Guidelines and template for the review of the draft monitoring framework for the post-2020 global biodiversity framework

I. Background

1. The second meeting of the Open-ended Working Group[1] on the Post-2020 Global Biodiversity Framework invited the Subsidiary Body on Scientific, Technical and Technological Advice at its twenty-fourth meeting to, among other things, carry out a scientific and technical review of the updated goals and targets, and related indicators and baselines, of the draft global biodiversity framework. Under agenda item 3 the Subsidiary Body will consider this issue.

2. Tables 1 and 2, presents a draft monitoring framework for the 2050 Goals and the 2030 targets respectively. These tables are being made available for the purposes of peer review. In both tables' interim formulations of the proposed 2050 goals and milestones and the 2030 targets are provided for context. Review comments are not being sought on these parts of the post-2020 global biodiversity framework at this time. Column A of the tables provides draft components of the goals and targets. Columns B and C of the tables provide draft monitoring elements and indicators to be used at the global level to monitor progress in the implementation of the post-2020 global biodiversity framework. Further column D provides information on the period baseline data is available for the indicator and on the frequency that the indicator is updated where known. Review comments are being sought on columns A, B, C and D only.

II. Submitting Comments

1. To ensure that your comments are given due consideration, please send them by e-mail to secretariat@cbd.int, at your earliest convenience but **no later than 15 August 2020**

2. When submitting comments, please adhere to the following guidelines as much as possible:

   a. Please provide all comments in writing and in an MS Word or similar document format using the table provided below.

   b. Please provide full contact information for the individual/Government/organization submitting the comments.

   c. Please avoid commenting on issues related to grammar, spelling, or punctuation, unless it affects the overall meaning of the text, as the document will be edited as the final draft is prepared.

   d. To facilitate the revision process please be as specific as possible in your comments. In areas where you feel additional or alternative text or information is required, please suggest, if possible, what this text may look like or what should be included.

   e. If you refer to additional sources of information, please include these with your comments when possible or provide a complete reference or hyperlink.

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[1] CBD/WG2020/REC/2/1

f. Please focus your comments on columns A (components the draft goals and targets), B (monitoring elements), C (indicators) and D (indicator baseline year and frequency of updates) of tables 1 and 2.

g. If you are suggestion the inclusion of additional indicators please provide information on if the indicator is currently operational, the organization supporting its development, its baseline (i.e. the year data is first available) and how frequently the indicator is updated (i.e. monthly, yearly, every two years etc.).

h. All review comments will be posted on the webpage[2] for the post-2020 global biodiversity framework in the interests of transparency

3. Should you have any questions regarding the review process, please contact secretariat@cbd.int.

III. Template for Comments

4. Please use the review template below when providing comments.

5. The complete draft of the monitoring framework has been released in a portable document format (PDF). For tables 1, 2 and 3 column letters and row numbers have been provided as well as page numbers. Please use these as a reference as illustrated in the table below. General comments can be included in the table by referring to Page 0 and Line 0.

TEMPLATE FOR COMMENTS

Review comments on the draft monitoring framework for the post-2020 global biodiversity framework	
Contact information	
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General Comments	
On behalf of the Pesticide Action Network North America, I am pleased to submit the following comments.	
PAN North America (PANNA) is a member of the PAN International network.	
Pesticide Action Network fully endorses the Open Letter sent to the CBD recently by the CBD Alliance, the Women's Caucus and the Global Youth Biodiversity Network (GYBN). We join these civil society networks and constituency groups in insisting that the CBD allow continued public comment on goals,	

[2] https://www.cbd.int/conferences/post2020

milestones and targets and postpone any discussion of monitoring elements, indicators and baseline data until after the former have been negotiated and agreed by member states. That we are providing these comments on components, monitoring elements and indicators at this time does in no way indicate that we accept the goals, milestones and targets as given, approved or final.				
PAN International has already provided detailed comments on provides the following preliminary comments on Tables 1 and 2, relating to **Targets 1-6**. PAN North America, as one among the six regional centers of PAN International, fully endorses those collectively prepared and agree-upon comments as well. At this time, we are pleased to provide the following **additional comments on Targets 7-19.**				
Specific Comments				
Table	**Page**	**Column**	**Row**	**Comment**
				Target 7 : "By 2030, increase contributions to climate change mitigation adaptation… from nature-based solutions and ecosystem-based approaches, ensuring resilience"
2	16	0	0	The term "nature-based solutions" in Target 7 should not be used, as it has no established scientific basis. Language in the target should be revised and "nature-based" should be replaced with "agroecological." The transdisciplinary field of agroecology has an established scientific basis of over 80 years, spanning ecology and evolutionary biology, the full range of plant and animal sciences, agricultural sciences and social sciences. In addition, the relevance of the established scientific approaches and principles of agroecology to solving today's pressing biodiversity, climate, water, energy and food system crises have been deepened and expanded through integration and cross-fertilization with local, traditional and Indigenous knowledge and practices. Agroecology has been clearly identified as *the* most robust, transformative approach to food systems change by the High Level Panel of Experts on Food Systems and Nutrition and has become the standard at UN bodies such as the UN Food & Agriculture Organization and UN Committee on Food Security: HLPE, 2019. *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. http://www.fao.org/3/ca5602en/ca5602en.pdf FAO, 2018. Ten elements of agroecology. http://www.fao.org/agroecology/knowledge/10-elements/en/
2	16	A	97	Proposed new component target 7.x: "Increased adoption of agroecological approaches that support climate mitigation and adaptation, biodiversity protection, ecosystem function and services."
2	16	B	97	Proposed new monitoring element: "Trends towards adoption of agroecological

				approaches in food and agricultural systems that support climate mitigation and adaptation, biodiversity protection, ecosystem function and services." Increasingly, high-level panels of experts, intergovernmental and UN bodies, and scientific publications affirm that an agroecological transformation of agricultural systems is the most robust and appropriate response to climate change *and* biodiversity protection, and go well beyond narrow technical or technological fixes (HLPE 2019; Sinclair et al 2019; Andrieu & Kebede, 2020). HLPE, 2019. *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. http://www.fao.org/3/ca5602en/ca5602en.pdf Sinclair, F., Wezel, A., Mbow, C., Chomba, S., Robiglio, V., and Harrison, R. 2019. "The Contribution of Agroecological Approaches to Realizing Climate-Resilient Agriculture." Rotterdam and Washington, DC. https://cdn.gca.org/assets/2019-12/TheContributionsOfAgroecologicalApproaches.pdf Andrieu N, Kebede Y. 2020. Climate Change and Agroecology and case study of CCAFS. CCAFS Working Paper no. 313. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Gliessman, S. 2016. Transforming food systems with agroecology. J Agroecology and Sustainable Food Systems, Vol 40 Issue 3. https://www.tandfonline.com/doi/full/10.1080/21683565.2015.1130765
2	16	C	97++	Indicators to measure progress towards the above proposed component, new Target 7.x should include: • Land area (hectares or percentages) under established *agroecological* production. This will typically translate into highly biodiversified, pesticide-free, soil-biodiversity-conserving, C-sequestering practices that support climate change mitigation and adaptation, climate resilience and ecosystem services (provision of clean water, pollination, natural pest control, maintenance of beneficial soil communities), all of which in turn support disaster risk reduction as well. Data gaps and measurement tools to capture land area under genuine agroecological production will need to be developed, but agroecologists at FAO and at various independent institutions, universities and within agroecological social movements, are available to assist. • Land area under tree-based systems (agroforestry) that initiate an agroecological succession, e.g. "food forests", silvo-pastoral systems and other holistic systems that integrate wild food, medicinals and fungi also reduce disaster risk by supporting a broader range of human health, nutritional, dietary and energy needs. • Land area in *transition* from conventional systems to agroecology, i.e.

				showing progressive, increased agricultural and wild animal and plant diversity, use of vegetation covers, increased complexity in space and time of crop rotations, increased soil organic matter, etc. *For empirical rigour in measuring "land area in transition", we recommend following Gliessman's 5 Levels in the hierarchy of transitions towards agroecology.* We provide Gliessman's descriptions further below. Gliessman, S. 2016. Transforming food systems with agroecology. J Agroecology and Sustainable Food Systems, Vol 40 Issue 3. https://www.tandfonline.com/doi/full/10.1080/21683565.2015.1130765 Data gaps may need to be filled in regions where data are not yet collected. As concluded by the HLPE 2019 report referenced above, and many others, a number of agricultural practices exist that make minor tweaks to dominant, largely unsustainable approaches in agriculture (e.g. climate-smart ag, sustainable intensification, herbicide-based conservation ag). These latter approaches do not provide the holistic, interconnected systems transformation and multiple benefits that agroecology provides (e.g. supporting, protecting and restoring biodiversity, ecosystem services and function, climate-resilience, human health, farm productivity, social and economic resilience, equity and well-being, within planetary boundaries). Therefore, the desired indicator here is data on land under *agroecological* production; these data must be disaggregated from area uptake of climate-smart or SI or similar approaches that do not advance the transformative systems change that is required. Disaggregating data according to Gliessman's 5 levels of transition to agroecology is critical to enabling accurate assessment of progress in the transition towards the desired result (systems change, stabilizing climate, protecting biodiversity), and to ensuring that progress does not stall at the lowest, least meaningful, levels of change (i.e. levels 1 or 2 below). Gliessman, S. 2016. Transforming food systems with agroecology. J Agroecology and Sustainable Food Systems, Vol 40 Issue 3. https://www.tandfonline.com/doi/full/10.1080/21683565.2015.1130765 *Level 1: Increase the efficiency of industrial and conventional practices in order to reduce the use and consumption of costly, scarce, or environmentally damaging inputs*. "Most conventional agricultural research has taken place at this level, through which considerable modern agricultural technologies, inputs, and practices have been developed. This research has helped farmers maintain or increase production through such practices as improved seeds, optimum planting density, more efficient pesticide and fertilizer application, and more precise use of water. So-called "precision agriculture" is a recent focus of research at Level 1. Although this kind of research has reduced some of the negative impacts of industrial agriculture, they do not help break its dependence on external human inputs and monoculture practices." *Level 2: Substitute alternative practices for industrial/conventional inputs and practices.*

				"The goal of this level of transition is to replace external input-intensive and environmentally degrading products and practices with those that are more renewable, based on natural products, and more environmentally sound. Organic farming and biodynamic agriculture are examples of this approach…. However, at this level, the basic agroecosystem is not usually altered from its more simplified form, hence many of the same problems that occur in industrial systems also occur in those with input substitution." *Level 3. Redesign the agroecosystem so that it functions on the basis of a new set of ecological processes*. "At this level, fundamental changes in overall system design eliminate the root causes of many of the problems that continue to persist at Levels 1 and 2. The focus is on prevention of problems before they occur, rather than trying to control them after they happen…. A good example is the reintroduction of diversity in farm structure and management through such actions as ecologically-based rotations, multiple cropping, agroforestry, and the integration of animals with crops." *Level 4. Re-establish a more direct connection between those who grow our food and those who consume it*. "Food system transformation occurs within a cultural and economic context, and this transformation must promote the transition to more sustainable practices." *Level 5. On the foundation created by the sustainable farm-scale agroecosystems achieved at Level 3, and the new relationships of sustainability of Level 4, build a new global food system, based on equity, participation, democracy, and justice, that is not only sustainable but helps restore and protects earth's life support systems upon which we all depend*. By thinking beyond Levels 1–4, Level 5 involves change that is global in scope and reaches beyond the food system to the nature of human culture, civilization, progress, and development. The depth of change is more than mere conversion or transition, and enters into the realm of full reform or transformation. With Level 5 thinking and action, agroecology provides ways to build upon farm-scale and farmer-driven change processes to a full re-thinking of how we all relate to each other and to the earth that supports us. Basic beliefs, values, and ethical systems change. … **The important role that food systems can and must play in mitigating and adapting to climate change as a global issue is one example of the value of Level 5 thinking**.
2	16	C	97++	Additional indicators for measuring progress towards agroecology can be developed in collaboration with agroecologists, drawing – for example – on the criteria developed by FAO (http://www.fao.org/agroecology/knowledge/10-elements/en/). FAO's Ten Elements of Agroecology include diversity, co-creation of knowledge, synergies, efficiency, recycling, resilience, human and social value, culture and food traditions, responsible governance, circular and solidarity economy.
				Target 8
2	19	B		Add: Trends in pollinator species abundance and richness

2	19	C		The EU as part of Common Ag Policy is proposing a pollinator indicator: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0395&from=EN
2	19	C		Indicators to measure insect species richness and abundance could be developed following the methodology provided in Hallman et al. Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12(10): e0185809. https://doi.org/10.1371/journal.pone.0185809
2	19	B		Add: Trends in soil biodiversity (with particular attention to beneficial soil organisms)
2	19	C		Regarding measuring soil biodiversity, tools for "visual" soil biodiversity assessments are available (via Edmundo Barrios, FAO). See also Agrobiodiversity Index (Bioversity International. 2018. The Agrobiodiversity Index: Methodology Report v.1.0. Bioversity International, Rome, Italy)
2	19	C	114	The indicator given here refers to *ex situ* conservation only. In addition, an indicator measuring *in situ* conservation of plant and animal genetic resources (e.g. by Indigenous people and communities, and by farmers and in farmers' fields) is critical and should be added. This may represent a data gap that needs to be addressed.
2	19	B	0	in terms of Target 8.2 "sustainable management" of terrestrial wild species, what is critical is not only the existence of those species but the *knowledge* behind the management of those wild species. This knowledge, and the intergenerational transmission of such knowledge, is at risk – particularly among Indigenous and peasant farming communities, whose lives and rural livelihoods are at extreme risk due to a lethal combination of: climate change, loss of biodiversity, Covid-19, state violence and persecution, loss of customary land rights and access, etc. Therefore we propose these additional monitoring elements: • Trends in land sovereignty, e.g. control over and secure access to land by Indigenous and peasant communities • Trends in intergenerational transmission of knowledge, culture and language by Indigenous and peasant communities Indicators may be available from Indigenous peoples, First Nations, peasant-based social movements like La Via Campesina, and/or other institutional arrangements.
2	20	A	0	Target 9: The language of this target is based on a misunderstanding of agriculture, ecology and productivity. The concept of "productivity gaps" assumes the existence of a measurable gap between a theoretical, idealized productivity level and actual output, for each individual crop. This approach has been developed in monocropping systems which measure single crop production per unit area without regard to true costs (including social and environmental externalities) or other system benefits beyond the "yield" of one individual crop. In reality, what is needed today is a much more complex, layered understanding of the multifunctional, interconnected and synergistic interactions within an

				agroecosystem that includes multiple crops, medicinals, timber and animal products, provision of ecosystem services not captured as “yield” (for example, pollination, natural pest control, provision of drinking water, provision of beneficial soil communities that in turn produce soil organic matter, enable C sequestration, provide plant health support through mycorrhizal fungal networks etc etc.) while maintaining ecosystem function beyond the “services” that interests human society but that is critical to ecosystem integrity. The phrase “reducing productivity gaps by at least x%” should be removed from the Target.
2	20	B	117-119	Monitoring element for Target 9.1: replace “sustainable” with “agroecological”. “Sustainable” no longer has any meaning as a term, as it is widely used to refer to many non-sustainable practices, such as the “sustainable” use of (highly hazardous) chemical pesticides. As discussed above, over the past decade, numerous high-level panels of experts, intergovernmental and UN bodies, and scientific publications affirm that an agroecological transformation of agricultural systems is the most robust and appropriate response to ensuring the conservation of biodiversity, while promoting climate stabilization, healthy food, nutrition and diets, and system resilience. See, for example: HLPE, 2019. *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. http://www.fao.org/3/ca5602en/ca5602en.pdf International Panel of Experts on Sustainable Food Systems (IPES-Food), 2016. From Uniformity to Diversity. http://www.ipes-food.org/_img/upload/files/UniformityToDiversity_FULL.pdf IPBES. 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. https://ipbes.net/global-assessment Global Alliance for the Future of Food (2019): Beacons of Hope. https://foodsystemstransformations.org/wp-content/uploads/2019/08/BeaconsOfHope_Report_082019.pdf
2	20	C	118	Revise indicator to refer to: Again, neither “productive” nor “sustainable” are useful or meaningful terms and provide no helpful basis as a metric for determining progress away from practices that are devastating to biodiversity, contribute to climate change and harm to natural resources, while exacerbating land loss and social inequities, and *towards* beneficial multi-functional transformative approaches such as agroecology.

				Strongly encourage replacement of this indicator with the following 3 indicators: • *Land area (hectares or percentages) under established* ***agroecological*** *production.* This will typically translate into highly biodiversified, pesticide-free, soil-biodiversity-conserving, C-sequestering practices that support climate change mitigation and adaptation, climate resilience and ecosystem services (provision of clean water, pollination, natural pest control, maintenance of beneficial soil communities), all of which in turn support disaster risk reduction as well. Data gaps and measurement tools to capture land area under genuine agroecological production will need to be developed, but agroecologists at FAO and at various independent institutions, universities and within agroecological social movements, are available to assist. • *Land area under tree-based systems (agroforestry) that initiate an agroecological succession*, e.g. "food forests", silvo-pastoral systems and other holistic systems. Note that these integrate wild food, medicinals and fungi and through their cultivation, support greater diversity in both domesticated species and wild relatives. • *Land area in* ***transition*** *from conventional systems to agroecology*, i.e. showing progressive, increased agricultural and wild animal and plant diversity, use of vegetation covers, increased complexity in space and time of crop rotations, increased soil organic matter, etc. \\ *For empirical rigour in measuring "land area in transition," we recommend following Gliessman's 5 Levels in the hierarchy of transitions towards agroecology.* We previously provided Gliessman's descriptions above (see pages 4-6, or reference to Monitoring Framework page 116)
2	20	C	119	Recommend deleting the indicator specifying "conservation agriculture." Evidence indicates that conservation agriculture (CA) frequently refers to herbicide-based no-till, which is why CA is most frequently promoted by chemical companies that manufacture broad-spectrum herbicides like glyphosate (Roundup), and by industrial monocropping operations that replace tillage with large-scale herbicide applications that harm soil biology and wild plant species, in turn eliminating critical food, forage and nesting habitats for animal species.
2	20	C	120	A large body of scientific literature indicates that soil quality and soil biology (which provides the basis for healthy soil) is severely harmed by the application of chemical fertilizers and pesticides. Therefore, two indicator should be: • Reduced use and application of chemical fertilizers • Reduced use and application of chemical pesticides. o Note that indicators used to measure progress towards phaseout of chemical pesticides and reduction in pesticide toxicity and hazard should include a ***combination*** of metrics (e.g. pesticide toxicity, pesticide load, area treated, frequency of application, because reliance on single metrics alone fail to capture actual hazard or harm. **Explanation provided in row below.**

				• Details for measuring pesticide use, load, toxicity and application, etc. are also provided in comments from PAN International, and include: o France EcoPhyto Plan II and Denmark's Pesticide Load metrics
				Indicators used to measure progress towards phaseout of chemical pesticides AND reduction in pesticide toxicity and hazard should include a ***combination*** of the following metrics, because single metrics fail to capture actual hazard or harm. The explanation is provided here, with recommended indicators provided immediately following. • *Area treated with pesticides*; easily measured but note that measuring "area treated" *alone* fails to take into account changes in planted area of crops and may appear to show reductions in pesticide use when, in reality, it is the total planted area that has decreased. • *Reduction of toxicity of pesticides used, singly and/or in combination, and their hazard* e.g. to biodiversity, terrestrial – above and below-ground - and aquatic ecosystem health, ecosystem services including pollination, natural pest control, etc. and sensitive species. (This is an important indicator but note that evaluating toxicity of a single ingredient *alone* is insufficient if, on the other hand, pesticide load, area treated and treatment dose or frequency increase, and/or if pesticides are applied in mixtures, thereby potentially creating synergistic effects, while intensifying or extensifying exposure.) • *Treatment Frequency* (cf France EcoPhyto Plan II) – an important indicator but note that measuring "number of times treated" *alone* does not detail what dose of an active substance has been applied or its toxicity. See https://ec.europa.eu/food/sites/food/files/plant/docs/pesticides_sup_nap_fra-ecophyto-2_en.pdf • Measuring *Pesticide Load* (cf Denmark's approach) provides a useful approach https://www.sciencedirect.com/science/article/abs/pii/S0264837717306002
2	20	C	121	Please note that the Red List Index an inappropriate measure of pollinating species diversity, as it focuses on birds and mammals – but these are not significant pollinators. A more effective approach to measuring pollinator species would be pollinator visitation to crops. See Vaissière, B., Frietas, B., Gemmill-Herren, B. 2011. Protocol to detect and assess pollination deficits in crops: a handbook for its use. FAO, Rome.
2	20	C	122	The indicator given here refers to *ex situ* conservation only. In addition, an indicator measuring *in situ* conservation of plant and animal genetic resources (e.g. by Indigenous people and communities, and by farmers and in farmers' fields) is critical and should be added. This may represent a data gap that needs to be addressed.
2	21	0	0	Target 10 The term "nature-based solutions" in Target 10 should not be used, as it has no established scientific basis. Language in the target should be revised and "nature-based" should be replaced with "agroecological." The transdisciplinary field of agroecology has an established scientific basis of over 80 years, spanning ecology and evolutionary biology, the full range of plant and animal sciences, agricultural sciences and social sciences. In addition, the relevance of the established scientific

				approaches and principles of agroecology to solving today's pressing biodiversity, climate, water, energy and food system crises have been deepened and expanded through integration and cross-fertilization with local, traditional and Indigenous knowledge and practices. Agroecology has been clearly identified as *the* most robust, transformative approach to food systems change by the High Level Panel of Experts on Food Systems and Nutrition and has become the standard at UN bodies such as the UN Food & Agriculture Organization and UN Committee on Food Security: HLPE, 2019. *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome. http://www.fao.org/3/ca5602en/ca5602en.pdf FAO, 2018. Ten elements of agroecology. http://www.fao.org/agroecology/knowledge/10-elements/en/ International Panel of Experts on Sustainable Food Systems (IPES-Food), 2016. From Uniformity to Diversity. http://www.ipes-food.org/_img/upload/files/UniformityToDiversity_FULL.pdf IPBES. 2019. Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. https://ipbes.net/global-assessment Global Alliance for the Future of Food (2019): Beacons of Hope. https://foodsystemstransformations.org/wp-content/uploads/2019/08/BeaconsOfHope_Report_082019.pdf
2	21	B	127 +	Add monitoring element: trends in agroecosystems contributing to air contamination
2	21	C	127 +	Indicator for monitoring air quality: • *Decrease in frequency of use/area exposed to toxic air contaminants* (TAC). • *Reduction in toxic air pollutants, including persistent organic pollutants* Data sources and methods: See the TAC list provided by the California Office of Environmental Health Hazard Assessment; https://oehha.ca.gov/air/toxic-air-contaminants.) The CA Air Resources Board and CA Department of Pesticide Regulation have established an Air Monitoring Network to sample ambient air for multiple pesticides in multiple communities on a regular schedule: https://www.cdpr.ca.gov/docs/emon/airinit/air_network.htm Data are available from 2011 to the present (most recent update in 2019). Additional data-source for air quality: Data on toxic air pollutants are compiled by the U.S. National Parks Service. This program includes data on persistent organic pollutants (POPs), which are indicative

				of long-range transport of air contaminants. https://www.nps.gov/im/ngpn/air-quality.htm
2	21	B	128 +	Re: hazards, include new Monitoring Element: • Trends in pesticide poisonings
2	21	C	128 +	Add Indicator for trends in hazards: • number of poisonings attributed to exposure to pesticides (a new published report forthcoming, under review by journal, expected by 2021)
2	21	B	129 +	Add Monitoring elements: • Trends in contamination of aquatic ecosystems, surface and groundwater; • Trends in load of agrochemical contaminants into freshwater systems
2	21	C	129 +	Indicator for water quality: • Frequency/area of agrochemical contaminants appearing in surface water. Useful data sources: • The US Geological Survey (USGS) collects and analyzes chemical, physical, and biological properties of water, sediment and tissue samples from across the nation. https://waterdata.usgs.gov/nwis/qw • The USGS also collects data on agricultural contaminants specifically, including nutrients and pesticides: https://www.usgs.gov/mission-areas/water-resources/science/agricultural-contaminants?qt-science_center_objects=0#qt-science_center_objects • More information on USGS data and measurement tools to assess the presence of agricultural contaminants in water available here: • https://www.usgs.gov/mission-areas/water-resources/science/agricultural-contaminants?qt-science_center_objects=0#qt-science_center_objects • The Pesticide Risk Tool assesses pesticide products for impacts on aquatic ecosystems (as well as birds, earthworms, small mammals, pollinators and human health). Managed by the IPM Institute of North America, with support from the Integrated Plant Protection Center of Oregon State University, US EPA, USDA-NRCS. https://pesticiderisk.org/about
2	21	C	129 +	Additional indicators for ensuring water quality: • Reduction and elimination of use of known groundwater contaminants (since contaminants take a long time to reach groundwater, the indicator of impact on trends is not "presence of groundwater contaminants" themselves, but rather "reduction in and elimination of use" of such contaminants. • Pesticides exceeding levels of concern for aquatic organisms in surface water (US EPA). • Area treated/frequency/environmental load reaching water of **Highly Hazardous Pesticides**. The 2019 updated list of HHPs is provided here. It delineates methodologies for measuring presence and persistence of biodiversity-harming pesticides in water, sediment and soil. The PAN HHP list is based on classifications by recognised authorities and synthesizes information from WHO, US EPA, the EU Commission and the Pesticide Property Database. https://issuu.com/pan-uk/docs/highly_hazardous_pesticides_-_march?e=28041656/62901883

				Target 11
2	22	B	133	Add italicized section to monitoring element: "Trends in species that provide essential services *(including species responsible for pollination, natural pest control, etc.)"* – this enables biodiversity-supporting, green spaces such as urban farms and community gardens
2	22	C	0	Indicator for above monitoring element: • Pollinator index or pollinator visitation rates as per: Vaissière, B., Frietas, B., Gemmill-Herren, B. 2011. Protocol to detect and assess pollination deficits in crops: a handbook for its use. FAO, Rome. • Total weight of insect biomass as per: Hallmann CA, Sorg M, Jongejans E, Siepel H, Hofland N, Schwan H, et al. (2017) More than 75 percent decline over 27 years in total flying insect biomass in protected areas. PLoS ONE 12(10): e0185809. https://doi.org/10.1371/journal.pone.0185809 • Number and area of urban farms and community gardens providing healthy food and green space through organic, agroecological farming methods
				Target 13
2	25	A	0	Amend target 13.1 to include reference to participation by and accountability to directly affected communities, in particular Indigenous peoples. "At all levels" is good but insufficient, as it may be understood to reference governmental levels. It is critical that biodiversity-related policies, regulations and planning is developed through horizontal, respectful, deeply bottom-up participatory, democratic methods that center the leadership, knowledge, vision of Indigenous and local communities. There can be *no* biodiversity planning without these communities at the center. Suggested re-wording: T13.1. Biodiversity planning and policy-making processes at all levels engage and center the leadership, knowledge, vision and direct experiences of Indigenous and local communities.
2	25	B	0	Monitoring element for the revised Target 13.1 include: • Trends in meaningful engagement in biodiversity planning and policy-making processes by Indigenous and local communities
2	25	C	0	Indicator for above monitoring element: • # of countries with national biodiversity targets co-designed, developed and approved by local and Indigenous communities • # of locales with sub-national biodiversity targets co-designed, developed and approved by local and Indigenous communities • # of countries/locales with national or sub-national biodiversity targets that align with human rights instruments and agreements, such as UNDROP and UNDRIP.
				Target 14
2	27	B	0	Monitoring element to include: • Trends in reduction of use of biodiversity-harming products and practices
2	27	C	0	Indicators for the above: • **Various indicators** used in combination to measure chemical pesticide use and hazard (as explained above with explanation copied again in row below, use of a single metric is insufficient. A combination of metrics is required, including for example: *area treated, frequency of application, pesticide toxicity, pesticide load*).

				• **Use of neonicotinoid insecticides and area planted to neonicotinoid-coated seed** (recognizing the serious harm that neonicotinoids in particular pose to pollinators and beneficial insect species, as well as to avian reproductive success, including detrimental dietary impacts on birds that consume insects containing neonicotinoids residues, with resulting impacts on migratory success) • Note that "pesticide" includes insecticides, herbicides, fungicides, miticides, rodenticides and all other biocides. Data for each category can and should be disaggregated. • Area planted to genetically modified crops particularly in centers of diversity of related plants. (This is critical, as we have already seen the genetic contamination of non-GMO corn and wild corn-relatives e.g. in Mexico.)
				Indicators used to measure progress towards phaseout of chemical pesticides AND reduction in pesticide toxicity and hazard should include a ***combination*** of the following metrics, because single metrics fail to capture actual hazard or harm. The explanation is provided here, with recommended indicators provided immediately following. • *Area treated with pesticides*; easily measured but note that measuring "area treated" *alone* fails to take into account changes in planted area of crops and may appear to show reductions in pesticide use when, in reality, it is the total planted area that has decreased. • *Reduction of toxicity of pesticides used, singly and/or in combination, and their hazard* e.g. to biodiversity, terrestrial – above and below-ground - and aquatic ecosystem health, ecosystem services including pollination, natural pest control, etc. and sensitive species. (This is an important indicator but note that evaluating toxicity of a single ingredient *alone* is insufficient if, on the other hand, pesticide load, area treated and treatment dose or frequency increase, and/or if pesticides are applied in mixtures, thereby potentially creating synergistic effects, while intensifying or extensifying exposure.) • *Treatment Frequency* (cf France EcoPhyto Plan II) – an important indicator but note that measuring "number of times treated" *alone* does not detail what dose of an active substance has been applied or its toxicity. See https://ec.europa.eu/food/sites/food/files/plant/docs/pesticides_sup_nap_fra-ecophyto-2_en.pdf • Measuring *Pesticide Load* (cf Denmark's approach) provides a useful approach https://www.sciencedirect.com/science/article/abs/pii/S0264837717306002
				Target 16
2	32	A	0	Target 16 itself and all components that refer to impacts on "biodiversity and human health" should be amended to include "biodiversity, ***social equity*** and human health."
2	32	B	0	Add: "Trends in area planted to genetically modified, engineered or gene-edited crops"
2	32	C	0	Add indicators for the above trend: • area planted to genetically modified, engineered or gene-edited crops • area planted to herbicide-resistant genetically modified, engineered or

				gene-edited crops (as by design, this land area will receive increased application of herbicides, with resulting harmful impacts on biodiversity that have been well-documented in the scientific literature and reports from state and national agricultural and extension agencies) • area planted to insecticide-containing genetically modified, engineered or gene-edited crops (including *Bt* crops, as these crops are known to have had adverse impacts on non-target species)
2	32	A B	194 +	In both A & B, references to "development and adoption of …" should be amended to *include* language requiring "meaningful engagement, active participation, informed consent and approval of directly affected local and Indigenous communities
2	32	A B	198 +	In both A & B, references to "scientifically sound risk assessments and management" should be amended to *include* language requiring "the meaningful engagement, active participation, informed consent and approval of directly affected local and Indigenous communities
2	32	C	0	Indicators to reflect the meaningful engagement, active participation, informed consent and approval of directly affected local and Indigenous communities will need to be developed and added.
2	32	C	0	In addition, indicators to reflect prevent adverse impacts of biotechnology on social equity will need to be developed and added.
				Target 17
2	33	C	208 +	Additional indicators: ● # countries eliminating perverse subsidies for production practices harmful to biodiversity (e.g. for chemical pesticides & fertilizers) ● # countries providing incentives to protect ecosystem function (e.g. pollination, natural pest control, clean water, healthy soil communities, etc.) ● # countries redirecting incentives from harmful practices to instead reward or enable farmers to transition to biodiversified, organic and agroecological approaches (note large-scale organic does not typically support biodiversity, hence the indicator would need to ensure that organic agriculture embraces biodiversity; agroecological approaches are by definition supportive of biodiversity) ● % of farmers/areas receiving such incentives and successfully transitioning from conventional biodiversity-harming practices to biodiversity-protective, agroecological practices.
2	37	A B	0	Target 19 Amend T19.1, T19.2, T19.3 and the accompanying monitoring element to specifically include that the biodiversity-related information, values and education **includes the knowledge and values of local and Indigenous communities.**
2	37	C	0	None of the provided indicators from Rows 226-237 provide any useful ways to measure or assess progress in trends or towards components of Target 19 that have to do with **respecting, uplifting, valorizing and ensuring the continued intergenerational and intercultural transmission of Indigenous and local peasant knowledge.** **Additional indicators will need to be developed and added here, as a matter of highest priority.**

Comments should be sent by e-mail to secretariat@cbd.int ***no later than 15 August 2020****.*