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In the time of crises

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White Paper

The 'triple challenge' and tackling trade-offs between climate, food and biodiversity goals

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Key messages:

- Humankind faces a triple challenge over the next 30 years: meeting the dietary and other needs of 10 billion people, keeping global temperature rise below 1.5°C, and reversing biodiversity loss.
- These three goals are interdependent. While there are synergies, there are also trade-offs: progress on one goal may undermine others depending on the responses prioritised.
- In 2021, UN summits on biodiversity, climate change and the food system provide an unprecedented opportunity to take an integrated approach to these goals, especially while we rebuild our economies and societies in the wake of COVID-19.
- There are a small number of well-evidenced responses that can reduce competition between the goals, and these must be a priority for global governments and businesses.
- But trade offs will remain. Three approaches can help navigate these:
  - » full national policy integration on biodiversity, climate and food, starting with joined-up national submissions for the three global summits;
  - » integrated research across the three goals and politically relevant tools to enable policy makers to better identify and compare solutions; and
  - » launching national and sub-national 'triple challenge dialogues' with non-state actors to identify and negotiate trade-offs and develop appropriate responses.

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Introduction: the triple challenge

Simultaneously avoiding dangerous climate change, halting and reversing dramatic biodiversity loss and meeting the needs of a growing global human population are three interlinked and critical goals we must achieve in this half-century. Climate change is increasingly recognised as a global emergency, with the current ~1°C of global warming already negatively affecting people and nature all around the world (IPCC, 2018; IPCC 2019a,b).

At the same time, there is growing evidence that we are at the start of the sixth mass extinction in our planet's history. Population sizes of vertebrates decreased, on average, by 60% globally between 1970 and 2014 (WWF 2018). One million species are threatened with extinction globally – a rate unprecedented in human history (IPBES 2019). This loss is a result of human activity, particularly from food production, and at the same time constitutes a direct threat to human well-being in all regions of the world (IPBES 2019).

The needs and aspirations of our growing global population are many and varied. While recognising that the needs of those suffering hunger or extreme poverty stretch beyond securing good nutrition and food security, we focus here on the food sector as it is the major economic sector driving the use and conversion of land, the single biggest consumptive water user and, through fisheries, has significant impacts on ocean habitats. Globally, the way we currently produce and consume food is resource-intensive and unhealthy. While over one third of adults worldwide are overweight or obese[1], 1 in 9 are undernourished[2] and a third of the food we produce is lost or wasted[3].

Human impact on the planet is a function both of the number of individuals and their patterns of consumption. Although global population growth is slowing as, generally, people are choosing to have fewer children, current models suggest we will reach between 9.4 and 10.1 billion in 2050 and slowly level out by the end of the century (UN DESA 2019). Further, the continuing rise in the global middle class, expected to be well over half the total human population by the end of the decade, increases global impact due to more resource-intensive lifestyles.

We do not know definitively where or how the COVID-19 pandemic emerged, but there is growing evidence that the way we manage ecosystems and use wild animals increases the risk of spillover of diseases from animals to humans. Over half of emerging infectious diseases are from animals, with over 70% of those from wildlife, and exacerbating factors include deforestation and environmental degradation (Jones et al 2008; Jones et al 2013). COVID-19 and the need to rebuild society and economies in its wake is the near term crisis in which our need to reform food systems, achieve sustainable management of biodiversity and ecosystems, and the economic imperative to avoid dangerous climate change will play out.

1 https://www.who.int/gho/ncd/risk_factors/overweight/en/ Accessed 11/5/2020

2 https://www.who.int/news-room/detail/11-09-2018-global-hunger-continues-to-rise---new-un-report-says Accessed 11/5/2020

3 http://www.fao.org/food-loss-and-food-waste/en/ Accessed 11/5/20

It is clear that continuing on a business-as-usual path is not an option. Even individually, climate change, biodiversity loss, and food security would pose tremendous challenges for the global community, but together they form a triple challenge.

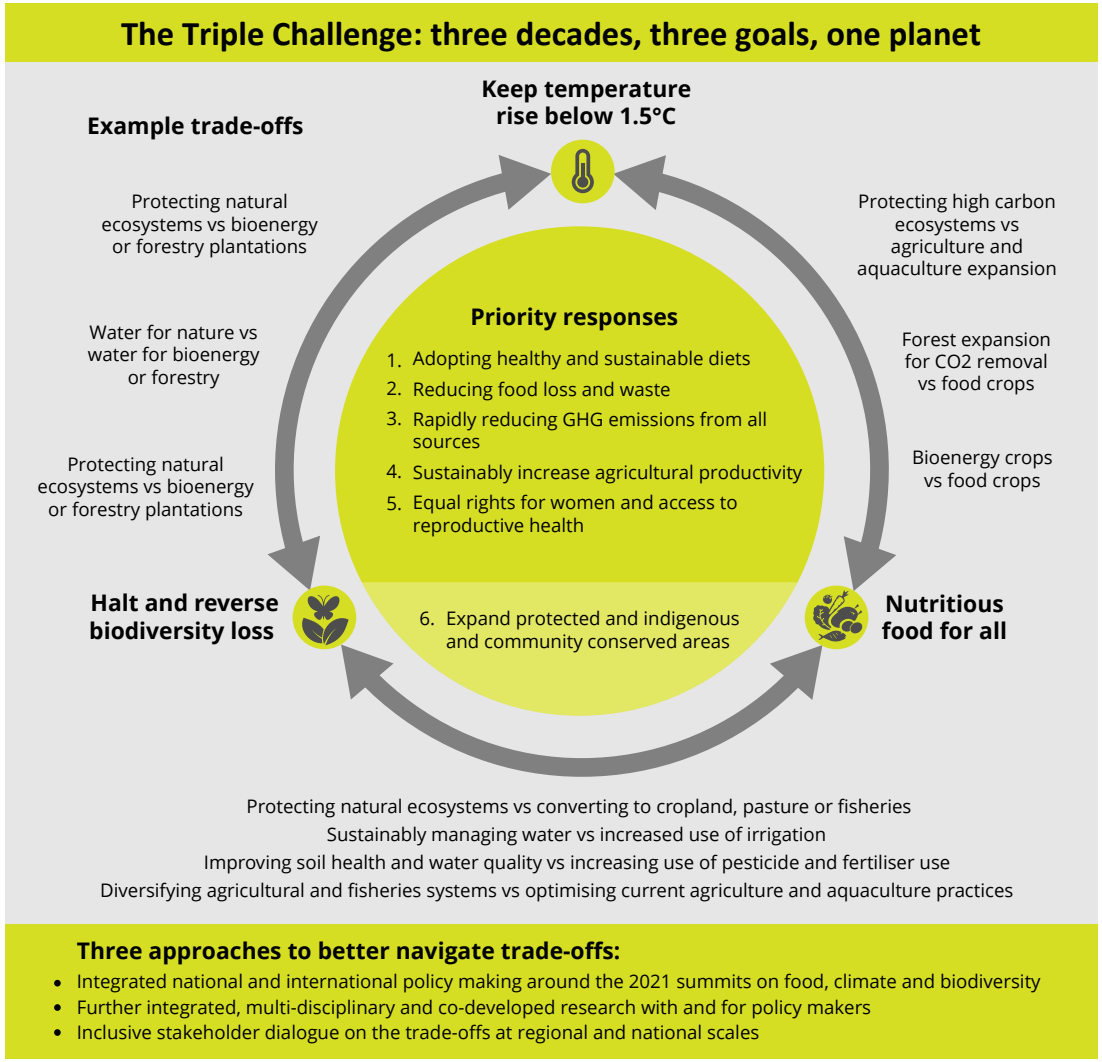
Priority policy and business responses

Through various international agreements, including the Sustainable Development Goals, there is broad agreement on where we want to end up (see Table 1). There are many different options for achieving each goal separately, but if we do not consider them together we increase the risk of trade-offs and perverse outcomes that will prevent us from meeting the triple challenge. For example, the IPCC scenarios demonstrate that the slower we reduce greenhouse gas emissions the more we will rely on carbon dioxide removal strategies including bioenergy with carbon capture and storage or the expansion of forests, both of which will affect land available for agriculture (IPCC 2019a). On the other hand, if hydropower is adopted at scale to switch to a lower carbon energy supply this has implications for freshwater habitat connectivity. We adopt a definition of trade-offs in this context as 'land-use [or water use, or sea use] or management choices that increase the delivery of one (or more) ecosystem service(s) at the expense of the delivery of other ecosystem services' (in Turkelboom et al 2018; derived from TEEB, 2010, UKNEA, 2011, Felipe-Lucia et al., 2015).

Table 1. International objectives on elements of the triple challenge.

Climate Change	Biodiversity	Food
Paris Agreement under the UNFCCC	Vision of the Strategic Plan 2011-2020, UN CBD	Sustainable Development Goals, target 2.1
...keep global temperature rise this century well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5°C.	By 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people.	By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round.

Insufficient national ambition and action on climate change and biodiversity is narrowing the window of opportunity to avoid or minimise trade-offs. In this context, it should be a political, economic and social priority to identify actions that deliver on all three goals of the triple challenge while also having the potential to reduce competition for land, water and sea resources. Four global assessments published in 2019 provide us with more knowledge than ever before on each goal: the IPBES Global Assessment on Ecosystems and Biodiversity, the IPCC reports on climate change and land, and climate change and the oceans and cryosphere, and the EAT Lancet commission on Food, Planet, Health. We synthesised the responses highlighted in these global assessments, and other literature reviews (Gardiner & Gulati 2017; FOLU 2019) and find that research is coalescing around a



small number of actions that can indeed deliver on all three goals while reducing competition, as shown in responses 1-5 in Figure 1.

For the first five actions enable land and sea ecosystems to be "spared" but do not ensure their protection or sustainable management directly. We, therefore, highlight a sixth action to expand protected areas and other effective conservation measures, essential for halting and reversing biodiversity loss (Allan et al 2019). Although this will also help reduce atmospheric carbon dioxide levels, and should be done with support from indigenous peoples and local communities, it is distinct from the first five actions in that it has important implications for land, water and sea use (Schleicher et al 2019).

Figure 1: The major trade-offs between actions to keep on a trajectory for global temperature rise below 1.5°C, reverse the loss of biodiversity and provide a healthy diet for the global population by 2050 (box), actions that reduce competition within and deliver on all three goals of the triple challenge (green), one further measure to ensure biodiversity benefits (light green), and three approaches that will be important for navigating the triple challenge (blue).

Navigating trade-offs

These five responses alone will not allow us to meet the triple challenge. Further measures will need to be adopted, and many imply trade-offs depending on how they are deployed and will require conscious policy choices between possible response pathways. Although there is valuable analysis pointing to global land optimisation strategies that may meet these multiple goals, these must be converted from theory to practice and compete with national interests (Heck at al 2019). We propose three approaches to help navigate these trade-offs:

1. Policy makers must take an integrated approach to climate, biodiversity and food, starting with national preparations for the three UN summits in 2021.

Policy makers must break out of their area of expertise and responsibility and work across the goals in the triple challenge. This will mean facing up to complexity, understanding trade-offs in their decision making and being transparent about their response to those. For example, being clear on the impacts for nature and climate of their food and farming strategy, and the trade-offs for nature and food of their intended energy mix, including hydro, bioenergy and other renewables, and on what basis they accepted these trade-offs. It will be necessary to create political space in which these trade-offs may be identified, understood, negotiated and then avoided, managed or accepted, on which see point 3 below for non-state actors.

In 2021, three UN conferences will be held on biodiversity (Convention on Biological Diversity COP 15), climate change (UN Framework Convention on Climate Change COP 26) and the Food Systems Summit. Before or after each summit governments are asked to communicate their national response, through Nationally Determined Contributions (NDCs) for climate change, National Biodiversity Strategies and Action Plans or a 'voluntary declaration' in the case of the food summit. This is an unprecedented opportunity to create a joined up set of actions. But the necessary integration is not taking place at the moment. For example, only around one quarter of NDCs include quantified actions on nature based solutions[4], and agriculture and climate change are scarcely present in the draft biodiversity framework despite being the greatest present and future threats to biodiversity. The Food Systems Summit is least developed but some reports indicate it will have a specific focus on trade-offs[5], creating an opening to build links with climate change and biodiversity. We propose to national governments the need for one integrated plan for all three goals: a national 'triple challenge strategy'.

Adopting the landscape approach will be an essential strategy[6]. At sub-national level, integrated and inclusive land, water and marine management and effective spatial planning have been highlighted as

4 https://www.undp.org/content/dam/LECB/docs/pubs-tools-facts/undp-ndcsp-pathway-for-increasing-nbs-in-ndcs-final.pdf Accessed 11/5/2020

5 https://sdg.iisd.org/events/2021-un-food-systems-summit/ Accessed 11/5/20

6 Landscape approach understood as: "balancing competing land use demands in a way that is best for human well-being and the environment. It means creating solutions that consider food and livelihoods, finance, rights, restoration and progress towards climate and development goals." https://www.globallandscapesforum.org/about/what-is-the-landscape-approach/ Accessed 13/5/20

critical to responding to the climate and biodiversity crises, and can help find balance with agriculture at the landscape level (IPBES 2019, IPCC 2019a). Indeed much of the triple challenge will materialise in formal or informal land and sea use planning. So sub-national policy should seek the same level of integration as recommended above for national and international policy to respond to the triple challenge within landscapes. The trade-offs and most appropriate responses will also vary between landscapes and therefore efficiencies gained through playing to the particular attributes of each landscape (e.g. more protection measures in relatively intact landscapes, while more developed landscapes prioritise production.) But in this context, incentives should align appropriately so that intact landscapes do not lose economically while fulfilling this part of an integrated strategy.

The same principle holds at international level, where open dialogue on the triple challenge is needed to support transboundary solutions, including sustainable trade, support for alternative economic pathways for countries with high coverage of intact ecosystems, growing the right crops in the right places. Narratives are emerging in the wake of COVID-19 in social and political discussion in support of national food self-sufficiency. This could hinder our ability to deliver on the triple challenge by restricting transboundary solutions, a risk that should be discussed at the three UN conferences and G20 summits. Success by 2050 will depend on national actions collectively amounting to enough global ambition to meet the three shared goals.

2. Researchers must further integrate their global analyses and provide tools that appeal to policy makers and can compare response options and highlight synergies and trade-offs.

At local or sub-national levels, there are good examples of integrated approaches and tools (e.g. FORLAND[7], systematic conservation planning). However, as outlined above, these do not appear to have been successful at encouraging integration in major national and international policy decisions. The aforementioned four major global assessments of 2019 only partially recognise the synergies and trade-offs across the triple challenge, and with notable exceptions (FOLU 2019, FABLE 2019) there is limited truly integrated analysis in these assessments and the body of research they draw on.

The research community must collaborate and think afresh about how to produce such an integrated picture in a way that senior politicians and global leaders will listen and use. Decisions affecting the triple challenge will always be at the mercy of the imperfections of political decision-making systems and to the power of vested interests. Decision-makers lack the time and knowledge to fully understand the full complexities of potential implications of their decisions, particularly in the context of dynamic complex systems in which feedback and interactions span multiple spatial and temporal scales, and all sectors of society. Regardless, to bring about transformational change to address the triple challenge, a prerequisite will be the development of improved approaches to openly identify and consider trade-offs incorporating all perspectives. This necessitates better connections between science and political processes, and societal discourses, and that scenarios and implications for trade-offs can be better understood.

7 https://forland.io/solutions/restoration/ Accessed 26/4/20

We encourage researchers to work in groups of mixed disciplines (including the social and political sciences) to this end, and to co-develop research with policy makers and end users. The IPBES and IPCC can lead by example in producing with urgency a strong and policy relevant integrated report in their next assessment cycle.

3. Non-state actors should be engaged in an open dialogue around the triple challenge and trade-offs, to lend their voice to selecting preferred pathways and increase willingness to adopt transformational change.

Within this global challenge there are national and local circumstances that will require different approaches. Although we focus on synergies and trade-offs within the triple challenge the choices between pathways come with broader political and economic consequences (e.g. loss of coal mining jobs when exiting fossil fuel use). Economic and social policies to pursue these options would also need to consider such consequences, including to support a just transition from, in this example, carbon intensive jobs to less carbon intensive jobs.

We propose stakeholder dialogues at national and landscape levels: 'triple challenge dialogues'. Participatory engagement is central to negotiating equitable trade-offs and there is a rich history of research on dialogue initiatives and participatory learning that can serve as guides (e.g. Brouwer et al 2016; ILO-ITUC 2016). Core principles for 'triple challenge dialogues' would include clarity of purpose, inclusiveness, transparency, accountability, application of sound science, connection to institutions with decision making power, and a commitment to building shared understanding of issues that will be seen from different perspectives. Such a dialogue could identify the most appropriate pathways, potential mitigating measures for negative impacts, and help to overcome resistance to change, thus increasing the chance that the resulting agreements and recommendations are implemented (Turkelboom et al 2018).

Conclusion

Over the last two years we have amassed a body of knowledge greater than ever before on the climate and biodiversity crises and the challenges facing our food system. Business as usual will lead to further health problems caused by poor diets, dangerous climate change and biodiversity collapse, in turn undermining our food security. The triple challenge highlights the urgent need for transformational cross-sectoral action: the slower we act the greater the trade-offs. Much of the solution is known, but trade-offs need to be understood, acknowledged and negotiated in pursuit of transformational change to our economy and society. Political leaders and policy makers, the research community, and wider civil society all have responsibilities in agreeing a route towards our agreed global goals on climate change, biodiversity and food. The international policy milestones in 2021 present an opportunity for governments and non-state actors to adopt actions commensurate with the scale of the challenge, and with the evidence base to produce integrated national and international plans, supported by multi-disciplinary research and influential stakeholder dialogue.

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