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Making the post-2020 global biodiversity framework a successful tool for building biodiverse, inclusive, resilient and safe food systems for all

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1. Introduction

COVID-19 has exposed the vulnerability of our economies to shocks, and it has laid bare deep inequalities in our society that threaten to derail the Sustainable Development Goals. Governments around the world are looking for recovery options that deliver new jobs and businesses. Few sectors link job creation so closely to sustainable green production as the food sector. It is the largest source of employment in many countries in the global South. At the same time cities depend upon imported food that is produced in far-away countries and shipped around the world. The trillions of dollars to be invested in recovery from COVID-19 offers an unprecedented opportunity for a clean, green and just transition to a more biodiversity-friendly agricultural and food system. Key among the political opportunities to shift the post-pandemic world towards sustainability and resilience are the ongoing deliberations of the Post-2020 Global Biodiversity Framework. The Post-2020 Framework will be the precedent for national governments to bridge economic action with the key need for a green, resilient recovery. The United Nations Convention on Biological Diversity (CBD) has traditionally seen agriculture as one of the biggest threats to biodiversity and has been actively promoting the protection of natural ecosystems by concentrating its efforts on preventing further expansion of agriculture. But it has not explicitly recognized the importance of mixed, diverse agricultural landscapes for their contribution to the conservation of wild biodiversity. The CBD has an opportunity to bring its influence to bear on international policy favouring investments in local production and marketing capacity to replace imported food and beverages. This will contribute to both COVID-19 recovery through creation of rural jobs and income and empowering governments and consumers to support diverse, mixed agricultural systems that conserve and enhance biodiversity as well as reduce greenhouse gas emissions.

COVID-19 has exposed the vulnerability of our economies to shocks and it has laid bare deep inequalities in our societies that threaten to derail the Sustainable Development Goals (SDGs). Governments around the world are looking for recovery options that deliver new jobs and businesses. The recent 11th Petersberg Climate Dialogue concluded with a commitment to a green recovery built on solidarity. With governments and private-sector commitments for investing trillions of dollars to build an inclusive, green and resilient future, there is an opportunity to tackle one of the most controversial parts of our economy: the food sector. Several landmark reports last year, such as the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science–Policy Platform on Biodiversity and Ecosystem Services (IPBES 2019); the Lancet report on food in the Anthropocene (Willet *et al* 2019), the special report on Global Warming of 1.5 °C of the Intergovernmental Panel on Climate Change

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(IPCC 2018) and the global consultation report by the Food and Land-Use Coalition (Food and Land-Use Coalition 2019) exposed society to the truth that our current agricultural system is threatening both human wellbeing and our societies.

At this moment, delegates to the United Nations Convention on Biological Diversity (CBD) are deliberating the elements of the Post-2020 Global Biodiversity Framework, which will provide the basis for action to achieve the CBD goal of Living in Harmony with Nature. It supersedes the Aichi Biodiversity Targets that expire at the end of 2020. The CBD is the forum for developing global policy on biodiversity. The Post-2020 Framework will be the precedent for national governments to bridge economic action with the key need for a green, resilient recovery.

Few sectors link job creation so closely to sustainable green production as the food sector. It is the largest source of employment in many countries of the global South. At the same time, consumers in cities depend upon imported food that has been produced in far-away countries and shipped around the world. Even before COVID-19, concerns had been growing about the challenges facing our current food systems to provide permanent and reliable access to adequate, safe, local, diversified, fair, healthy and nutrient-rich food for all (Bertiand Mulligan 2016, Willett *et al* 2019). In 2015, 209 cities signed the Milan Urban Food Policy pact. The key strategies and actions as laid out by the signatories are built around the common goal to link urban, peri-urban and rural areas to ensure that local farming produce can cater for the needs of a growing urban population in a sustainable way (Filippini *et al* 2019). Re-construction of regional and local agri-food systems to create jobs and viable local agribusinesses needs governmental interventions such as investments in farmers' cooperatives to help farmers shift from being only growers to becoming producers; linking farmers directly to consumers in cities through technology; initiating markets for diverse 'food baskets' through government procurement for schools, hospitals, creches and day-care centres; and diversifying food production to meet increasing demand for healthy and diverse diets (Berti and Mulligan 2016, Willett *et al* 2019). This will require a shift in policies and financial incentives that favour mostly simplified, monocultural, conventional agriculture to policies that actively promote biodiversity-friendly mixed farming. The Post-2020 Framework is an opportunity that must not be lost for an influential sector of the international community to decide that future food systems should be designed to conserve biodiversity and the vital farm-friendly services that biodiversity provides.

Crop- and livestock-based agriculture has expanded to meet the food demands of a burgeoning population that is expected to rise to over 9 billion by 2050 (IPBES 2019). Agriculture takes up between 30% and 40% of the Earth's land surface and, hence, has a disproportionate effect on biodiversity, climate change and human wellbeing (Foley *et al* 2005, Donald and Evans 2006, IPBES 2019). Taking advantage of geographical production advantages and building on economies of scale, complex and powerful systems have evolved to ensure the efficient supply of cereals and meat around the world. As a consequence, farming systems have also been adapted to maximize production and efficiency (Thrupp 2000, Foley *et al* 2005, Willett *et al* 2019). These systems usually involve high levels of specialization both in terms of producers and produce, characterized by the establishment of large areas of monocultural and intensive livestock production (Foley *et al* 2005, Tscharntke *et al* 2005, IPBES 2019). Unfortunately, they have immense impacts on biodiversity and are ecologically (Thrupp 2000, IPBES 2019) and economically (Canning 2011, Bert and Mulligan 2016) unsustainable in the long term. The rise of highly specialised, vertically integrated, large private food enterprises has resulted in a declining share of profit on the producers' side, unequal bargaining power along the value chains and increasing barriers to market access for smallholders (Berti and Mulligan 2016).

A common argument for specialized conventional agriculture is that it has led to the availability of abundant, affordable food (Godfray *et al* 2010). This argument is simplistic and tendentious. There is ample evidence that the current global food system in many countries has resulted in poor nutrition, obesity and related non-communicable diseases (Foley *et al* 2005, Willett *et al* 2019). Internalization of the costs to human health and of restoring ecosystem services would expose the myth of cheap food and question the profitability of these systems (Tscharntke *et al* 2005, Hein *et al* 2020). Furthermore, unsustainable food production practices are often heavily subsidized by national governments. If similar investment were put into biodiversity-friendly mixed farming systems, many of the current failures could be rectified and productivity greatly increased (Thrupp 2000, Tscharntke *et al* 2005, HLPE 2019, Willett *et al* 2019).

The CBD traditionally has seen agriculture as one of the biggest threats to biodiversity and has actively promoted the protection of natural ecosystems by concentrating its efforts on preventing further area expansion (Foley *et al* 2005, IPBES 2019). A lack of a broader appreciation of the importance of agricultural biodiversity has roots in the origins of the 'Rio' conventions when agriculture and forestry were to a great extent left out of convention mandates to be handled by existing international agencies. This poses challenges in making changes in how biodiversity is viewed within the CBD. What is needed is the political recognition that agriculture has to be managed in a way that enhances the value of landscapes for biodiversity conservation while providing

safe, fair and healthy diets to all (Tscharntke *et al* 2005, Donald and Evans 2006, Gardener *et al* 2009, Stoate *et al* 2009).

The CBD must be clear that food and agriculture should be harnessed as a tool for biodiversity conservation (HLPE 2019, FAO 2019). Agricultural land must be recognized for its contribution to sustainable use and conservation of biodiversity:

- as habitat for species and varieties, cultivated or otherwise, used by humans (agrobiodiversity, including agricultural species and beneficial species), to support food production (Thrupp 2000, Tscharntke 2005, FAO 2019, Willett *et al* 2019);
- as habitat for wild biodiversity for those species that use agricultural landscapes to fulfil all or part of their niche requirements, as well as strictly forest-dwelling species that use the agricultural matrix to disperse between forest fragments (Donald and Evans 2006, Gardner *et al* 2009, Stoate *et al* 2009, Heller and Zavaleta 2009);
- for ecosystem services that support human health, food security, climate change mitigation and water supply (Thrupp 2000, FAO 2019, Willett *et al* 2019, Harrison and Gassner 2020).

The CBD has been ambivalent on guiding parties in conserving and sustainably using biodiversity in human-managed ecosystems, principally agricultural land. The Aichi Targets were aimed at sustainability of production rather than specifically at biodiversity conservation, and confounded sustainable intensification and biodiversity conservation, assuming they were inherently linked. Indicators focused on land under organic production, areas under conservation agriculture and under sustainable agriculture. The actual protection of species was limited to indicators such as the Wild Bird Index for farmland species and the Living Planet Index for farmland specialist species. However, these indicators do not capture information on biodiversity beyond a few species that live on farms whereas it is the effects of agriculture on broader wild biodiversity within a landscape that is most important (Donald and Evans 2006, Heller and Zavaleta 2009).

To avoid these deficiencies the Framework should address the two following challenges.

(a) Recognize the 'landscape approach' as a means of managing biodiversity that includes both 'natural' landscapes (which must be protected) but also multi-use mosaic landscapes that blend many forms of productive use with conservation, including agriculture, woodland, grassland, waterbodies and wilderness. Agricultural land within these landscapes should be managed in a manner that optimizes biodiversity conservation and links protected areas to permit the movement of species. The principles of landscape approaches have been well defined and broadly accepted (Sayer *et al* 2017) and encompass a much broader set of objectives than 'spatial planning', the term included in the current draft of the Framework.

(b) Marshal a transformative shift from policies that favour mostly simplified, monocultural, conventional agriculture to policies that actively promote biodiversity-friendly mixed farming at a landscape scale. Many farmers around the world already manage mixed farming systems, combining a diversity of crops, animals and trees with different spatial and seasonal arrangements. Their farms mimic natural processes, making the best of interactions between each part. The fertility of the soil is improved thanks to protection and recycling of nutrients by trees and manure from animals so crops are more productive and better protected from pests and diseases, with less need for artificial inputs like fertilizers, herbicides and pesticides (Thrupp 2000, HLPE 2019). Such systems, combined with the deliberate incorporation of wild trees and shrubs, the maintenance of uncultivated land and niches and the establishment of corridors, will transform food production.

1.1. How to achieve this in practice

The negotiations of the Post-2020 Framework are an opportunity for agriculture and food to be appropriately integrated into the Convention and to rethink the prevailing reductionist view of agriculture and nature (Tscharntke *et al* 2005) to ensure inclusive, green and resilient economic recovery. The challenge will be to convince delegates that improved management of agricultural land is an important means of conserving and sustainably using biodiversity. Food and agriculture are part of the solution.

The zero draft of the Framework is a commendable effort to provide a global policy guide that is both comprehensive in its scope yet also simple enough for use as a policy and management tool. However, food and agriculture are becoming lost in its structure. The Framework anticipates two outcomes: 1) Resilient ecosystems and healthy species; and 2) Human needs met. In practice as drafted, this is segregating the Framework into policies that imply a vision of the world where protected areas are relied upon as havens for biodiversity and managed places are restricted to benefits for humans. Landscapes and habitats are only discussed in the context of species conservation in protected areas, ignoring the huge potential of agricultural landscapes for improving biodiversity conservation (Donald and Evans 2006).

The goals in the zero draft and their associated targets refer entirely to 'natural' ecosystems and exclude managed ecosystems. We strongly recommend the expansion of the scope of these goals through a landscape approach that encompasses both natural and managed ecosystems.

Alternatively, or additionally, as has been discussed by CBD delegates, an extra target could be

included on food and agricultural systems. If such a new target were to be proposed it could serve to enhance coherence between the CBD and other conventions and international agreements. For example, in addition to encompassing core concepts like species conservation and connectivity, specific language could be included relating to the restoration of landscapes by 2030. Agricultural land is critical for adaptation and mitigation to climate change (Harrison and Gassner 2020), and a specific target relating to the use of tree species in agricultural landscapes would link effectively with the Paris Agreement. The United Nations Convention to Combat Desertification aspires to achieve land degradation neutrality; a CBD target including soil biodiversity conservation would support that (Heller and Zavaleta 2009). The 2021 UN Food System Summit could mobilise actionable commitments for such a target.

The proposed Framework includes goals corresponding to the Human Needs are Met dimension of biodiversity. One of the targets under this cluster is 'Conserve and enhance the sustainable use of biodiversity in agricultural and other managed ecosystems to support the productivity, sustainability and resilience of such systems, reducing by 2030 related productivity gaps by at least [50%]'. This proposed target refers to the use of biodiversity in food and agricultural systems, acknowledging the importance of diversity of crop varieties and livestock breeds and their wild relatives for food production, but does not refer to wild biodiversity that exists on and uses farms to move between protected areas. We strongly support this target recognizing the importance of agrobiodiversity but reiterate our argument that the habitat and the connectivity function of landscapes is only provided by mixed farming systems. The farming systems that dominate landscapes are strongly influenced by our choice of food systems and decisions made all along value chains not only at the production end (Stoate *et al* 2009). A transformational change of food systems based on biodiversity-friendly mixed farming systems, whereby we use, manage and sustain the full breadth of species that depend on agricultural landscapes, can only be achieved through commitments from all actors to promote diversified diets through diverse, sustainable food systems.

Re-construction of regional and local agri-food systems and value chains to cater for the diverse dietary demands of a burgeoning rural population will directly create job and business opportunities for rural areas, especially for young people. However, to ensure that this will indeed contribute to equity and inclusiveness both political will and investments into small family farms and their crops are required to help farmers shift from being only growers to becoming viable small- to medium-sized enterprises (Tscharntke *et al* 2005, Berti and Mulligan 2016).

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Data availability statement

No new data were created or analysed in this study.

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