



Joint Submission by Conservation International, Land Use & Climate Knowledge Initiative, and National Wildlife Federation on Topic 2(b) and 2(c) of Decision 4/CP.23, related to the Koronivia Joint Work on Agriculture

The views in this submission represent the consensus of the Land Use & Climate Knowledge Initiative, Conservation International, and National Wildlife Federation which have worked together in a coalition for many years to promote sensible mitigation and adaptation opportunities in the land sector. We welcomed the adoption of the Koronivia road map during SBSTA/SBI 48, and we are grateful for the opportunity to submit views on topics 2(b) Methods and approaches for assessing adaptation, adaptation co-benefits and resilience and 2(c) Improved soil carbon, soil health and soil fertility under grassland and cropland as well as integrated systems, including water management.

The KJWA process and progress to date

Our organizations observed the workshop at SBSTA/SBI 49 with great interest and we were grateful for the opportunity to make an intervention during the workshop. We continue to engage with various country delegations and to organize informal events with the intention of contributing to progress in the KJWA.

During the workshop, the Constituted Bodies discussed many constructive activities under the UNFCCC related to agriculture. However, we also shared the concern expressed by some Parties: namely, that these Constituted Bodies lack a mandate to contribute directly to the goals of the KJWA, which sometimes leads to a mismatch between their efforts and the goals of the KJWA process. Furthermore, without an established mandate, the Constituted Bodies must receive a formal invitation simply to communicate their activities. In our view, the *ad hoc* nature of this relationship should be strengthened and formalized, through **a mandate in a COP decision**, which will improve communication and coordination between the KJWA and the Constituted Bodies. This, in turn, can help Parties access the information and outcomes of the Constituted Bodies' efforts, which can support and improve Parties' efforts in the agriculture sector.

Building on this point, we support the call from many Parties for the KJWA process to focus the upcoming discussions on issues that can directly support implementation of actions that benefit agricultural stakeholders. Past experience also tells us that such actions can sometimes create unintended harm. To minimize potential harm and maximize potential benefits, we re-emphasize

the suggestion made in our previous submission,¹ urging Parties to discuss **safeguards** in relation to each topic in the Koronivia Roadmap. Consideration of safeguards should be informed by inclusive participation of stakeholders who may be affected by policy actions and the implementation of activities. An inclusive process would provide ample opportunity to consider perspectives relevant to gender, smallholders, indigenous peoples, and local communities.

2(b). Methods and approaches for assessing adaptation, adaptation co-benefits and resilience

Topic (2b) of the Roadmap should **highlight assessment methods and approaches to guide national decision-making processes** around agriculture, adaptation, adaptation co-benefits, and resilience. **Countries should use available quantitative and qualitative data to understand how much an agricultural system is changing in order to minimize the impacts of climate change at national and subnational scales. Approaches and methods may include measurement, as well as description, comparison, simulation, or observation.** Sources of information should be based to the extent possible on existing national information systems, and improved over time. The assessment of progress towards adaptation should be a continuous process, requiring constant consideration of how results and lessons learned from preceding stages should aid further development.

To ensure food security and safeguard against indirect impacts to livelihood or ecological processes from climate change, **assessments should take an integrated approach to the technical, social, cultural, economic, and ecological aspects of agricultural systems.** For example, assessing adaptation may involve monitoring the technical goal of maintaining production volume in a changing climate. Importantly, it should also monitor i) the provision of ecological function (i.e. ecosystem services) that underpins agricultural production, and ii) the resilience of social systems, such as smallholder farmers, who represent the largest number of agricultural producers globally.² This multi-pronged approach is important to track the connections between agricultural production, ecosystem services, and livelihoods in the context of climate change.

Decision-making processes at national, subnational, and local levels can use frameworks like ecosystem-based adaptation (EbA) that address the importance of biodiversity and ecosystem services to support adaptation and resilience in the agricultural sector. In general, these adaptation strategies should strive to: 1) improve the understanding of the effectiveness of different EbA practices; 2) develop supportive and integrated agriculture and climate change policy that specifically promotes ecosystem-based options as part of a broader adaptation

¹ Joint submission by Conservation International, Environmental Defense Fund, Woods Hole Research Center, National Wildlife Federation, Forest Trends, and Center for Carbon Removal on matters relating to agriculture (Decision 4/CP.23). Available at:

https://www4.unfccc.int/sites/SubmissionsStaging/Documents/201804251506---Submission%20on%20agriculture_CCR%20CI%20EDF%20FT%20NWF%20WHRC.pdf

² Vignola, Raffaele et al. 2015. Ecosystem-based adaptation for smallholder farmers: Definitions, opportunities and constraints. *Agriculture, Ecosystems & Environment*, 211: 126-132. Available at: <https://www.sciencedirect.com/science/article/pii/S0167880915002157>

program for agriculture; 3) establish and maintain strong and innovative programs to aid smallholder farmers with implementation.³

Assessing Ecosystem-based Adaptation

To monitor the progress of the implementation of adaptation policies, strategies and actions, adaptation indicators should quantify, standardize and communicate often complex and disparate data to convey progress towards specific adaptation targets. Performance-based, outcome indicators can help to assess adaptation consistently across multiple considerations. Due to the wide range of adaptation strategies across regions, **general adaptation indicators should be simple, measurable, analytically sound, relevant to policy, and transparent.**⁴ Performance-based indicators should be used to assess adaptation efforts that include ecosystem-based approaches and reflect regional or national priorities and goals. Prior to adaptation implementation, a baseline of key performance-based indicators should be determined and measured to serve as a reference for implementation and post implementation phases. Baseline indicators should be measured before, during and after implementation of adaptation actions.⁵ The assessment of adaptation outcomes should be done in an integrated way, so as to highlight synergies, gaps and future needs.

Assessing Adaptation Co-Benefits

Implementation of adaptation strategies and activities for agricultural systems can bring co-benefits such as mitigation of greenhouse gas emissions, improved or diversified livelihood outcomes, and increased biodiversity and increased water flow regulation. To recognize these benefits, approaches to assessing these co-benefits should be included as part of an overall adaptation strategy in agriculture. Because nature-based solutions have longer ecological timeframes to achieve impacts, ongoing monitoring frameworks can help compile a broader evidence base for successful interventions.

Assessing Mitigation Co-benefits. While comprehensive guidance is not agreed on agriculture, quantified co-benefits of reduced emissions from agricultural activities and increased vegetative cover can be estimated using existing sector-specific guidance for national greenhouse gas inventories provided by the UNFCCC.

Assessing Livelihood Co-benefits. Assessments of EbA practices for human well-being should include the following indicators: assets, livelihoods, food security, safety and security, health, and culture. It is important to include local communities in the development of an integrated baseline for these indicators to ensure implementation measurements of adaptation include socio-ecological components and key ecosystem services.⁶

Assessing Biodiversity Co-benefits. Adaptation activities in agriculture can bring increased biodiversity from increased vegetative cover, protected riparian areas, improved

³ Ibid.

⁴ Food and Agriculture Organization of the United Nations. 2017. Tracking adaptation in agriculture sectors. Climate change adaptation indicators. Available at: <http://www.fao.org/3/a-i8145e.pdf>

⁵ Conservation International. 2017. Submission to SBSTA regarding indicators of resilience and adaptation. Available at: https://unfccc.int/files/parties_observers/submissions_from_observers/application/pdf/911.pdf

⁶ Ibid.

pollinator habitat or other efforts. Performance-based indicators will help to better relay adaptation outcomes more so than indicators which focus on project inputs and outputs.

Assessing Resilience

Methods to assess resilience of the agricultural sector should describe how well the sector is able to respond to the impacts and trends of climate change while still maintaining its essential characteristics. EbA practices can be employed at both the level of the field and farm, as well as across the landscape, which can increase diversity of land use, thus providing additional options in case of climate impacts. These indicators should reflect a range of participatory methods (e.g. using remote sensing, household surveys, focus group discussions, field measurements) and diverse stakeholders (e.g. researchers, smallholders, indigenous peoples, and women). Indicators for measuring resilience in agriculture could include:

- Avoided losses or maintained crops yields because of extreme weather-related events
- Prevalence of moderate or severe food insecurity in the population after extreme weather events or through time,
- Avoided unsustainable and detrimental coping strategies (e.g. selling of productive assets, forced migration, removing children from school)
- % of agricultural infrastructure damaged after extreme events,
- Average income from sustainable crop and/or livestock production, sustainable marine and freshwater fisheries, and/or eco-tourism of small-scale per household after extreme weather events, or through time.

Biodiversity is a critical indicator for assessing resilience, as the diversity of genes, species and ecological processes are essential to the provision of ecosystem services, and thus productive agricultural systems.⁷ For example, biodiversity provides important pollinators, seed dispersers, and pest control agents on which agriculture depends. Biologically simplified farming systems, like monocultures, have been connected to water-related issues such as pollution, toxic algal blooms, and depletion of groundwater. These systems are also prone to soil erosion and degradation, and loss of pollinator species, all of which affect system resiliency.⁸ There are a wide array of practices which can better integrate biodiversity conservation into commodity production landscapes, including the creation of buffers around sensitive areas, the maintenance of native vegetation and wildlife corridors, the maintenance of key species interactions, and controlling aggressive, overabundant invasive species. Avoiding the conversion of native habitats to cropland whenever possible is also necessary to maintaining biodiversity in landscapes.

⁷ Fischer, Joern & Lindenmayer, David & Manning, Adrian. (2006). Biodiversity, ecosystem function, and resilience: Ten guiding principles for commodity production landscapes. *Frontiers in Ecology and The Environment*, 4: 80-86. Available at:

https://www.researchgate.net/publication/237657950_Biodiversity_ecosystem_function_and_resilience_Ten_guiding_principles_for_commodity_production_landscapes

⁸ DeLonge, M and Basche, A 2017 Leveraging agroecology for solutions in food, energy, and water. *Elem Sci Anth*, 5: 6, DOI: <https://doi.org/10.1525/elementa.211>

2(c). Improved soil carbon, soil health and soil fertility under grassland and cropland as well as integrated systems, including water management

Soil carbon, soil health, and soil fertility create the foundation for a successful agricultural system. Efforts to improve these components can increase agricultural productivity, as well as provide climate benefits for mitigation and adaptation -- a point captured well in the last helpful and relevant synthesis produced for SBSTA.⁹ In our view, the findings of that technical paper remain valid and relevant. We concur with the findings of that effort, such as statements that the abundant opportunities and synergies in this area should be integrated within comprehensive national policy efforts, should address the diverse benefits potentially achievable, and should be accelerated by further research and development. Unfortunately, progress on these issues has not been as rapid as hoped during the intervening decade since this technical paper was released.

However, additional scientific research on this topic has strengthened those findings, deepened our understanding of key issues, and elaborated on the potential for positive outcomes. For example, a recent assessment¹⁰ produced a detailed, spatially explicit quantification of the global potential for agricultural soils to sequester and store carbon -- a resource that could inform country strategies to improve soil carbon. Another global assessment put agricultural mitigation practices -- including soil carbon sequestration -- in the context of other "natural climate solutions," showing that agriculture could contribute significantly to land-sector mitigation activities, which collectively could deliver nearly 1/3 of all mitigation needed to meet the Paris Agreement goals.¹¹ Yet another assessment investigated the challenges, needs, and tradeoffs of various approaches to meeting climate, food security, and other Sustainable Development Goals.¹²

We also have a greater awareness of the variety of on-farm, off-farm, and policy actions that can improve the health of soils for the benefit of farmer livelihoods, food security, resilience, and climate mitigation.¹³ These actions can also drive improvements in associated ecosystem services, such as water retention, water availability, habitat for biodiversity, pollination services, all of which are increasingly relevant in the context of climate change. Two well-known examples of these good practices and their benefits include:

⁹ UNFCCC. 2008. Challenges and opportunities for mitigation in the agricultural sector. Technical paper. Available at: <https://unfccc.int/resource/docs/2008/tp/08.pdf>

¹⁰ Sanderman, J., T. Hengl, and G.J. Fiske. 2017. Soil carbon debt of 12,000 years of human land use. PNAS 113(36): 9575-9580. Available at: <https://www.pnas.org/content/pnas/114/36/9575.full.pdf?fref=gc&dti=746993978721787>

¹¹ Griscom, B.W., and 31 others. Natural climate solutions. PNAS 114(44): 11645-11650. Available at: <https://www.pnas.org/content/114/44/11645>

¹² Searchinger, T., R. Waite, C. Hanson, J. Ranganathan, P. Dumas,, and E. Matthews. 2018. Creating a sustainable food future: a menu of solutions to feed nearly 10 billion people by 2050. World Resources Institute. Available at: <https://www.wri.org/our-work/project/world-resources-report/world-resources-report-creating-sustainable-food-future>

¹³ For a comprehensive review of such practices, see Toensmeier, E. 2016. The Carbon Farming Solution: a global toolkit of perennial crop and regenerative agriculture practices for climate change mitigation and food security. Chelsea Green Publishing, White River Junction, Vermont.

1. **Cover Crops.** After harvest, barren or partially-tilled fields lead to a long-term process of decreased soil fertility. **The increased use of cover crops often reduces soil compaction, protects soil from wind and water erosion, provides habitat for beneficial pollinators, and increases water retention and soil nutrients, among other benefits.**¹⁴ These benefits increase the overall resiliency of the farming system, in part by improving the capacity for water availability in soils across agricultural landscapes, one of several factors that will be increasingly important as climate-related impacts drive greater variability in agricultural production factors.
2. **Agroforestry.** Agricultural systems that combine trees and food crops, including alley cropping, can provide multiple benefits to soil carbon, soil health and fertility. These diversified production systems increase the vegetative cover, aboveground carbon from biomass, biodiversity habitat, and diversity of income streams, which is especially important for the resilience of smallholder farmers.

Due to the ongoing needs for such services and the widespread applicability of many beneficial practices, we see **great potential value in countries sharing lessons from implementing these good practices and increasing their incorporation into national policies for climate action.** International dialogues and initiatives have proven to be valuable channels for sharing such lessons, disseminating research, and articulating the next frontier of pressing research needs.¹⁵ We encourage countries to host, support, and contribute to such efforts and to ensure the widest possible participation from relevant stakeholders.

Even with these scientific advances and productive exchanges, we see an ongoing need for research -- particularly action-oriented research tailored to the needs of specific countries, agriculture systems, and stakeholders. Furthermore, many countries still lack access to locally relevant research and information regarding soil carbon and effective management practices. **The UNFCCC, and the KJWA in particular, could serve as a channel for addressing these needs and improving outcomes on the ground.** This information should be specific to the biomes, soils, and management practices relevant at the scale of agricultural operations.

We see pathways emerging that could accomplish the necessary changes that will keep the GHG fluxes in the agricultural sector on course to achieve the Paris Agreement goals.¹⁶ Countries are taking steps to assess their own potential contributions from the agricultural sector,¹⁷ and we encourage more countries to undertake such efforts. Importantly, soil management strategies should take account of the overall greenhouse gas (GHG) impacts of implementation, due to the fact that some approaches to improve soil carbon can lead to displacement of emissions or generate emissions of other potent GHGs, such as methane (CH₄).

¹⁴ Stockwell, R and Bitan, E. 2011. Future Friendly Farming. The National Wildlife Federation. Available at: <https://www.nwf.org/~media/PDFs/Wildlife/FutureFriendlyFarmingReport.pdf>

¹⁵ For example, a 2017 conference on sequestering carbon in soil yielded a number of lessons, captured in a conference report available at:

<https://static1.squarespace.com/static/5c3780907c9327dc2a2e8c64/t/5cb4aeaf7817f7b49d8df17f/1555345078008/Final+Report+-+Sequestering+Carbon+in+Soil+-+word.pdf>.

Also, the Global Research Alliance on Agricultural Greenhouse Gases (<https://globalresearchalliance.org/>) regularly conducts workshops on relevant topics, serves as a repository of information, and provides a forum for a communities of practice in low-carbon agriculture.

¹⁶ Vermeulen, S., and 15 others. 2019. A global agenda for collective action on soil carbon. Nature Sustainability 2: 2-4. Available at: <https://www.nature.com/articles/s41893-018-0212-z>

¹⁷ E.g. Fargione, J.E., and 37 others. Natural climate solutions for the United States. Science Advances 4: eaat1869. Available at: <https://advances.sciencemag.org/content/4/11/eaat1869>

and nitrous oxide (N₂O). These strategies, the research that underpins them, and their implementation will be out of reach for many countries, and so we encourage those countries in a position to provide support to do so. In particular, climate finance may be needed to help achieve the potential contributions from agriculture (and other land sector activities) for the initial NDCs.¹⁸

The steps necessary to achieve the required agricultural transformation will not be easy, but we see the KJWA process as a key venue for achieving those steps. As members of civil society, we will work to ensure the value and integrity of the KJWA, and we stand ready to contribute to its success.

¹⁸ Kissinger, G., A. Gupta, I. Mulder, and N. Unterstell. 2019. Climate financing needs in the land sector under the Paris Agreement: an assessment of developing country perspectives. *Land Use Policy* 83: 256-269. Available at: <https://www.sciencedirect.com/science/article/pii/S0264837717313728>