Supporting document – call 2021 for research programme on Multifunctionality at landscape level

Moving forward with the biodiversity agenda

Ecosystems and biodiversity are in rapid decline, which is undermining progress towards 80% of targets assessed for achieving SDGs relating to poverty, hunger, health, water, cities, climate, oceans and land[1] (IPBES 2019). Furthermore, none of the Convention on Biological Diversity's 20 Aichi Biodiversity targets for 2020 were fully met, meaning that current work to mitigate and reverse biodiversity loss is insufficient.

Whilst conditions and priorities depend on local context, some general observations can be made about the approaches moving forward with the biodiversity agenda. The Aichi targets set benchmarks for increased ambition in regard to five key areas: drivers, pressures, the state of biodiversity, the benefits derived from biodiversity and the implementation of relevant policies and enabling conditions (CBD 2020). These benchmarks highlight particular areas for targeting future measures. Substantial changes and innovations are needed within a short timescale which involve and encourage greater interaction between a wide range of stakeholders across all sectors and scales (CBD 2020). The time aspect is crucial, with studies showing that preventative measures are three times cheaper than delayed measures. Furthermore, the benefits of restoration are often ten times greater than the costs and there is high, and often non-recognised, added value in job opportunities, increasing business investments and improved gender equality (Ebenhard *et al.* 2021). Efforts need to be integrated over various spatial and temporal scales in order to foster a holistic view. The holistic, or systemic approach, makes potential synergies and conflicts between objectives perceptible, including other sustainability goals such as climate change, supporting appropriate action (Bergström 2020). Furthermore, actions need to consider the knowledge, practices, institutions and values of indigenous peoples and local communities to strengthen their roles; integrate gender considerations; adopt adaptive management and learning through facilitating technical and scientific cooperation; reduce time lags in implementation; and undertake regular reviews (IPBES 2019; CBD 2020).

These factors are resulting in more calls for transformative change across economic, social, political and technological factors to address biodiversity loss. Transformative change is defined as a "fundamental, system-wide reorganisation across technological, economic and social factors, including paradigms, goals and values" (IPBES 2019) and stems from a recognition that we need to significantly

[1] SDGs 1, 2, 3, 6, 11, 13, 14 and 15

depart from existing trajectories if we are to meet current goals for biodiversity and climate change (Bergström 2020). The scale of these changes has been likened to that of the Marshall Plan in terms of the level of ambition, coordination and political will required (Dasgupta 2021). In the context of biodiversity, it has been applied to production and consumption patterns, particularly in relation to food (agricultural methods, diets, food waste), but also forestry, energy and freshwater use (CBD 2020). It even encompasses ways of measuring economic success and institution and system design, especially financial and educational systems (Dasgupta 2021).

Transformative change occurs through targeting levers such as incentives and capacity-building, cross-sectoral cooperation, pre-emptive action, decision-making in the context of resilience and uncertainty, and environmental law and implementation (IPBES 2019). It is directed towards visions of a good life; total consumption and waste; values and action; inequalities; justice and inclusion in conservation; externalities and telecoupling; technology, innovation and investment; and education and knowledge generation and sharing(IPBES 2019). Transformative change is underpinned by examples of progress, varying across particular contexts, which if scaled up could support the transition necessary to achieve currents visions and goals(IPBES 2019).

Threats and drivers of biodiversity loss

Current trajectories suggest that biodiversity decline threatens the sustainability of species and ecosystem functions and create losses valued at 10% of global GDP (IPBES 2019; Ebenhard *et al.* 2021). Biodiversity loss is expected to erode the resilience of agricultural systems to threats including pests, pathogens and climate change, reducing agricultural yields substantially and making communities more socioeconomically vulnerable (IPBES 2019). Dryer regions have already experienced a significant increase in the number of violent conflicts during years of extremely low rainfall, which is expected to rise. Additionally, 50-700 million people are predicted to flee their lands and seek refuge elsewhere. This risks loss of cultural identity as well as the knowledge and customs that many communities possess which may be able to help reduce and reverse currents trends in degradation (Ebenhard *et al.* 2021). In sum, the world's most poor and vulnerable, including indigenous peoples and local communities, are expected to face the harshest consequences of biodiversity loss. This is both due to their reliance on biodiversity for wellbeing and because they inhabit areas most at risk (CBD 2020). However, this also means that vulnerable groups will benefit most from the reduction and reversal of current trends (Ebenhard *et al.* 2021).

Direct drivers of biodiversity loss are numerous. The largest current impact on biodiversity loss comes from changing use of land and sea resources, i.e. the rapid and widespread conversion of natural areas to unsustainably managed pastures and cropland (IPBES 2019; Ebenhard *et al.* 2021). The second largest impact (and the largest impact on marine ecosystems) comes from overexploitation of extractive industries such as fishing, harvesting, logging and hunting (IPBES

2019). Other direct drivers of biodiversity loss include pollution, invasive alien species, urbanisation, infrastructure development and climate change (CBD 2020), (Ebenhard *et al.* 2021). Climate change is a critical and unique driver as it exacerbates the impacts of almost all other drivers on natural systems. This includes extreme weather's impact on erosion, increased risk of forest fires, and changes in the distribution of pathogens and invasive species. Not only does climate change drive land degradation but is also driven by land degradation itself, creating a reinforcing effect that can significantly worsen conditions for taking action against biodiversity loss (Ebenhard *et al.* 2021). Unfortunately, the impacts of climate change are expected to increase in coming decades (IPBES 2019).
Indirect drivers of biodiversity loss are those which underpin the direct drivers of change. The most significant global indirect driver is high consumption per capita, particularly in the global north (Ebenhard *et al.* 2021). This growing demand for energy and materials is spurred by increasing access to global markets and technological developments, which has reduced the price of land-intense goods, which is multiplied by population growth (Ebenhard *et al.* 2021). The globalised economy has also allowed unsustainable land-use practices to move to places with weaker environmental legislation (Ebenhard *et al.* 2021). These causes are rarely recognised, but even when made, the relevant consequences and appropriate responses are often overlooked (Ebenhard *et al.* 2021). Lack of awareness of the problems relating to biodiversity loss is another key indirect driver of current decline. The distance between producers and consumers and delay effects in environmental change masks the consequences of economic activities (Ebenhard *et al.* 2021). As a result, those who gain the most under current circumstances, often loose least in terms of degradation and have limited incentives to change their practices (Ebenhard *et al.* 2021). Direct and indirect drivers of biodiversity alike are increasing and, with that, their consequent impacts upon ecosystem decline (IPBES 2019; CBD 2020). However, drivers also represent levers towards which policy measures can be directed in order to abate their effects and slow, stop and reverse current trends in biodiversity loss.

Current measures addressing biodiversity loss

Increased ambition must tackle both direct and indirect drivers of biodiversity loss and ecosystem decline. Numerous techniques and approaches have been proposed in order to limit the negative effects arising from land-use change. For example, changes in land-use methods and production and consumption patterns, relating to food sorts as well as other material goods that directly impact on biodiversity such as forestry, energy and freshwater use (CBD 2020; Ebenhard *et al.* 2021). Regarding climate change, restoration and reduced or avoided degradation is a clear opportunity for increased carbon storage and emissions avoidance. However, care must be taken to avoid conflicts between goals, such as the negative side effects of large-scale bioenergy plantations or afforestation of non-forest ecosystems on biodiversity and ecosystem functioning (Bergström 2020; Ebenhard *et al.* 2021). Whilst many potential synergies exist between addressing biodiversity loss and climate change, these must be consciously designed and planned for using a landscape approach (Bergström 2020).

In terms of indirect drivers, measures to address economic drivers such as high consumption include internalising the multiple values of nature and its contributions to humanity as well as the costs of degradation in the price of products (IPBES 2019; Ebenhard *et al.* 2021); removing legislation with perverse incentives; and establishing a global sustainable economy steering away from the current, limited paradigm of economic growth (IPBES 2019). Regarding problem awareness, decisions makers, land users and consumers need easy access to credible and relevant information about biodiversity loss and ecosystem decline, including life-cycle information of goods (Ebenhard *et al.* 2021).

Various examples lead the way in efforts to tackle biodiversity loss. One such initiative is the Man and the Biosphere (MAB) Program and its World Network of Biosphere Reserves. The MAB Program commenced in 1971 as an intergovernmental scientific programme seeking to establish a scientific basis for enhancing relationships between people and the biosphere (https://en.unesco.org/mab). As a part of this work, in 1976, the World Network of Biosphere Reserves was created which now consists of 701 sites in 124 countries, of which Sweden currently has seven sites (https://biosfarprogrammet.se). According to UNESCO, biosphere reverses are areas for experimenting and learning in order to better manage biodiversity, prevent conflicts and promote sustainable development. These are hence model areas which can be replicated in other contexts (https://en.unesco.org/mab). However, practitioners and researchers consider biosphere reserves to fulfil numerous additional roles. These include serving as a neutral arena to manage and resolve local environmental conflicts between interest groups; educating and communicating the importance of biosphere reserves and sustainable development to local communities; serving as trademarks of sustainable development to further communicate this message to a wider public, including tourists; and as a way to implement agenda 2030 (Sandström & Sahlström 2020). As a result, biosphere reserves have been the subject of much research, especially in relation to resilience and adaptive governance with the hope of developing approaches to be applied and scaled up to further action on limiting biodiversity loss (Sandström & Sahlström 2020).

Another leading example is the ecosystem approach, a strategy for integrated management of land, water and living resources that promotes conservation and sustainable use of resources in a fair and just way. It is based on the application of appropriate scientific methods aimed at all levels of biodiversity, including essential processes, functions and interactions between organisms and their

environment. The ecosystem approach includes humanity, with its cultural diversity, as an integral part of ecosystems[2].

Establishing structures for participatory learning and management on biodiversity as a base for implementing Agenda 2030

Slowing, halting and reversing biodiversity loss and ecosystem decline goes hand in hand with implementing Agenda 2030. Not only is biodiversity an explicit component of many Sustainable Development Goals, but acting on biodiversity loss will address many mutual drivers of other societal challenges and thus help achieve numerous other goals, such as climate change (SDG 13), pollution (SDGs 6, 12 and 14) and overexploitation (SDGs 6, 12, 14, 15). It will address unsustainable production and consumption patterns, support a more efficient use of natural resources and reduce food waste (SDG 12). Furthermore, it will improve the underlying conditions for improving institutions and human capital (SDGs 3, 4, 16), gender equality (SDG 5) and reducing inequality (SDG 10). Few trade-offs exist between taking action on biodiversity and implementing Agenda 2030 and where these occur, they can be mitigated or avoided through coherent and integrated policy measures (CBD 2020). Furthermore, slowing, stopping and reversing biodiversity loss and ecosystem decline is critical for other global goals such as those outlined in the Paris Agreement as up to one-third of emissions reductions required to meet the commitments of the Paris Agreement could come from nature-based solutions (CBD 2020).

It is not too late to depart from current trends and slow, stop and reverse the current decline in biodiversity and ecosystem health. Examples such as the Man and the Biosphere program and the Ecosystem approach highlight the role of participatory learning methods and integrated management in finding alternative, more sustainable pathways forward in the biodiversity agenda. Through small-scale experimenting and learning from management practices, these examples can serve as a basis for implementing transformative change through scaling their positive qualities and impacts. Immediate and comprehensive measures to address biodiversity loss will improve human wellbeing, be more cost efficient than subsequent measures and synergise with progress on numerous other sustainability goals.

References

[2] https://www.cbd.int/ecosystem/ and The Ecosystem Approach Advanced User Guide: https://www.cbd.int/ecosystem/sourcebook/advanced-guide/

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