integration of the fight against invasive alien species in national biosecurity policies, which could be a relevant indicator for the first part of the target concerning the management and control of pathways for the introduction of invasive alien species. Moreover, given the controversies on the subject, success indicators could perhaps be drawn up to respond a little more precisely to the wording of the target, mentioning fewer new introductions, depending on whether the next step taken is eradication of the invasive alien species or the restoration of habitats.

An indicator on the existence of regulations for the prevention and control of invasive alien species could also measure trends in terms of political responses, legislation and management planning, to encourage structuring of the issue that these species represent in national public policies. Specifically, this would include, for example, measuring the number (or percentage) of countries that adopt international policies on the subject; the number or percentage of countries with relevant national legislation and policy; the number or percentage of countries with a prevention and control strategy for these species; the resources of affected countries allocated to their prevention and control. These types of indicators would be consistent with the one developed under the Sustainable Development Goals, in particular 15.8.1. It should be noted that the *Biodiversity Indicators Partnership* is responsible to collect data and update the indicator, used between 2010 and 2020 to monitor Aichi Objective 9. Data on the occurrence of invasive alien species is also compiled by IUCN and can support the development of these national regulations and the identification of priority species, such as the Global Register of Introduced and Invasive Species. (http://griis.org/download) or the global invasive species data base (http://www.iucngisd.org/gisd/).

A major summary, carried out over more than 5 years (InvaCost), made it possible to publish the first global database on the costs generated by invasive alien species, with more than 13,000 standardized costs broken down into 64 descriptors on 970 species invading 176 countries. The research team demonstrated that the total reported costs of invasions reached a minimum of 288 billion US dollars (2017 US dollars) over the past decades (1970-2017), with an average annual cost of 26.8 billion US dollars(https://invacost.fr/resultats/).

7. See : https://www.fondationbiodiversite.fr/a-lombre-de-la-mondialisation-les-epidemies-se-propagent/

Target 7

Pollution

Reduce pollution from all sources to levels that are not harmful to biodiversity and ecosystem functions and 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.

Indicators:

7.0.1 Index of coastal eutrophication potential (excess nitrogen and phosphate loading, exported from national boundaries).

7.0.2 Plastic debris density.

7.0.3 Pesticide use per area of cropland.

Target

Relevance: good

Although the objectives in terms of reducing pesticides and plastics are adequate for the challenges identified by scientific work, a 50% reduction in rejected nutrients is only one step towards a more ambitious reduction by 2050.

Indicators

Relevance: average

Other forms of pollution should be reflected in the indicators, since they affect biodiversity, even if they are not mentioned in the target:

- proportion of healthy soils;
- proportion of land and sea subjected to nocturnal illumination;
- number of oil-related incidents reported.

Note the two indicators related to target 6.3 of the sustainable development goals that may be relevant for the global framework:

- proportion of wastewater treated;
- proportion of watercourses and bodies of water with good water quality.

The freshwater quality indicator, proposed in a previous version of the global framework, was relevant, since it makes it possible to measure almost all the pollutants identified in this section: phytosanitary products, persistent organic pollutants, those that are of urban and industrial origin (for example, PCBs, PAHs, PFOAS), petroleum compounds, but also antibiotics and, in general, a large majority of pharmaceuticals or biocides. It also makes it possible to capitalize on the monitoring carried out for target 6.3 of the Sustainable Development Goals, which includes, as an indicator, the proportion of rivers and bodies of water of good quality. (Tickner *et al.* 2020). The potential eutrophication index only covers one aspect of aquatic and marine pollution (nutrients), whereas the good quality of water indicator would integrate, in addition to nutrients, antibiotics and other pharmaceutical products, endocrine disruptors, biocides, transformed nanomaterials, plastics and micro-plastics and, to a lesser extent, light and sound pollution (these last two are still rarely integrated into scientific monitoring) (Reid *et al.* 2019).

We do not, however, have an equivalent for land environments. We therefore propose the addition of an indicator on soil quality, as this would make it possible, in addition to the agricultural pollutants targeted by indicator 7.0.3 on the use of pesticides, to deal with other types of pollution, such as that by heavy metals, in environments other than agricultural areas. In this respect, the Intergovernmental Technical Panel on Soils has defined the state of soil health as "the ability of soils to maintain the productivity, diversity and environmental services of terrestrial ecosystems". A selection of indicators is underway within this Technical Group and the Global Soil Partnership[8]. The Intergovernmental Technical Group on Soils could be approached to see if these indicators may be used for monitoring the global framework for biodiversity. In general, it will be necessary to ensure that the main types of pollution can be covered by the indicators defined in this target, in particular pollution resulting from mining activities, agriculture, aquaculture, pulp and paper production, gas and mining production, urban effluents, etc.

The global monitoring plan for persistent organic pollutants established by the Stockholm Convention[9] can also provide valuable indicators for monitoring target 7. This indicator seems to us to have a higher degree of priority over those suggested below, since issues related to the biodiversity of soils are today at a high level of alert within the scientific community.

The eutrophication indicator should nevertheless be kept, in addition to the indicator related to the quality of water bodies, because it provides more specific information on the part of the target devoted to the reduction of nutrient discharges, notably nitrogen.

We suggest the addition of an indicator on air quality, which would make it possible to cover various types of pollution affecting ecosystems, notably atmospheric pollution.

Other types of pollution are growing concerns for biodiversity, such as light and noise pollution, which disrupts the species' life cycle (feeding, reproduction, etc.). These concerns should also be integrated into the global framework via the set of indicators. With regard to light pollution (which is targeted in the 2016 French law on the reconquest of biodiversity), this could be monitored via satellite images, and we could thus calculate the surface of natural areas with night lighting. To date, we have no potential means of providing an overall indicator of noise pollution on species. Other sources of pollution can be included, such as frequent accidental pollution (e.g. oil spills during incidents at sea or on land).

It should be noted that the objective of halving the amount of nutrients released into the environment by 2030 is only a milestone and that we should aim for a 100% reduction by 2050, which would also leave time to transition to agroecology (see Poux and Aubert 2018). This mainly concerns nitrogen and phosphorus. On the basis of research by Meier *et al.* (2017, see figure 2 below), the use of nitrogen, mainly in the agricultural sector, is almost 150% higher than the estimated limits for the biosphere, whilst that of phosphorus, of which three-quarters is associated with the agricultural sector, exceeds biosphere limits by 100%. Poux and Aubert (2018), see no way out other than the gradual cessation of synthetic nitrogen use, in view of its effects on all the ecosystems, notably aquatic ecosystems. This target goes hand in hand with targets 9 and 10, in order to respond to food-related problems, which could cause political tensions, and it appears important to be able to link the ambition of target 6 with that of targets 9, 10 and 11, since there is more consensus on the latter.

This target is closely linked to target 15 on modes of production and consumer practices. The mass of matter associated with humans (or "anthropogenic mass" such as plastics or buildings and other human infrastructure) exceeds the total biomass of living things on the planet (Elhacham *et al.* 2020). This is an illustration of the difficulties encountered in the fight against the effects of pollution on biodiversity, which will be the case as long as there is no drastic decrease in emissions (macro and micro pollutants, GHG, etc.).

On the basis of INRAE research, an initial proposal for a 42% reduction of pesticides without loss of agricultural yields is said to be possible in France (last round table JFRB 2018, or Lechenet *et al.* 2017). A European-wide study (Poux and Aubert 2018) has demonstrated that by moving towards a pesticide- and chemical input-free agricultural model (agroecology) by 2050, agricultural production would show a 35% kcal decrease compared with 2010 levels, but would, nevertheless, provide the food required by European populations and maintain the capacity to export agricultural products, whilst reducing greenhouse gas emissions in the agricultural sector by 40% (see figure 2).

8. http://www.fao.org/3/cb1110en/cb1110en.pdf
9. http://www.pops.int/Implementation/GlobalMonitoringPlan/Overview/tabid/83/Default.aspx

However, within the framework of the Convention on Biological Diversity, different figures could be examined, at global level, or with a breakdown into regional targets, given the food issues and the degree of pressure caused by bio-aggressors, which varies according to the continents. It should be noted that the pollution of ecosystems by synthetic products, inputs and pesticides will persist for several years in the environment after the objectives for reducing sources of pollution have been achieved, due to the persistence of molecules in the environment.

We can emphasize the importance of the different elements of the target by following Eco Health reasoning: all these sources of pollution pose problems for human health and the implementation of the global framework for biodiversity will therefore be extremely beneficial for human health. Here, the proposal is to prefer the term “Eco Health” rather than “One Health” because the “One Health” scientific field is dominated by the medical and veterinary sciences, with little representation of environmental disciplines, whereas the Eco Health approach is all-encompassing.

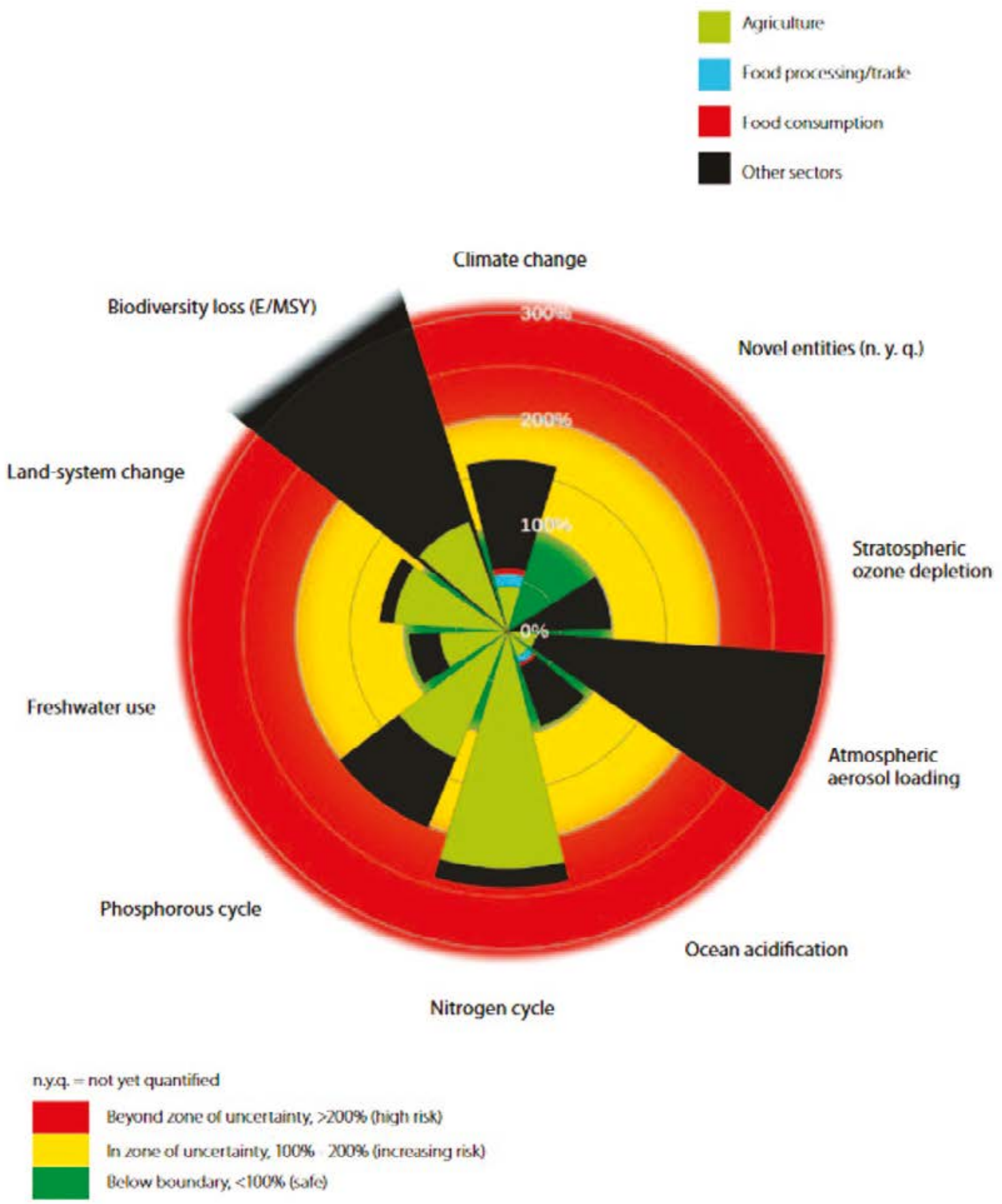


FIGURE 2 : FRACTION OF AGRICULTURE AND NUTRITION ATTRIBUTABLE TO THE TOTAL ENVIRONMENTAL BURDEN AND CORRESPONDING PLANETARY BOUNDARIES. FROM: MEIER *et al.* 2017

Target 8

Climate change

Minimize the impact of climate change on biodiversity, contribute to mitigation and adaptation through ecosystem-based approaches, contributing at least 10 GtCO2e[10] per year to global mitigation efforts, and ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity.

Indicator:
8.0.1 National green-house gas inventories from land use and land use change[10].

Target

Relevance: low

The wording of the target is correct, reflecting the main issues regarding biodiversity and climate change, but the suggested figure of 10 GtCO2e under-estimates the contribution that ecosystem-based approaches may provide for mitigation of climate change and minimizes the potential of these approaches for contributing to biodiversity preservation. Moreover, it only partially addresses reduction of global warming as one of the five main drivers of the pressures on biodiversity.

Indicator

Relevance: low

The proposed 8.0.1 indicator only concerns emissions caused by ecosystem degradation. To respond to the details of the target, it must be complemented by an indicator of the emissions avoided through preservation of the ecosystems and the volume of greenhouse gas absorbed by the restored ecosystems. The surface area of the ecosystems used for mitigation and adaptation to climate change may be disaggregated in a *Preserved Natural Ecosystem and Restored Natural Ecosystem*.

These indicators might be informed by the reports of the States that are Parties to the United Nations Framework Convention on Climate Change.

A second indicator may be added, detailing the quantities of CO_2 stored by these preserved and restored ecosystems.

Furthermore, the average temperature indicator (which can be scaled down from global to local level) would also be relevant for measurement of the pressure of climate change on biodiversity.

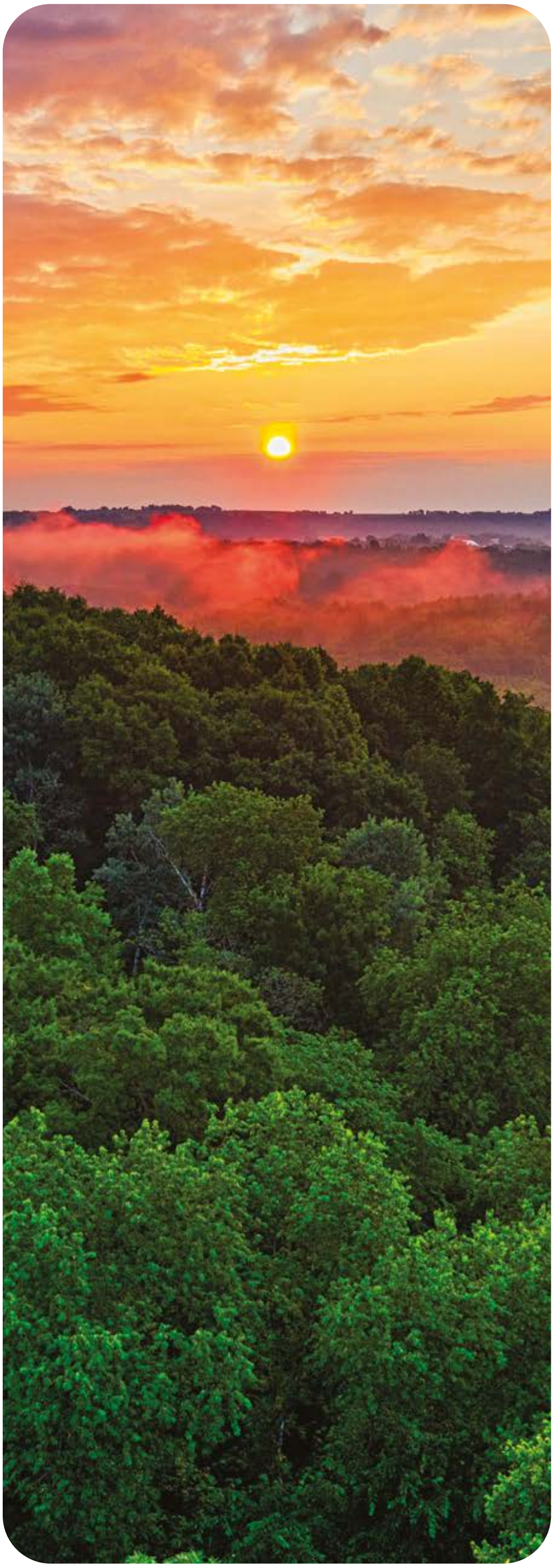
We can remind those who would like to limit climate issues to bodies other than the CBD that IPBES has identified climate change as one of the five major drivers of the pressures on biodiversity. Thus, since the mandate of the CBD is to solve the problem of biodiversity loss, it must address the fight against climate change. (Turney *et al.* 2020). The climate issue only makes sense because it is a threat to life on the planet, it is not an end in itself and its resolution should not be to the detriment of biodiversity, but in synergy with it. Up till now, most existing international biodiversity targets have neglected the impacts of climate change. At the same time, climate change mitigation measures can directly harm biodiversity. A significant number of targets in the draft post-2020 framework are at risk of being seriously compromised due to climate change, even if other obstacles to their

10. GtCO2e: giga (109 tons of carbon dioxide equivalent. This calculation expresses in a single unit (carbon dioxide) the cumulative effect on the climate of different greenhouse gases (including for example methane and nitrous oxide) It is calculated by weighting each greenhouse gas according to its global warming power reduced to the reference value of carbon dioxide. A tonne of a gas with a warming power of two times that of CO2, will equal 2 tonnes of CO2 equivalent.

achievement were to be removed (Arneth *et al.* 2020). Target 8 could address reduction of global warming, taking up the words of the Paris Agreement on this subject: "Restrict the rise in the average temperature of the planet well below 2°C compared to pre-industrial levels, contribute to mitigation and adaptation measures through ecosystem-based approaches…". An international consensus has already been reached on the 2°C target. Cross-referencing with the Climate convention would, moreover, contribute to strengthen links between the three Rio agreements, which is necessary if the international community really wishes to respond to the major environmental challenges of today[11]. States that are reticent about the inclusion of mitigating climate change in the post-2020 global framework could find themselves up against opposition based on Decision X/33 of the CDB[12] in which the Conference of the Parties invites the Parties, amongst others, to "reduce the negative impacts of climate change as much as possible at ecological level, via conservation and sustainable management strategies to preserve and restore biological diversity". In reality, current political commitments to reduction of greenhouse gas emissions would produce global warming of 2.3–4.1°C by 2100. It is clearly necessary to capitalize on the mitigation potential of climate change through the preservation of current carbon-rich ecosystems and the restoration of degraded land.

Discussions in the scientific and political arenas on climate and biodiversity in recent years have crystallized around the use of the terms "nature-based solutions" or "ecosystem-based approaches". We recommend keeping the expression "ecosystem-based approaches" as it is currently proposed in the wording of target 8, since this is the term accepted and used within the Convention on Biological Diversity. Indeed, in the IPBES and IPCC workshop report of June 2021 (Pörtner *et al.* 2021) the experts declared that: "[the term 'nature-based solutions' (as defined by the IUCN)] is not universally accepted in international policies […] and scientists have expressed their reservations about its use, amongst other things, because the term is sometimes used to designate measures with negative impacts on biodiversity and quality of life".

Generally speaking, the solutions highlighted by research works as being the most beneficial for biodiversity are those which favour the preservation of existing ecosystems and the regulatory services provided to people, as opposed to solutions that create or replace ecosystems. Studies notably underline the strong potential of protected areas to capture and store carbon (Dinerstein *et al.* 2020), illustrating the



11. https://www.fondationbiodiversite.fr/plaidoyer-pour-une-cop-15-biodiversite-ambitieuse-et-pour-un-rapprochement-des-conventions-issues-de-rio/
12. https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-33-fr.pdf

link between target 8 and targets 2 (restoration of ecosystems) and 3 (protected areas) of the framework. That is why an indicator reflecting the contribution of protected and restored natural ecosystems to the capture and storage of carbon would provide particularly useful insights in relation to the indicator that is currently proposed, which only concerns emissions caused by changes in land use. The indicator could also be disaggregated between land and sea areas.

Scientific research concludes that around 35% of mitigation objectives may be provided today by approaches based on ecosystems (Griscom *et al.* 2017). The objective of climate change mitigation by the ecosystems amounting to 10 Gt CO2e is considerably less ambitious than the 30% suggested in the first version of the global framework. According to IPBES and IPCC statistics (Pörtner *et al.* 2021), annual greenhouse gas emissions are at least 55 GtCO2e per year. The 10 GtCO2e objective proposed for the framework therefore represents only 18% of total emissions, well below the capacities envisaged by scientists. Table 2 takes up the items of the IPBES and IPCC report that present the potential mitigation of climate change of the main ecosystem-based approaches:

4.

	Min ($GtCO_2e$/an)	Max ($GtCO_2e$/an)
Reforestation and restoration of forests	1,5	10,1
Reduction of forest deforestation and degradation	0,4	5,8
Agroforestry	0,1	5,8
Restoration and reduction of the conversion of coastal wetlands	0,3	3,1
Improvement of sustainable forest management	0,4	2,1
Restoration and reduction of peatland conversion	0,6	2
Integrated water management	0,1	0,72
Reduction of the conversion of meadowlands in crop-growing zones	0,03	0,7
Preservation of biodiversity	0,9	0,9
Fisheries, aquaculture and changing diets	0,48	1,24
Coastal and marine ecosystems	0,5	1,38
TOTAL	**5,31**	**33,84**
MEDIAN	**20**	

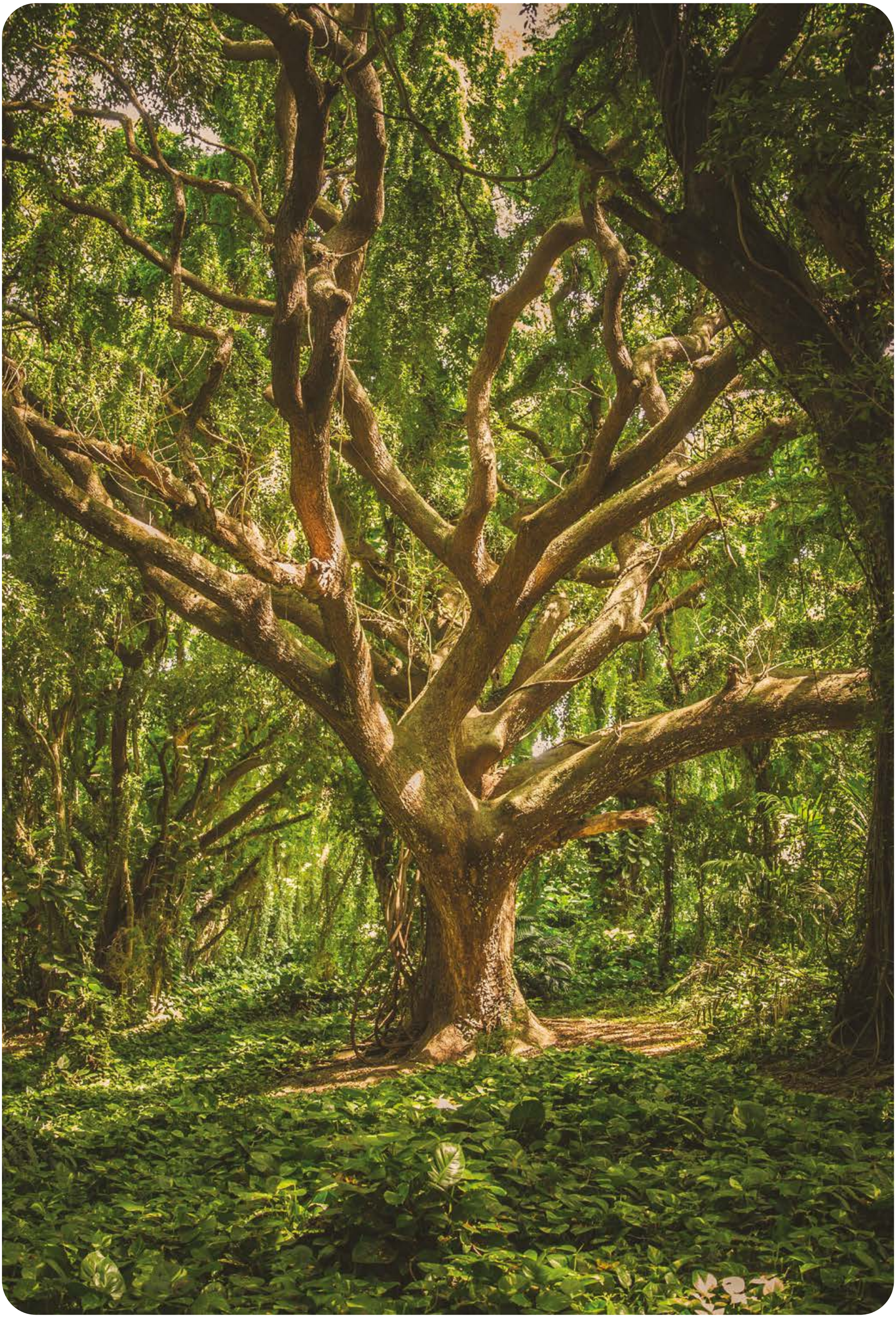
TABLE 2: MINIMUM AND MAXIMUM MITIGATION POTENTIAL (GIGATONS OF C02 ANNUAL EQUIVALENT) OF DIFFERENT ECOSYSTEM-BASED APPROACHES

A target that would propose a contribution of 19 to 20 $GtCO_2e$ from the ecosystems would be a better match with the most recent scientific estimates. However, the decision to choose an absolute value reflecting the total capacity of ecosystem-based approaches to contribute to mitigation of climate change, does seem to be a wise one, because the part played by ecosystems in the total mitigation efforts will vary, on the basis of the efforts required. These will fluctuate between now and 2030, depending on efforts made to reduce greenhouse gas emissions by the different sectors.

The last segment of the proposal for the target, “ensure that all mitigation and adaptation efforts avoid negative impacts on biodiversity”, is of paramount importance. Scientific research shows that there is a significant overlap of areas of interest both in terms of carbon sequestration and biodiversity preservation, while prioritization of climate measures focused on carbon sequestration can lead to losses of biodiversity (notably changes of land use, see Pörtner *et al.* 2021). Since soils are the most important land reservoirs of carbon, containing, overall, more carbon than living biomass and the atmosphere, any strategy leading to the release of carbon from the soil is harmful here (Cifuentes-Croquevielle *et al.* 2020). In particular, planting, as envisaged in certain solutions to sequester carbon, can be the source of carbon emissions, in addition to biodiversity losses in soil invertebrates, compared with native forests. A warning should therefore be issued concerning the risk that manipulation of the ecosystems to achieve climate-related objectives can be detrimental to biodiversity.

This target within the global framework for biodiversity should be echoed in the UNFCCC studies, to increase its chances of being implemented. Ecosystem-based approaches have similar aims to the CBD Vision of living in harmony with nature, since they propose the shared benefits of biodiversity conservation and climate regulation. In the opposite strategy, the risk linked to geo-engineering solutions for climate control may have a counter-productive effect on biodiversity preservation policies and individual behaviour: capture of pollutants or greenhouse gases, for example, through technological solutions alone, may lead governments and individuals to reduce their efforts to reduce emissions of pollutants or GHGs, which could result in them rushing ahead towards an escalation of emissions, which will constantly require more geo-engineering to prevent their impacts (Corner and Pidgeon 2014). Ecosystem based approaches, and ongoing changes in behaviour and sectors of activity, especially through the transformative changes as described by IPBES, seem a more sustainable strategy than technology-based solutions which go no further than simply slowing down the degradation of the environment. There is already some doubt as to the value of these technologies for climate policies, making integration of biodiversity issues in these strategies more than unlikely (Lawrence *et al.* 2018). In addition, McCusker *et al.* (2015) illustrate that some of these technologies, although they are deemed to have potential to mitigate world-wide changes, may, however, not produce the desired effects.

This target is also very closely linked to targets related to production models and consumer practices (15 and 16), and ecosystem-based approaches alone may not compensate for GHG emissions (Anderson *et al.* 2019). For example, production systems must change to reduce, or in any case, initially limit the impacts of climate change on biodiversity, especially since this biodiversity is itself a source of sustainable development solutions in the long term. Without these changes in emissions from the global food system, the goals of the Paris Agreement and the objective of staying under +1°C may not be achieved. (Clark *et al.* 2020).



Strategic Goal B

Use - Stop the decline in nature's contributions to people

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.

Milestone B.1
Nature and its contributions to people are fully accounted and inform all relevant public and private decisions.

Milestone B.2
The long-term sustainability of all categories of nature's contributions to people is ensured, with those currently in decline restored, contributing to each of the relevant Sustainable Development Goals.

Indicator:
B.0.1 National environmental economic accounts of ecosystem services.

Strategic Goal

Relevance: good

The revised objective is much more satisfactory than that of the *Zero Order Draft*, notably because its related milestones help to explain nature's different contributions to people, beyond material contributions.

Indicator

Relevance: average

The integration of nature's contributions to people into national accounts makes it possible to respond both to Milestone B.1 (assessment of nature's economic value allows better integration into the various policies) and Milestone B.2 (national accounts make it possible to follow developments in the state of the different ecosystems).

Recent studies demonstrate that nature's capacity to respond to people's needs has decreased for most of the material, immaterial or regulatory contributions assessed (Brauman *et al.* 2020). This reduction may especially be observed in regulatory services, whereas the production of material goods (food or materials) has increased, but often to the detriment of sustainability (exhaustion of biotic or abiotic resources and destruction), which means that this increase will not continue in the long term. Social adaptations or alternative solutions partly compensate for this decrease, but are imperfect, potentially costly, unequally distributed or available and will probably become inefficient in the medium or long term. (Brauman *et al.* 2020).

The proposal is to use the assessment framework suggested by Brauman for the purposes of monitoring progress made in pursuit of Strategic Goal B, especially Milestone B.2. Providing information for the indicators proposed in Figure 3 above would make it possible to complete ecosystem accounting (Milestone B.1, indicator B.0.1), but would also allow the updating of the table based on a qualitative assessment of the status of nature's contributions to people. Brauman's assessment concerns the period 1970-2020: it could be updated in 2030 and 2050, whilst noting that timescales are shorter in the context of monitoring implementation of the post-2020 global framework for biodiversity and that, therefore, improvements to these trends are difficult to assess and will require progress in the area of indicators and the related observatories.

	NATURE'S CONTRIBUTION TO PEOPLE	POTENTIAL CONTRIBUTION	REALIZED CONTRIBUTION	ENVIRONMENTAL CONDITION	IMPACT ON PEOPLE
REGULATING	Habitat	Habitat to support desired species			
REGULATING	Pollination & seed dispersal	Pollinator diversity & abundance	Pollinator - plant overlap	Pollinated plant diversity & abundance	Health from pollinated foods
REGULATING	Air quality regulation	Amount of burnable biomass or pollution entraining vegetation	Burned vegetation & actual pollution entrainment	Air quality	Air pollution-driven mortality
REGULATING	Climate regulation	Potential GHG sequestration by existing ecosystems	Actual GHG sequestration, including land management	GHG concentration	Climate-driven mortality & costs
REGULATING	Ocean acidification regulation	Potential CO_2 sequestration by existing ecosystems	Actual CO_2 sequestration by existing ecosystems	Ocean acidification	Nutrition & income from shellfish & coral reefs
REGULATING	Water quantity & flow regulation	Potential water modulation by existing ecosystems	Actual water modulation by existing ecosystems	Available water	Available water relative to demand
REGULATING	Water quality regulation	Extent of filtering ecosystems	Actual ecosystem removal of pollutants	Water quality	Health from water pollution & cost of water treatment
REGULATING	Soil formation & protection	Extent of ecosystems that create soil fertility	Soil fertility, reflects land use	Soil fertility, reflects ability to use soil	Soil-driven health and income
REGULATING	Hazard regulation	Existence of hazard-reducing ecosystems	Actual ecosystem hazard reduction	Incidence and severity of hazards	Hazard-driven health & income
REGULATING	Pest regulation	Pest enemy diversity & abundance	Actual control of pests	Vector borne disease & pest-driven damage	Health from vectorborne disease & cost of pest damage
MATERIAL	Energy	Extent of agriculture & forest land for bio-energy	Bioenergy harvested		Bio-energy-driven income and security
MATERIAL	Food & feed	Extent of food producing land & ocean fish stocks	Amount and nutrition of harvested food & feed		Nutrition & income from food & feed
MATERIAL	Materials	Extent of agriculture and forest land for materials	Amount & quality of harvested materials		Employment & income
MATERIAL	Medicine	Overlap of species diversity & knowledge	Medicinal species in use		Health from natural medicines
NON-MATERIAL	Learning & Inspiration	Natural diversity in proximity to people	Actual learning from nature		Income & wellbeing from bio-inspiration
NON-MATERIAL	Experience	Natural & traditional landscapes in proximity to people	Actual physical and psychological experiences in nature for rich/urban & poor/rural people		Nature-driven quality of life for rich/urban & poor/rural people
NON-MATERIAL	Identity	Land use stability to influence identity	Actual shaping of identity by nature for rich/urban & poor/rural people		Nature-driven quality of life for rich/urban & poor/rural people
NON-MATERIAL	Options	Amount and diversity of nature to provide future benefits			

Trend since 1970: Worse Little change Better Regional differences: Different results among indicators:

Confidence scale: Quantity and quality of evidence: ○ Low ● Robust

Level of agreement: △ Low ▲ High

FIGURE 3 : FROM BRAUMAN *ET AL.* 2020

This objective is to be linked with target 15 on sectoral integration, notably to respond to Milestone B.1. The use of the indicators presented in Figure 3 would allow an objective view of the dependency of some sectors, such as agriculture (pollination, soil fertility, pest control, and bioenergy), transports and industry (air quality and greenhouse gas emissions) and water (water quality) and to mobilize them to monitor the development of these contributions by nature to people.

Targets 9 to 12 below are applications of the actions to take in order to respond to Strategic Goal B of the framework.

Target 9

Material services

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.

Indicator:
9.0.1 National environmental-economic accounts of benefits from the use of wild species.

Target

Relevance: average

Care should be taken to ensure that this target does not drive overexploitation of wild species, and that it does not become dominant to the detriment of target 4 on conservation of the species and population reconstitution programmes, both in and outside protected areas. Target 4 addresses the risks of conflicts between conservation and exploitation of wildlife. Any solution that is harmful for achievement of targets 1 to 8 may not be described as sustainable. This target must guarantee an alternative for local populations when recourse to wild species to meet primary needs leads to local biodiversity loss.

Any observed deficit of ecosystem services in a given area is a reason to strengthen biodiversity there.

Indicator

Relevance: low

Indicator 9.0.1 does not include the question of the sustainability of the populations that are exploited and may exacerbate the loss of biodiversity, especially if there are variations in biodiversity and the benefits of its use. In addition, we do not know how to interpret this information, should the needs of the local populations decrease, for example. We could envisage alternative indicators, such as the number of species used in agriculture, including auxiliary wild species, or the number of species related to crop-growing (agrobiodiversity).

It is difficult to see how the upward trend of indicator 9.0.1 will be correlated with benefits for biodiversity. We might even fear the opposite. If, overall, we observe improvements in the state of wild populations (in particular via indicators A.0.2 and A.0.4) and at the same time and in the same ecosystems, an increase in the economic benefits derived from their use (indicator 9.0.1), we could deduce that there is an improvement in the sustainability of the practices targeted by target 9. An increase in all these indicators would seem to indicate that the practices are locally sustainable, because on the one hand the wild populations are in better health and on the other hand, an increase in the benefits from their use and management is observed. However, the sustainability of local practices is affected by external social, economic and environmental changes, which may exceed the scope of local populations (e.g. logging in a context of industrial deforestation, nomadic herding in a context of desertification, seed management in a context of agricultural intensification).

Dominant intensive agricultural practices threaten its very existence because they lead to the loss of organic matter, greenhouse gas emissions, excess fertilizers, erosion, pollution of ecosystems, acidification of the oceans, land salinization and loss of the genetic diversity of agricultural species. This continued destruction of soils reduces their long-term ability to support ecosystem services including food production. (Tsiafouli *et al.* 2014, Baude *et al.* 2019, Vazquez *et al.* 2020, Panagos *et al.* 2018, Kopittke *et al.* 2019, Thaler *et al.* 2021). Thus, it seems that in 2002, 22% of cultivated areas, meadows and forests and other wooded areas have degraded soil. (Chen *et al.* 2002). Biodiversity losses are combined with food security risks, which are currently more evident in more extreme environments and more vulnerable populations (FAO 2020). This would also seem to be one of the causes of the stagnation in major field crop yields, particularly in Europe. (Ray *et al.* 2012, Schauberger et al. 2018). The loss of microbial diversity in soils leads to an increase in antibiotic resistance in microorganisms that can affect human health (Chen *et al.* 2019). Overall, food diversity is decreasing through homogenization driven by intensive agriculture, with a small number of species contributing to the world's food supply (FAO SOW2, Khoury *et al.* 2018), which would put food security at risk if these few species were threatened. This homogenization of the species used in agriculture extends to the biodiversity associated with these crops and communities, at landscape level (voir Ponisio *et al.* 2015). Alternative indicators could be considered, such as the number of species used in agriculture, or the number of species linked with crops (agrobiodiversity). It should be noted that there are currently no studies on the minimum level of agricultural diversity that would guarantee the provision of the services listed in target 9.

Target 10

Agriculture

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.

Indicators:

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).

Target

Relevance: average

Rather than focusing on productivity, the wording of the target could reflect the other benefits provided by the agroecosystems and that are necessary for them to be resilient, such as regulation services, or even cultural services.

A more precise target might be to achieve an objective of 20% minimum natural areas in the agricultural landscapes and forests that are worked. Another possibility would be to set an objective on the diversity of crop rotations. It would be equally important to associate agricultural landscape sustainability with other benefits for biodiversity and ecosystem services.

Indicators

Relevance: average

This set of indicators depends on the definition of the concept of "sustainability", which can vary according to social, economic, and environmental contexts.

Another approach integrating agricultural production and biodiversity is the question of the re-diversification of agricultural landscapes.

Indicators on the size of plots, the diversity of crops and the presence of semi-natural elements (in particular the principle of 20% natural or semi-natural spaces) also make it possible to have an integrative indicator to measure progress towards this target.

There is no aquaculture indicator (quantities of antibiotics, food origin, nitrate discharges, etc.).

Agriculture is one of the major sectors of activity with a strong influence on biodiversity loss (Kehoe *et al.* 2017, Medeiros Jacob *et al.* 2021) through the change in land use, pollution and climate change that it generates. About 40% of productive land has been converted to agricultural land, two-thirds of boreal forests are under some form of management, 90% of fishing areas are overexploited or completely exploited, and aquaculture is a rapidly expanding sector that occupies an increasing amount of space in coastal and marine areas (Nyström *et al.* 2019). The extremely negative effects of intensive agriculture on biodiversity have been widely documented by science. As a leading sector of activity in terms of its impact on biodiversity, the agricultural sector must be transformed, otherwise several targets of the draft post-2020 framework may not be completely achieved (in particular targets 7, 8, 9 and 10) thus jeopardizing the achievement of the CBD Vision 2050.

Ensuring the resilience of the agricultural sector also requires transformational change: the dominant form of agriculture, based on intensive and industrial production, tends to alter the microbial biodiversity of soils, yet this biodiversity is the basis of soil fertility. (Tsiafouli *et al.* 2015, Xu *et al.* 2020). Special attention must be paid to genetic locking implying that the dominant varieties and breeds used in intensive agriculture can only be cultivated and bred using large amounts of inputs and practices with a strong impact on the environment and biodiversity. This reduction in the genetic diversity of agricultural species homogenizes the environments in which they are established and impoverishes global food supplies, with risks in terms of food security. (Khoury *et al.* 2014). This calls for a re-diversification of agriculture with species, varieties and breeds that are more suited to local conditions, with inputs giving less cause for concern, and more resilient to future climate change (see for example Mazé *et al.* 2021). The fight against the homogenization of biodiversity in agrosystems may also take the form of diversification through the establishment of heterogeneous crop mosaics in the landscapes, (Sirami *et al.* 2019), but also by the cultivation of varieties adapted to low-input systems to replace varieties suited to intensive agriculture (Ceccarelli and Grando 2020, Mazé *et al.* 2021). A meta-analysis of more than 3700 experiments shows that, whatever the context, a combination of several diversification strategies (rotations, intercrops, agroforestry, etc.) always shows better performance (biodiversity, yield, soil quality, etc.) than any single strategy (Beillouin *et al.* 2019, also see Beillouin *et al.* 2021). Some of the CAP provisions are dedicated to the re-diversification of crops (rotations and endangered varieties) and the complexification of landscapes (hedges, meadows and strips of flowers or grass) and this could be assessed through ad hoc indicators. This notion of resilience largely overlaps with the analysis and indicators proposed for target 9 (see above).

Agriculture can also be a source of solutions and have positive impacts to halt biodiversity loss, while providing services to people. This is especially the case when agricultural practices strengthen the resilience and sustainability of agroecosystems, while ensuring a satisfactory level of production. Scientific studies (Garibaldi *et al.* 2020) show that if a minimum proportion of 20% of so-called "native" natural spaces (meaning with communities of local organisms)is preserved in the agricultural and forest landscapes being worked (the *working landscapes*), numerous benefits may be obtained in terms of food security and ecosystem services (see also Medeiros Jacob *et al.* 2021), but also in terms of the connectivity and efficiency of the network of protected areas in the biomes where protected areas are under-represented. The recommended proportion of native spaces may rise to 50% in some landscapes.

It is necessary to take into account the other services derived from exploited ecosystems beyond the simple productivity aspect dealt with here, and especially to illustrate that the conservation of biodiversity does not restrict development. Numerous studies now demonstrate the costs, or at least the impacts, that the loss of biodiversity entails on the provision of services, particularly in agriculture. (Dainese *et al.* 2019).

This target should be compared with targets 14, 15 and 16 on the necessary societal changes, as well as with target 18 on harmful subsidies that lead to a loss of biodiversity and its ecosystem services.

Target 11

Regulating services

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.

Indicator:
11.0.1 National environmental-economic accounts of regulation of air quality, quality and quantity of water, and protection from hazards and extreme events for all people, from ecosystems.

Target

Relevance: good

This target is a helpful supplement to target 8 on the limitation of the harmful effects of climate change solutions on biodiversity, since target 11 aims to optimize the positive contribution of the maintenance or restoration of biodiversity to the fight against climate change, to the regulation of air quality, water quantity and water quality, and to protection against extreme events.

Indicator

Relevance: good

The proposed indicator provides a correct focus on the contributions of nature identified in the target.

Research shows that biodiversity is not only a victim of climate change. It is also involved in its regulation. Thus, biodiversity loss exacerbates climate change that has already been set in motion by excess greenhouse gas emissions from human activities, or it may emit additional greenhouse gases (e.g., carbon emissions from forests or peatlands). This underlines the importance of planning (target 1) to locate the ecosystems that are critical for those services that we wish to preserve (for example, in urban areas, see the link with target 12), in order to give priority in urban areas to regulation services rather than supply chain services.

This target will require efforts to assess the potential and capacity for air and water purification by ecosystems as well as their capacity to protect coastlines against floods and other extreme events. Thus, the loss of biodiversity, the decline in air quality and the increase in pollutants in the air are correlated with the spread of the Covid-19 pandemic. (Fernandez *et al.* 2021). These assessments must be cross-checked with the surfaces of existing natural spaces, or those that are to be restored, addressed by Strategic Goal A and targets 2 (restoration) and 3 (protection), as well as by the surfaces mentioned in target 10: 20% of native natural spaces in the "working landscapes". This target will make it possible to maximize the synergies between conservation and the contributions of biodiversity to people. With regard to the targets on pollution (target 8), climate change (target 9) and green and blue spaces in the city (target 12), the potential of urban ecosystems in regulating and purifying the air, although they are real, may have a limited effect compared with the rate of emissions of pollutants and greenhouse gases from urban centres (Baro *et al.* 2014). It will be necessary to find compromises between services (for example, between regulation services and cultural services) (Peña *et al.* 2018).

Another indicator to explore is the proportion of investments made in development projects to encourage ecosystem-based approaches to improve the quality of air, water and the protection against health or climate risks, for example, the "percentage of ecosystem-based projects to improve air quality" or the "amounts invested in ecosystem-based projects to improve the resilience of populations to risks".

Target 12

Cities

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.

Indicator:
12.0.1 Average share of the built-up area of cities that is green/blue space for public use for all.

Target

Relevance: good

The positive contributions of green and blue spaces to urban biodiversity, human health, climate change mitigation and adaptation are very well documented.

Indicator

Relevance: average

The indicator does not reflect some aspects of the target. Complementary indicators could be envisaged for measuring, firstly services provided by the green and blue spaces and secondly, accessibility to these spaces, which is only partly covered by the current wording of the indicator.

It will also be necessary to measure the biological diversity of these spaces: the diversity of the species present and the abundance of their populations.

The positive contributions of green and blue spaces to urban biodiversity, human health, climate change mitigation and adaptation are very well documented. (Flégeau 2020).

The surfaces covered by this target may be associated, as mentioned in target 10 (sustainable management of anthropized systems), with the surfaces covered by targets addressing conservation of wild natural spaces and the proportion of 20% of native planted spaces in order to maximize the synergies between conservation and the contributions of biodiversity to people (Garibaldi *et al.* 2020).

This target must not be detrimental to target 6 on invasive alien species in terms of the choice of species for urban planning and the risk of invasions.

Two recent summaries examine the potential effect on well-being and mental health of "blue" (Beute *et al.* 2020a) or "green" spaces (Beute *et al.* 2020b) in urban areas, and on the characteristics of these spaces (Also see McKinnon *et al.* 2019) and conclude that there are numerous positive effects, depending on the context, and that documentation of these aspects is improving...

The indicator that is currently proposed does not make it possible to measure the effects of the green and blue spaces on the health and well-being of the populations. A complementary indicator could be created, taking up the items of the UN System of Economic and Environmental Accounting proposed for indicator 12.0.1, and which could apply to the flows of CO^2 stored and released by the green and blue spaces, isolating the data on urban ecosystems. The *City Biodiversity Index* (see Chan *et al.* 2021), published in CDB *Cahier Technique* No. 98 (2021) presents indicators, the calculation method that they use and the sources of the data available for the provision of information on these aspects:

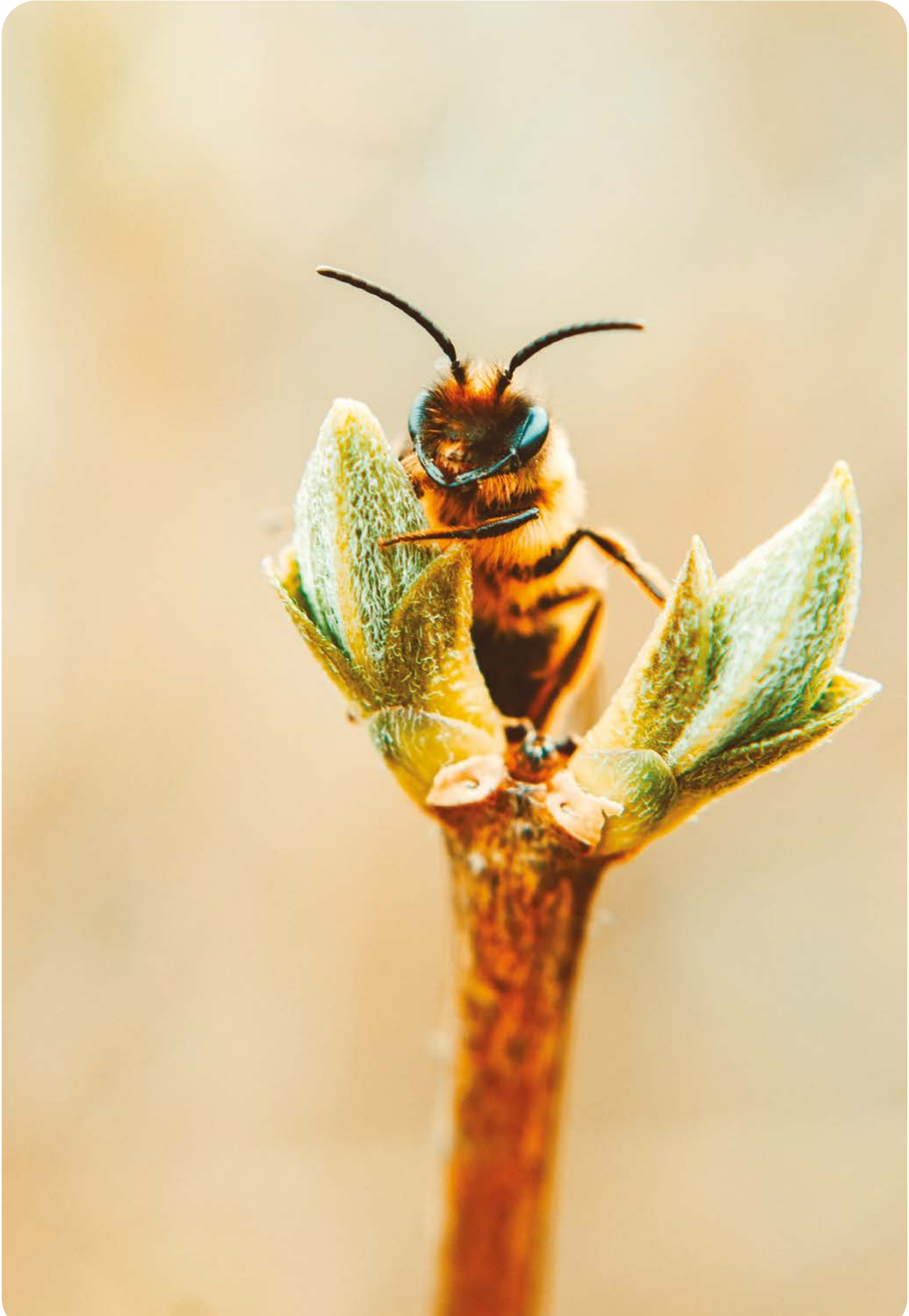
a. Indicator 1: proportion of urban natural spaces (maximum score > 20%)

b. Indicator 10: regulation of water quantity through the measurement of permeable surfaces (maximum score > 60%)

c. Indicator 11: regulation of the climate through measurement of the surface area covered by the canopy (maximum score > 55%)

d. Indicator 12: recreational services, through calculating the per capita surface area of green and blue spaces (maximum score > 0,9 ha/1000 inhabitant).

With regard to equal access to green and blue spaces, the current indicator only deals with the aspect of free or paid access. However, many works on environmental justice in urban areas address the ability of inhabitants to move towards a green and blue space, considering possible physical and psychological obstacles. Although the latter are difficult to measure globally, for the physical aspects and on the basis of the work of Biernacka and Kronenberg (2018), we could envisage the integration into the monitoring framework of the percentage of the urban population living less than 500 m from a green or blue space (at European level, Urban Atlas data may supply this information). The *City Biodiversity Index* mentions the distance of 400 m as a basis for calculation (maximum score: 90% to 100% of inhabitants live at 400 m or less from a green or blue space = indicator 13). However, to express the level of accessibility, this data must be combined with an assessment of two additional criteria: freedom of access and access free of charge.



Strategic Goal C

Equitable sharing - Ensure fair and equitable access to natural resources

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.

Milestone C.1
The share of monetary benefits received by providers, including holders of traditional knowledge, has increased.

Milestone C.2
Non-monetary benefits, such as the participation of providers, including holders of traditional knowledge, in research and development, has increased.

Indicators:
C.0.1 Monetary benefits received from utilization of genetic resources as a result of an ABS agreement, including traditional knowledge.

C.0.2 Number of research and development products from an ABS agreement.

Strategic Goal

Relevance: average

This strategic goal overlaps perfectly with the third strategic goal of the Convention on Biological Diversity. However, its wording or the indicators should refer to the Nagoya Protocol. The wording of the strategic goal implies an increase in monetary benefits: this can only occur on the basis of two factors: i) the existence of benefits, monetary or not; (ii) increased instances of genetic resource use resulting in benefit-sharing. These two parameters depend on the contractual relationships between owners and users of genetic resources and negotiations on this aspect are difficult, even conflicting.

Indicators

Relevance: low

The proposed indicators do not take up the principle stated in the wording of the Strategic Goal, namely that this funding benefits actions in favour of the conservation and sustainable use of biodiversity.

As it stands, it is not certain that the increase in the amounts targeted by indicators C.0.1 and C.0.2 will be beneficial for biodiversity.

Thus, indicators should focus only on where benefits exist and can be shared. What seems important here is to respect access and benefit-sharing measures in cases where they apply, and it therefore seems more logical to monitor the proportion of cases where these measures have been implemented.

It would therefore be preferable to change the wording as follows:

C.0.1: Proportion of cases of genetic resource use that include monetary benefits received by providers, including traditional knowledge owners.

C.0.2: Proportion of cases of genetic resource use that include non-monetary benefits, such as the participation of providers, including traditional knowledge owners, in research and development.

These indicators thus make it possible to monitor the effective implementation of access and benefit-sharing measures and not the increase in the use of genetic resources.

While it is logical to assess the benefits of access and benefit-sharing (ABS) for providers of genetic resources, especially local populations and Southern countries, it is also necessary to assess the benefits of ABS for the conservation and sustainable use of biodiversity. It is indeed an expectation of the CBD that the ABS ultimately contributes to its first two objectives. It would be necessary to consider how multilateral mechanisms at different scales (projects, regions, etc.), which are compatible with the protocol, could facilitate the implementation of projects targeting the conservation and sustainable use of biodiversity and an increase in the effectiveness of ABS.

The proliferation of bilateral ABS contracts is a logical consequence of the implementation of the Nagoya Protocol. The transaction cost for Western research is significant at this stage. Some believe that this cost could undermine the expected benefits of ABS.

Indicator C.0.1 on monetary benefits requires an assessment not currently available. These benefits are probably small, but an assessment would make it possible to re-evaluate the excessive expectations as to the financial profitability of the ABS mechanism. This would, however, create a risk as to the Protocol's credibility whilst, conversely, underlining the relevance of other expectations (the rights of indigenous peoples). In the ABSCH (ABS Clearinghouse) database, the sums involved in the contracts that gave rise to financial benefits are generally confidential and reflect access costs rather than the shared benefits (the contract having been signed before the actual results of the research and development use were known). Moreover, the database does not reflect the non-monetary benefits mentioned in the strategic goal: capacity building, construction of infrastructure, support for value chains, etc. The problem is that the forms of non-monetary sharing are diverse and cannot be summarized into a single indicator.

In its current form, indicator C.0.2 does not seem to be immediately operational: 1) it is difficult to measure the "number of research results" 2) the publications are not currently referenced as to their relationship with an ABS agreement. An indicator on the effective use of co-benefits for the conservation and sustainable use of biodiversity is needed, for example: "the number of projects for the conservation and sustainable use of biodiversity receiving support from the fair and equitable sharing of benefits arising from the use of genetic resources".

Strategic Goal C has only one target for action in the proposed framework (see target 13).

Target 13

Access and fair and equitable benefit sharing

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.

Indicator:
13.0.1 Indicators of operational legislative, administrative or policy frameworks which ensure fair and equitable sharing of benefits, including those based on prior, informed consent (PIC) and mutually agreed terms (MAT).

Target

Relevance: good

It should, however, be noted that the global framework could propose extension of the ABS mechanism to other dimensions of biodiversity: notably biomass (including crop-related biomass) and ecosystem services).

The target could be the drivers of equal access to biodiversity and its services to humans locally, nationally, or internationally: monopoly of land, monopoly of biomass, world nutrient flows, monopoly of fishing resources …

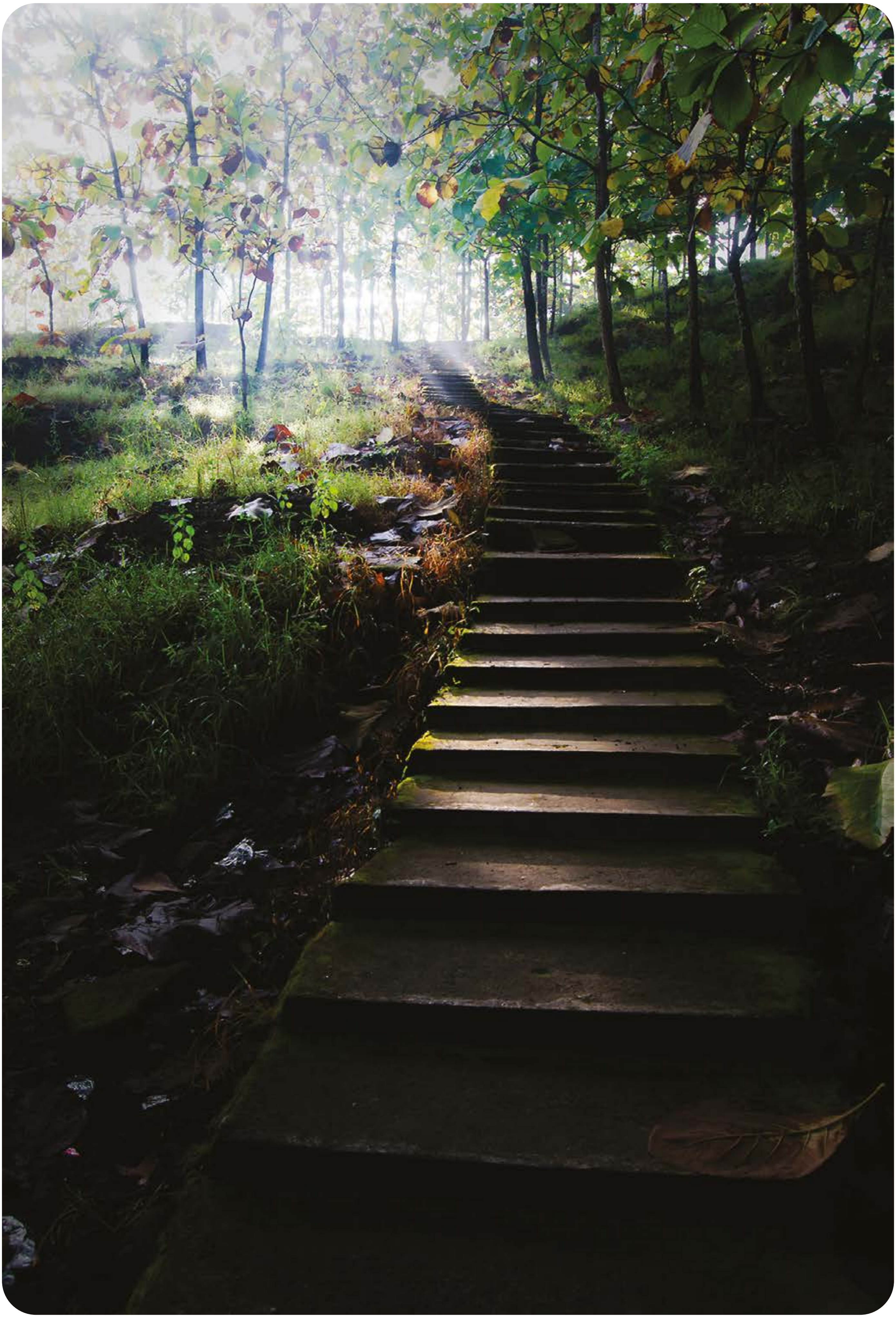
Indicator

Relevance: low

The proposed indicator is not very clear and only seems to be linked to the existence of a legal framework which, although it is a primary necessity, gives absolutely no guarantee that these prescriptions will actually be implemented.

In addition, the purpose of the ABS system is also to provide conservation means for this biodiversity in situ in return for its use. This fundamental aspect is lacking here.

As indicated for Strategic Goal C, an indicator is required on the effective use of the shared benefits for biodiversity conservation and its sustainable use, for example: “the number of projects for the conservation and sustainable use of the biodiversity benefiting from support resulting from fair and equitable sharing of the benefits of the use of genetic resources”, whether this is at the level of Strategic Goal C or of its related target 13.



Strategic Goal D

Implementation – Deploy sustainable tools and solutions

The gap between available financial and other means of implementation, and those necessary to achieve the 2050 Vision, is closed.

Milestone D.1
Adequate financial resources to implement the framework are available and deployed, progressively closing the financing gap up to at least US $700 billion per year by 2030.

Milestone D.2
Adequate other means, including capacity-building and development, technical and scientific cooperation and technology transfer to implement the framework to 2030 are available and deployed.

Milestone D.3
Adequate financial and other resources for the period 2030 to 2040 are planned or committed by 2030.

Indicators:
D.0.1 : Funding for implementation of the global biodiversity framework.

D.0.2 : Indicator on national biodiversity planning processes and means of implementation*.

Strategic Goal
Relevance: good

Indicators
Relevance: good

It could be useful to specify: "for all sectors" in indicator D.0.2, so that the link with target 14 is stronger.

This strategic goal notably covers the indirect biodiversity loss drivers identified by IPBES, related to socio-economic, demographic, technological innovation, cultural and governance aspects.

Target 14

Political mainstreaming

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.

Indicators

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*.

14.0.2 Integration of biodiversity into national accounting and reporting systems, defined as implementation of the System of Environmental-Economic Accounting.

Target

Relevance: good

Indicators

Relevance: low

Indicator 14.0.1 is not precise enough for a qualitative assessment of the level of integration of biodiversity in all economic sectors. Nor does it make it possible to measure the effects of the integration of biodiversity on its state *in situ*.

There is growing evidence that economic growth contributes to biodiversity loss through greater resource consumption and higher emissions of greenhouse gases and pollutants (Otero *et al.* 2020). To make this economic "growth" sustainable, it must be decorrelated from the consumption of resources (nature's material contributions to people) and from the increase in emissions, which threatens the very pursuit of this growth. The full integration of biodiversity values in all sectors, which is the focus of this target, would initiate this transformational change as highlighted by the IPBES in the 2019 global report (FRB 2021).

Most sectors whose activities enable human development, are based on biodiversity (see figure 4 below). Sectoral integration is, in any case, crucial:

a. when reaching the objective of sustainable development depends on functional biodiversity;

b. when the objective of sustainable development involves compromise with the preservation of biodiversity, to limit asymmetrical progress between the objectives.

A semantic modification could contribute to the paradigm shift: rather than seeking to integrate biodiversity into human activities, it would seem more interesting to ask the opposite question, namely "how may we integrate human activities into biodiversity?". Integration here would consist of seeing how the activities of the different sectors may be correctly positioned in policies for the conservation and sustainable use of biodiversity, rather than seeing how biodiversity fits into other sectors. This would make it possible to start from a basis of sustainability (biodiversity) and to see how activities can be deployed within this framework of sustainability, rather than seeing how sustainability could be imposed on activities that are mostly unsustainable. Sectoral integration would therefore be defined here as "the integration of all sectors of the economy at all levels of decision-making into the values of biodiversity". This reversal could represent a transformative change, offering a new paradigm for businesses and lifestyles.

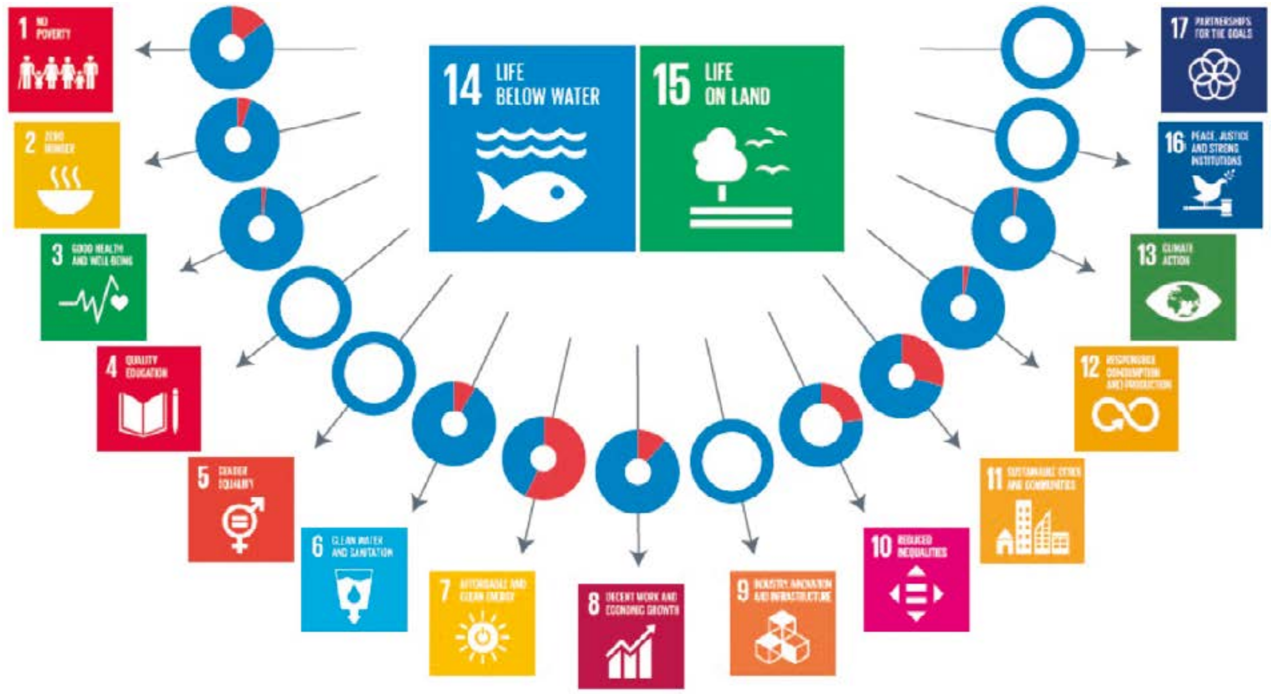


FIGURE 4 : CONTRIBUTIONS OF TERRESTRIAL (SDG 15) AND MARINE (SDG 14) LIFE TO THE ACHIEVEMENT OF THE OTHER SDGS. THE THICKNESS OF THE CIRCLES INDICATES THE AVAILABILITY OF DATA OR THE LEVEL OF INTERACTION BETWEEN THESE TWO SDGS AND THE OTHERS. BLUE INDICATES CO-BENEFITS BETWEEN THESE SDGS, AND RED INDICATES TRADE-OFFS (OBRECHT *ET AL.* 2021).

An "avoid, reduce, compensate" type of approach may represent an operational pathway for this integration of our activities in biodiversity, as proposed by Milner-Gulland *et al.* (2021) for the post-2020 framework. Monitoring the impacts of the many sectors that rely on some form of land use can be achieved through the assessment of their ecological footprint. For example, Beyer and Manica (2021) use datasets at global and national level to assess the ecological footprint of crops and grasslands, based on measurement of their current biodiversity (specific richness, threatened species richness, rarity of the distribution area) on the exploited surfaces, compared with the biodiversity present on an equivalent natural surface.

A qualitative assessment could also be made by referring to the national reports submitted by the States to the CBD to measure the way in which the plans, programmes and strategies of the sectors take biodiversity into account, in particular the following sectors identified by IPBES: agriculture; forestry; fishing; mining and industrial activities; services (health, education and research, transport, tourism, finance) (IPBES, 2018). Following the logic of Milner-Gulland *et al.* (2021), would mean assessing the integration of the avoid-reduce-compensate sequence in the sector strategies, each of them with the goal of zero net biodiversity loss. This framework is applicable to all levels of governance, from the State down to citizens, including businesses and local governments.

Target 15

Mainstreaming in businesses

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.

Indicator:
15.0.1 Dependencies and impacts of businesses on biodiversity.

Target

Relevance: average

The principle of integrating biodiversity into business value chains is fundamental. However, the notion of the progressive reduction of negative impacts presents a risk that these sectors will resort to optimizing their production methods and value chains leading to marginal progress and above all to turning away from or slowing down the transformation which they must undergo. This notion of progressiveness should be compared with the notion of transformational change and the shared observation of the urgent need for action.

Indicator

Relevance: low

No index exists for monitoring these indicators and providing a satisfactory overview of progress towards target 15.

The major economic sectors are strongly linked to the pressure drivers for biodiversity loss, as identified by IPBES, and for which transformative changes are expected. A gradual reduction, if it lacks ambition and speed, does not seem consistent with the urgency of the action recognized and called for by the States that are Parties to the CBD. It also seems little in line with the transformative changes without which the world of economics will not be able to achieve sustainability (see target 14 above).

Measurement of the impacts and dependencies of the business world on biodiversity is complex. Beyond the multitude of state indicators, there are still no aggregated or integrative indicators likely to meet the expectations of most major industrial sectors and States to measure the impacts of human activities on biodiversity and environments, and to monitor the progress of actions taken to reduce them. The FRB studies (2021a) have made it possible to assess seven aggregate indicators, some of which are very promising, but all of which fail to take into account one or more pressures on biodiversity. IPBES will examine the methodologies for measuring the impact and dependence of companies on biodiversity in a report planned for 2025. It is essential that, by then, indicators can be used to monitor the implementation of the post-2020 global framework. At present, "life cycle analysis"-type approaches integrating biodiversity would make improved mainstreaming of this issue in business areas possible (FRB 2021b) (Finkbeiner *et al.* 2014, Teillard *et al.* 2016, Woods *et al.* 2016, Winter *et al.* 2017, Lindner *et al.* 2019, Myllyviita *et al.* 2019, Vradonk *et al.* 2019, Marques *et al.* 2021) but the functional and population-related effects of biodiversity still need to be developed (Souza *et al.* 2015). This integration may lead to conclusions that are very different from life cycle analyses that do not integrate biodiversity (Chaplin-Kramer *et al.* 2017). Pooling the efforts of research communities studying life cycle analyses with those focusing on conservation would thus make it possible to improve the integration of biodiversity in these methods. (Marques *et al.* 2017, Maier *et al.* 2019).

More precise indicators than the one proposed in 15.0.1 would make it possible to measure the progress of companies in integrating and limiting the impacts of their activities on biodiversity:

a. existence of environmental accounting in the business;

b. integration of biodiversity in business environmental reporting.

Examples do exist of initiatives that measure these aspects, like the *KPMG Survey of Sustainability Reporting*, which assesses the proportion of businesses that take into account the risks associated with biodiversity loss in their reporting, by adopting a sectoral approach. However, it is becoming essential to assess the effectiveness of these accounts and reports on the decisions and governance of businesses.

Target 16

Mainstreaming by citizen

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.

Indicators:
16.0.1 Food waste index.

16.0.2 Material footprint per capita.

Target

Relevance: good

Indicators

Relevance: good

It may be interesting to have other indicators to complement 16.0.2.

Recent work illustrates the "place" occupied by the human species, and its productions, in relation to the rest of the biosphere. The mass of matter associated with humans (or "anthropogenic mass" such as plastics or buildings and other infrastructures) exceeds the total biomass of living beings on the planet (Elhacham *et al.* 2020). Similarly, Bar-On *et al.* (2018) show that human biomass and that of domestic animals exceed the biomasses of other land vertebrates. This collapse in the biomass of wild mammals is due to the reduction of the wild populations caused by humans, which applies notably to mammals and birds, either by direct removal, or mainly by destruction of wild habitats (see Table 3 below). An indicator based on monitoring the biomass of these species can also inform target 4. An increase in the biomass of groups of wild species will illustrate a recovery of populations and, a priori, of their genetic diversity.

The indicators proposed in 16.0.1 and 16.0.2 are relevant: the loss of biodiversity is not only linked to human consumption, but these impacts can also be exported. 33 % and 26 % of the impacts in Central and Latin America and Africa, respectively, are caused by consumer practices in other parts of the world (Marques *et al.* 2019). International trade is responsible for 30 % of threats to species (Lenzen *et al.* 2012) (reflected in indicator 16.0.2). Other studies estimate that through continued sustainable intensification and trade, reduced food waste (reflected in indicator 16.0.1) and more plant-based human diets, more than two-thirds of future biodiversity losses could be avoided and trends in biodiversity loss linked to habitat conversion could be reversed by 2050 for almost all models (Leclère *et al.* 2020).

Another indicator providing insights on these aspects, in a similar way to the per capita material footprint, is the ecological footprint compared with the States' biocapacity (i.e. their capacity to produce biomass on their national territory). This indicator, prepared by the *Global Footprint Network*, was used in the IPBES assessment report on biodiversity and ecosystem services in Europe and Central Asia (2018) to reveal the impacts on biodiversity beyond their boundaries: States whose per capita ecological footprint exceeds biocapacity are *de facto* in deficit and therefore alter the natural capital of other states.

Groups	Currently	Before anthropic extinction
Humans	60	
Animals (cattle, pigs)	100	
Wild mammals	7 (including 3 land-based and 4 marine)	40
Domesticated birds	5	
Wild birds	2	
Arthropods	1000	
Fish	700	800
Total animals	2000	

TABLE 3 : GLOBAL BIOMASS FIGURES (IN CARBON MEGATONS) OF DIFFERENT ORGANISMS, CURRENTLY AND BEFORE ANTHROPIZED EXTINCTION (BAR-ON, 2018)

With regard to the dimension of "encouraging" people to make responsible choices, the indicators proposed for target 18 may be beneficial. Harmful subsidies create price distortions that influence consumer choices through offering less expensive products (because they do not include environmental externalities), but with a higher impact on biodiversity, or on other sustainable development goals, such as human health, clean purified water, and climate change.

Target 17

Biotechnologies

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.

Indicator:
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*.

Target

Relevance: average

The best prevention against the risks of these technologies (which are concerned by an entirely dedicated protocol under the egis of the CBD, namely the Cartagena Protocol) lies in the first step of the avoid-reduce-compensate sequence, namely avoiding the use of these solutions as much as possible. In general, these technologies can have a locking effect that goes against the notion of transformative change: biotechnology aims to find solutions in fundamentally unsustainable systems, and this can "lead us headlong down a blind alley" if it is not deployed within an appropriate environmental, ethical and economic framework.

A more satisfactory rewording of the target would be: "Establish measures, build capacity in this area and implement them in all countries to avoid the use of biotechnologies or, where appropriate, to prevent, manage or control the potential negative effects of biotechnologies on biodiversity and human health, reducing the risk of these effects."

Indicator

Relevance: average

An informative indicator could be the percentage of research funding for biotechnologies, compared with research on nature-based approaches, for example agroecology.

This target is linked to targets 10 (agriculture), 15 (production) and 16 (consumption), because biotechnologies are used in productive systems. Biotechnological solutions essentially involve genetically modified organisms (GMOs). A first remark could be that the target would benefit from being extended to all technologies with the aim of questioning their harmlessness for biodiversity, ecosystems, and the services that humans derive from them, notably with a view to a massive deployment of these solutions.

GMOs are used in agriculture in the context of intensive crop-growing systems for which they aim to improve a dimension of agricultural practices (herbicide or insecticide in more than 90% of the areas cultivated with genetically modified plants, see Royal Society, 2015), probably to simplify practices, but without environmental improvement, and even more so without rethinking the intensive model which is fundamentally unsustainable (use of soil, water, etc.). Consideration should be given to the advisability of proposing a replacement target for biotechnological solutions by ecosystem-based approaches, in particular for the benefit of agroecology. Agricultural GMOs, through their effect of simplifying agrarian systems, can in fact have a locking effect on intensive agriculture and could limit the possibilities of transforming systems called for by IPBES. The need for biotechnology in agriculture for food security often appears to reflect private interests rather than being based on scientific arguments (Jacobsen *et al.* 2013) and raises questions about the orientation of research funding between biotechnological solutions and those based on agrobiodiversity, or about the political choices on these different solutions (Jacobsen *et al.* 2015). In addition, studies on plants that have been genetically modified to be resistant to herbicides or to produce insecticides show that their use in agriculture not only does not significantly improve yields, but can lead to an increased use of phytopharmaceuticals. (Benbrook 2012, Bonny 2015), products which represent a risk to biodiversity (Agostini *et al.* 2020) which is contrary to targets 7 and 10 in particular.

The risk of genetic pollution from these biotechnologies is linked to target 3 on the protection of species. Biotechnologies also lead to the appearance of resistance among the weed species (Bonny 2015) or insects (Dively *et al.* 2016) which were initially targeted by this type of strategy, rendering them inoperative.

These technologies also present risks in terms of intellectual property and access and benefit-sharing issues (target 13). The economic risks are notably linked to the appropriation of living things, the challenge here being to allow biotechnological innovation without appropriation. (Amini *et al.* 2014). Regarding the access and benefit-sharing addressed by the Nagoya Protocol, the process has, in principle, been set up to avoid abuses, except on the issue of digital sequencing information which, to date, does not fall within the scope of the protocol. However, we have not identified any known example of effective application of the Nagoya Protocol for the sharing of benefits from the GMO industry with indigenous and local populations who may have contributed to the selection of genetic traits later used in the agro-industrial sector.

Target 18

Harmful subsidies

Redirect, repurpose, reform or eliminate incentives harmful for biodiversity, in a just and equitable way, reducing them by at least US$ 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 positive or neutral for biodiversity.

Indicator:
18.0.1 Value of subsidies and other incentives harmful to biodiversity, that are redirected, repurposed or eliminated.

Target

Relevance: good

Redirecting, reallocating or reforming harmful incentives involves removing support for activities with a negative impact on biodiversity and taking action against a major indirect pressure. Ideally, this target should be linked to the redirection of the funds thus saved towards activities that are beneficial or at least neutral for biodiversity.

The estimated figure of 500 billion US dollars is consistent with the studies, but it is indeed a minimum, since the total of harmful subsidies is often estimated at more than 1.000 billion US dollars, or even several trillion if the cost of the externalities is taken into account.

Indicator

Relevance: good

An additional indicator could address the principle of eco-conditionality, such as: the number of countries that have set up ad hoc regulations on public aid that include a mechanism for monitoring the commitments of recipients. This indicator would be provided by the States as part of their national reports to the CBD.

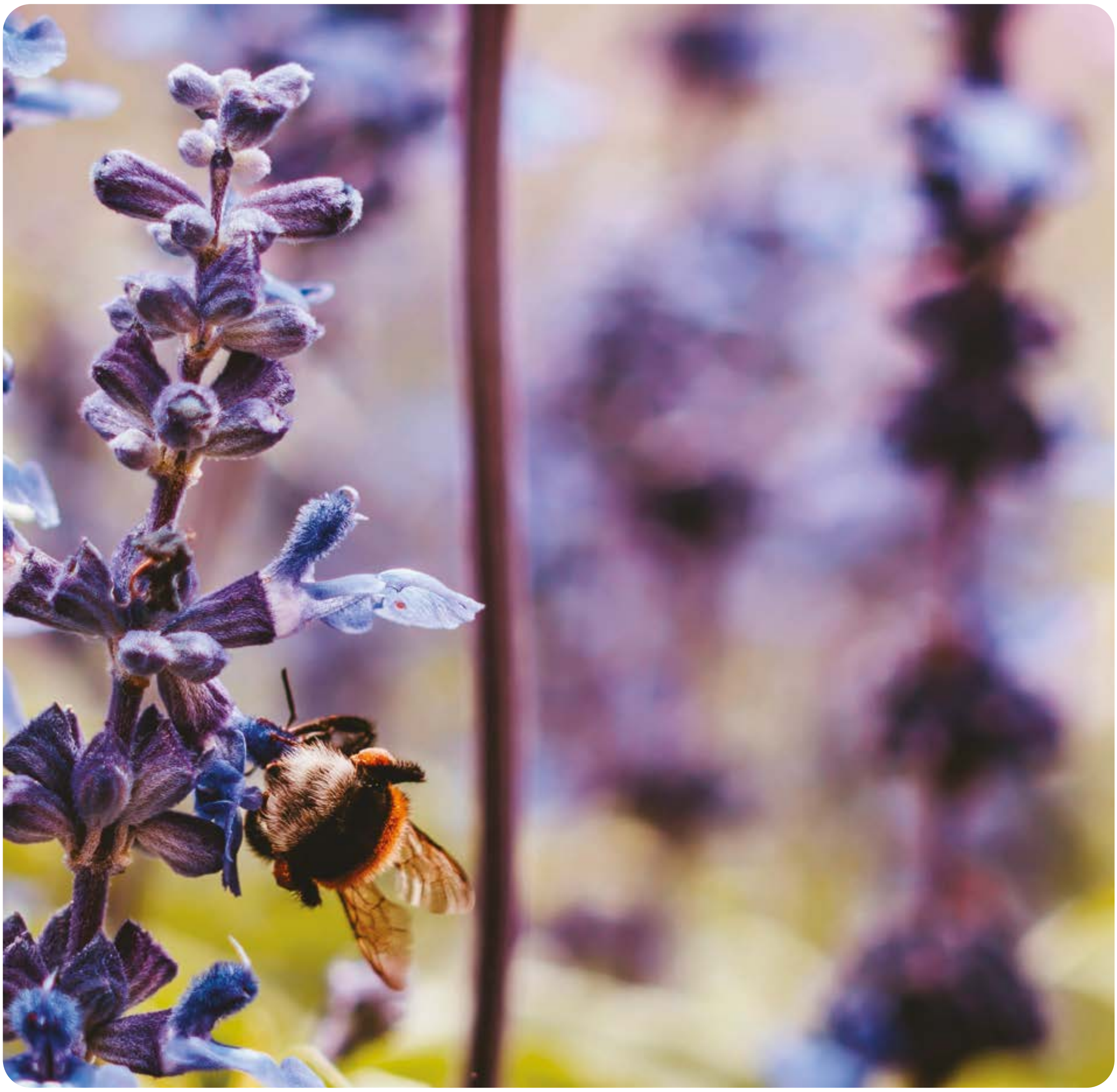
This target is perhaps the most fundamental to the success of the future framework, as it underpins most of the pressures on biodiversity. Without reaching this target, the strategy cannot be implemented, or else at a much higher cost, and will be much less efficient, with deadlines that are too late in relation to the urgency of the situation. Currently, many policies, particularly financial ones, have strong impacts on biodiversity (Mallory 2016, Sumaila *et al.* 2019, Lakner *et al.* 2021) and very few countries have identified their public subsidies which are harmful to it.

Even fewer have engaged in reforming this type of subsidy (Dempsey *et al.* 2020). Faced with the observation of rapid loss of biodiversity and the services that the human species derives from it, it is essential to reform those policies which jeopardize sustainability, which is a *sine qua non* condition for the survival of the human species on Earth (see Yang *et al.* 2021). To do this, it is necessary to redefine the “growth” criteria that motivate the existence of current harmful subsidies, because as long as it is linked to the consumption of resources and emissions, it will lead to biodiversity loss. (Otero *et al.* 2020).

In 2019, subsidies to biodiversity-destroying activities were estimated at 500 billion (OCDE 2020) to 1000 billion US dollars (AFD 2019), far exceeding those dedicated to its protection (Deutz et al. 2020). The OECD points out that taking into account environmental externalities, the figure for harmful subsidies could reach 4 to 6 trillion US dollars per year. Resistance to the reduction of harmful subsidies seems less and less justified in view of the potential economic opportunities brought by this redirection of funds, notably several hundred million jobs over 10 years. (WEF 2020).

The sectors to be targeted more specifically are those affected by sectoral integration issues (see target 14): fossil fuels (around 340 billion in 2017), intensive agriculture (116 billion for OECD countries in 2017), and intensive fishing (280 million for 27 OECD countries). These are minimum estimates taken from Dasgupta (2020).

Indicator 18.0.1, which should be informed by OECD data on subsidies harmful to biodiversity, provides robust information on progress on this target. The OECD notably includes the assessment of incentive conditionality criteria and the negative or positive impact of these criteria on biodiversity. The notion of eco-conditionality linked to the conservation of biodiversity must apply to all levels of funding involving public aid and grants, including for regional or national aid policies, the international trade framework, development aid or grants from local authorities (Levrel (coord.), 2020).



Target 19

Resource mobilization

Increase financial resources from all sources to at least US$ 200 billion per year, including new, additional and effective financial resources, increasing by at least US$ 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 implementation, commensurate with the ambition of the goals and targets of the framework.

Indicators

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.

Target

Relevance: average

The ambition to mobilize 200 billion US dollars per year is not enough based on the estimates provided by the literature, which are around 850 billion US dollars.

Indicators

Relevance: average

The aspect of capacity building, technology transfer and scientific cooperation would merit a dedicated indicator, since it is underlined in the target, although it could be included in the proposed indicators.

Relevant indicators on this point could be proposed:

- percentage of international research projects on biodiversity led by institutions in developing countries;
- research funding in and for developing countries;
- bibliometric index on the publications of researchers from developing countries.

This target has strong links with targets 14 and 18 on several aspects:

a. integrating biodiversity values into the different sectors and policies (target 14) can greatly contribute to "[increasing] financial resources from all sources";

b. the success of target 17 is a pre-requisite, as even more resources will have to be mobilized under target 18 to counter the negative effects of harmful subsidies;

c. the removal of harmful subsidies under target 18 would free up financial resources that could be redirected for biodiversity conservation and thus contribute to target 19.

The ambition to mobilize 200 billion US dollars per year remains far below the estimated needs. For example, recent reports (Deutz *et al.* 2020, Dasgupta 2020, OCDE 2020) estimate that the overall amount allocated to biodiversity conservation in 2019 was approximately 68 to 150 billion US dollars per year, while the budget required would actually be around 850 billion to more than 1000 billion US dollars per year. We propose to reword the target by updating the figures, namely: "to reach a figure of at least 800 billion US dollars per year". According to the scenarios, the costs of action are much lower than the costs of inaction. Highlighting this reinforces the argument in favour of an ambitious objective for this target. (Deutz *et al.* 2020).

It would have been interesting to give an indication of a national GDP rate to be mobilized for biodiversity. Using the above estimates of current funding compared with those deemed necessary, approximately 1.2% of global GDP should be mobilized for biodiversity conservation. This figure could serve as an indication for the mobilization of 1.2% of the national GDP of each State to be dedicated to the conservation of biodiversity. This would put countries on an equal footing. Indeed, a study of country profiles shows that rich countries invest more public money in biodiversity than poor countries, but that this represents a smaller share of their gross domestic product. (Seidl *et al.* 2021). The target would therefore be reworded as follows: "to ensure they amount to at least 1.2% of national GDP". Furthermore, development aid and the mobilization of financial resources in developed countries to support conservation in developing countries, clearly identified in the target, remain relevant. (Mikkelson *et al.* 2007). As the GDP of developing states is lower, and their overall biodiversity richer, the target of 1.2% of GDP dedicated to biodiversity conservation would probably not be sufficient.

Faced with the risk of blocking negotiations on the question of access and benefit-sharing (ABS) and on digital sequence information for the financing of the global framework, it should be remembered that ABS is above all an integral part of the sustainable use of biodiversity and is an end in itself. It should not be misinterpreted as a primary funding mechanism for global resource mobilization. Yet the failure of the international community so far to set aside the resources needed to preserve biodiversity has contributed to fuelling unrealistic expectations about the monetary benefits that should be generated by ABS agreements. The very nature of ABS means that it cannot and should only partially contribute to the financial resources needed to achieve the long-term goals of the global framework (Sara *et al.* 2021).

Target 20

Knowledge

Ensure that relevant knowledge, including the traditional knowledge, innovations and practices of indigenous peoples 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.

Indicator:
20.0.1 Indicator on biodiversity information and monitoring, including traditional knowledge, for management*.

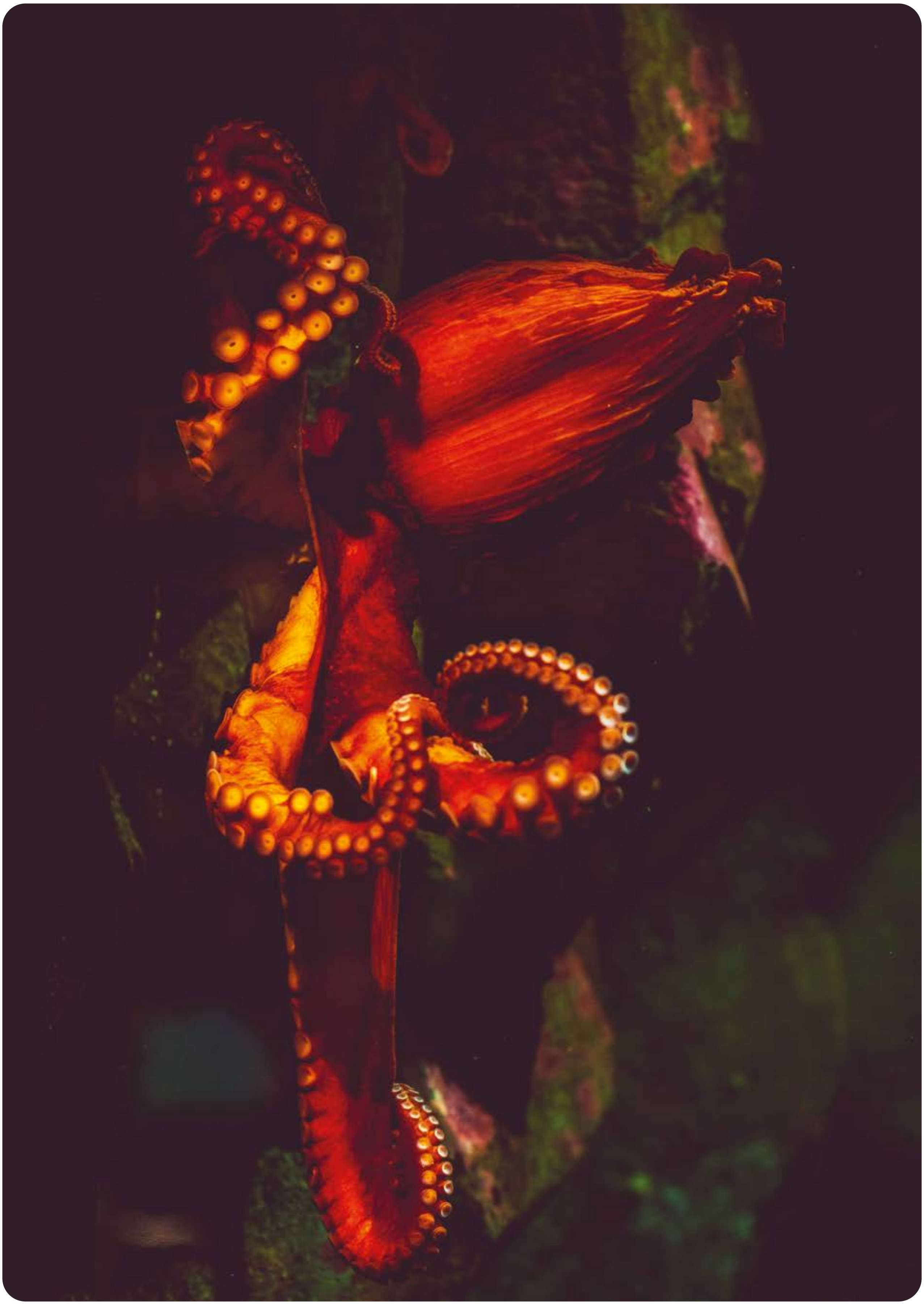
Target
Relevance: good

Indicator
Relevance: average

There should also be a means indicator reflecting the budget devoted to these three essential areas of awareness-raising, education, and research on biodiversity.

Local knowledge is crucial and the most likely to participate in the implementation of measures and strategies adapted to the specific characteristics of the different territories. It makes it possible to adopt relevant and sustainable socio-ecological approaches to planning (target 1) and management of territories for biodiversity. It can also contribute significantly to the monitoring of biodiversity.

The objective of improving knowledge should not be a pretext for postponing action until all the necessary information is available. Observations of the current loss of biodiversity can no longer be questioned, the pressure drivers are now well identified, and the solutions are in the hands of decision-makers and civil society. Science and local and traditional empirical knowledge can support the implementation of these solutions.



Target 21

Equitable participation and human rights

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.

Indicators:
21.0.1 Land tenure in the traditional territories of indigenous peoples and local communities*.

21.0.2 Degree to which indigenous peoples and local communities, women and girls as well as youth participate in decision-making related to biodiversity.

Target

Relevance: good

It has been perfectly demonstrated that inclusive governance facilitates better acceptance and better joint construction of measures that are applied locally. It would be interesting to envisage a way of involving representatives of non-humans in decision-making, for example via the intermediary of indigenous peoples and local communities who are the most familiar with them or, if there are none available, environmental NGOs.

Indicator

Relevance: good

Indicator 21.0.1 is relevant. It could be complemented by mentioning non-humans.

Indicator 21.0.2 well reflects one aspect of the problem, which is the monopolizing of land to the detriment of indigenous local communities whose financial power is not comparable with that of governments or large private companies that exploit and make a profit from living beings. Giving their rights back to local communities is indispensable, especially in terms of land ownership rights (Fernández-Llamazares *et al.* 2021; Cariño and Farhan Ferrari, 2021). Knowledge of property law in the different countries is a good start, which could be completed by assessment of their efficiency in conserving property rights for these populations.

Robin Goffaux, Agnès Hallosserie (2020)
The post-2020 Global biodiversity framework -
Analysis of the draft framework by FRB
Coll. Expertise and synthesis. Paris, France : FRB, 80 pages.

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Highlight of the 15th Conference of the parties (COP 15) to the Convention on Biological Diversity, the post-2020 global biodiversity framework comes after the Aichi Biodiversity Targets (2010-2020). The content of the Aichi Targets was broadly relevant to address biodiversity loss, but their implementation largely failed. This was due in particular to the lack of a monitoring and reporting system applying to the States Parties to the Convention, as well as the lack of resources allocated. The new post-2020 strategy aims to avoid these pitfalls and its long preparation process (almost three years, due to the Covid-19 pandemic) focuses on these implementation aspects.

The French Foundation for Biodiversity Research (FRB), providing scientific and technical support to French decision-makers and stakeholders, has conducted a critical review of the draft framework (version of July 2021) before its consideration by the Conference of the parties. Identifying the relevant knowledge from the research community, this work analyses the wording, rationale and indicators associated with the four strategic goals, the 21 action targets and associated indicators that constitute the draft global framework. This report offers insights to help negotiators in the process towards COP 15.

FRB's mission is to promote research activities on biodiversity together with stakeholders. Stimulating innovation, developing and supporting projects, disseminating knowledge and mobilizing expertise are its main action areas.

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