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Climate and Biodiversity Conferences: New Initiatives and Ecological Realities

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Two international conferences in late 2022 developed new responses to global climate and ecological crises. The United Nations Climate Change Conference known as COP27 (or 27th Conference of the Parties) took place in Sharm-El-Sheik, Egypt, in November 2022; in December 2022 the 15th Conference of the Parties to the UN Convention on Biological Diversity (COP15) met in Montréal, Canada.[1] They addressed different aspects of worsening global crises: the disruption of the planetary climate system due to greenhouse gas emissions, and the intensifying loss of biodiversity. Both crises arise from pressures associated with population and economic growth, and responses to both will be fundamental to determining the future course of human development in the twenty-first century and beyond.

Throughout 2022, extreme weather events and disasters affected almost all regions of the planet.[2] Flooding, heatwaves, wildfires, droughts, floods and hurricanes affected many areas including Pakistan, China, Europe and the US. According to the Intergovernmental Panel on Climate Change, the increased incidence of extreme weather events, as well as a general increasing trend in global temperature, are clearly linked to emissions from human activities, and all can be expected to worsen if emissions continue on current trends.[3]

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At the same time, the world has suffered major damage to ecosystems resulting from human impacts: "Humans, their crops, and their food animals take up an increasing share of Earth's land area. Half of the world's habitable land has been converted to agriculture; about 77 percent of agricultural land is used for grazing by cattle, sheep, goats, and other livestock.

"This conversion of forests, wetlands, grasslands, and other terrestrial ecosystems has produced a 60 percent decline in the number of vertebrates worldwide since 1970. Between 1970 and 2014 the human population grew from about 3.7 billion to 7.3 billion people [8 billion by 2022]. By 2018 the biomass of humans and their livestock greatly outweighed the biomass of wild mammals and wild birds, by a factor of about 16 to 1. Researchers estimate that the current rate of species loss varies between 100 and 10,000 times the background [natural] extinction rate. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, up to one million plant and animal species are facing extinction due to human activities."[4]

From the perspective of ecological economics, these two crises are interrelated, and reflect the fundamental conflict between traditional economic growth and the planetary ecosystem. Ecological economics has long emphasized the limits that ecosystem realities impose on economic systems. When economic systems, heavily reliant on energy and natural resource inputs, expand into the closed planetary system, they put excessive pressure on natural cycles including the carbon cycle and other life support systems including the complex web of biological and species interactions. The human population of 8 billion people, more than double what it was fifty years ago, accompanied by a fourfold increase in economic output and more than doubling of carbon emissions over the same period, have unbalanced climate and ecological systems, endangering the ability of the planet to support life. To respond to the resulting crises, a far-reaching change in the nature of economic activity is required.

Given the scope of the challenges, the climate and biodiversity conferences sponsored by the United Nations represent a very modest start in terms of policy responses. The two conferences were only the latest in a long series of international meetings attempting to address the crises, and their outcomes are a long way from what is needed to resolve the issues, often being heavy on statements of intent and light on enforceable commitments. But at least they constitute an attempt to respond to these pressing issues.

One of the central theoretical premises of ecological economics is that market systems lack an effective feedback mechanism to deal with ecological problems. So long as an unregulated market logic prevails, the issues of climate change and biodiversity loss will simply keep getting worse, since economic actors lack any incentive to change their behavior. National policies can have some effect, but since the problems are global in nature a coordinated international response is essential.

For this reason it is important to evaluate the results of Climate COP27 and Biodiversity COP15. They provide a potential basis for national policies as well as international institutions that can guide economies on to a more sustainable path. Notably, at both conferences the importance of natural systems gained much more attention than in the past. Clearly, modification of industrial production to reduce emissions and protect biodiversity is crucial, but this must take place in the context of protecting and expanding healthy natural systems that can both absorb and store carbon and promote ecological integrity.

Outcomes of Climate COP27

A specific item of progress at COP27 was agreement on a "loss and damage" fund to compensate lower-income countries for damages from climate change. According to a Reuters article, "The deal was widely lauded as a triumph for responding to the devastating impact that global warming is already having on vulnerable countries. But many countries said they felt pressured to give up on tougher commitments for limiting global warming to 1.5 degrees Celsius in order for the landmark deal on the loss and damage fund to go through."[5]

At the 2021 COP26 conference in Glasgow, UK, countries committed to strengthening their Nationally Determined Contributions, or pledges to reduce greenhouse gas emissions, first agreed at the COP 21 climate conference in Paris in 2015. But results so far are limited, and well short of what is needed to limit the global temperature increase to 1.5°C, or even 2°C. According to the independent Climate Action Tracker, only a few countries are in the category of "almost sufficient", while most are rated "insufficient" or "highly insufficient." Clearly, faster reduction of emissions is essential. But even if this is achieved, it is very unlikely that global goals will be met without a significant increase in carbon absorption by natural systems. COP27 failed to achieve significant strengthening of the NDCs, leaving a major gap between current pledges and needed reductions.

Africa was a specific focus for the Sharm-El-Sheik conference. At the Africa Adaptation Leaders' Event, global leaders emphasized the importance of climate adaptation in Africa and committed to providing funding for the Africa Adaptation Acceleration Program (AAAP). The AAAP is an Africa-owned and Africa-led initiative developed by the Global Center on Adaptation and the African Development Bank, in partnership with the African Union, that aims to mobilize $25 billion to implement, scale, and accelerate climate adaptation across Africa. Since 2021, the AAAP has mainstreamed climate adaptation in over $3.5 billion of investments in 19 countries. The United Kingdom, Netherlands, and Norway, among others, announced financial contributions to the AAAP, with the UK providing £200 million to the African Development Bank's Climate Action Window and the Netherlands contributing EUR 110 million to the AAAP.

Agriculture and Forestry

The role of agriculture in climate change received unprecedented attention at COP27, and featured in the "cover decision" along with forests and other natural systems. Reforming agriculture and food systems – currently responsible for one-third of all greenhouse gas emissions – will be essential to achieving the global goal of limiting warming to below 1.5 degrees.

According to the United Nations Climate and Environment News, "small-scale farmers from developing countries produce one-third of the world's food, yet they only receive 1.7 per cent of climate finance even as they are forced to cope with droughts, floods, cyclones and other disasters." Protecting the capacity of the global food system to feed a growing population requires improving the resilience of food systems to inevitable climate impacts. At the same time, there is enormous potential for carbon storage through regenerative agricultural systems and the promotion of such systems must be a key part of climate policy.

The Koronivia Joint Work on Agriculture, adopted at COP23 in 2017, recognizes the unique potential of agriculture in tackling climate change and seeks to "mainstream agriculture into the UN Framework Convention on Climate Change (UNFCCCC) process." COP27 reaffirmed the Koronivia process, renewing it for another four years.

At COP26 in 2021, the Glasgow Declaration on Forests and Land Use, signed by 145 countries representing 90 percent of the world's forested land, pledged to end deforestation by 2030. In a separate pledge for global forest finance, 12 countries, including the US and EU, promised to provide $12 billion for forest-related climate finance between 2021-2025. COP27 expanded the Glasgow commitments with a pledge by a group of 26 countries representing a third of the world's forests to "track commitments" on efforts to "halt and reverse forest loss by 2030".

The Forests and Climate Leaders' Partnership (FCLP) brings together 26 countries and the EU to halt and reverse forest loss and land degradation by 2030. The partnership will be co-chaired by the USA and Ghana, and will focus on areas such as international collaboration on sustainable land use economy, mobilizing public and private finance, supporting Indigenous Peoples' and local communities' initiatives, strengthening and scaling carbon markets for forests, and establishing partnerships and incentives for preserving forests. Major forested countries, however, declined to join this new pledge, including the Democratic Republic of the Congo, Brazil, Russia, China and Peru, which together account for nearly half of the world's forests. This leaves effective implementation of forests preservation pledges still in doubt.

A controversial measure to help preserve forests is the use of carbon offsets or credits, which can provide funding for forest preservation. Under Article 6 of the 2015 Paris Agreement, countries can trade carbon credits. "COP27 set a timeline to implement all parts of Article 6 of the Paris agreement, which regulates carbon trading between the parties, as well as non-market investment in conservation. Also included in those

decisions is a verification mechanism that could see countries sell "sovereign carbon credits" for preserving ecosystems."[6]

While funds for forest preservation would be welcome, critics fear the commodification of forests and the use of dubious offsets that allow continued carbon emissions while not achieving significant forest conservation. "'It is too optimistic to say that this is a victory for forests,' said Diego Pacheco Balanza, Bolivia's lead negotiator and a key voice on Article 6. 'We are opening several venues for supporting forests financially to help keep them alive, but those are resisted by developed countries. They only want to push the commodification of forests, which of course is a fatal scenario.'"[7] The use of the "net zero" concept to allow continued industrial emissions while failing to provide an accurate accounting of different forest management impacts can understate the true value and potential of forests as natural carbon sinks.[8]

Outcomes of Biodiversity COP15

At the 2022 Montréal conference, almost 200 countries agreed to a new set of goals and targets to "halt and reverse" biodiversity loss by the end of the decade. "Observers hope that a strengthened mission, measurable targets and an "enhanced implementation mechanism" mean that the Kunming-Montreal Global Biodiversity Framework (GBF), as it is formally known, will succeed where its predecessor, the Aichi targets agreed at COP10 in 2010, did not." [9]

The conference adopted a goal of "30×30" – conserving 30% of the world's land and 30% of the ocean by 2030. A second "30×30" goal commits developed countries to mobilize $30bn for developing countries to conserve biodiversity by 2030. These commitments are not legally binding. But in an arrangement similar to the 2015 Paris Agreement for climate change, countries have agreed to a plan to report on, review and voluntarily "ratchet up" their ambitions for tackling biodiversity loss.

The conference focused specifically on the impact of agricultural systems, finding that "current food systems" – a term which encompasses activities related to food production, transport, processing and consumption – are major drivers of biodiversity loss, land degradation and climate change. According to a 2022 study from the UN Convention to Combat Desertification, food systems account for 80% of deforestation and 29% of greenhouse gas emissions globally. Food systems are also thought to drive about 70% of terrestrial biodiversity loss and 50% of marine biodiversity loss, according to the 2020 WWF Living Planet Report".[10]

One of the targets adopted by the conference was to "ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems."[11] Thus reform of agricultural practices is seen as an essential element of biodiversity conservation.

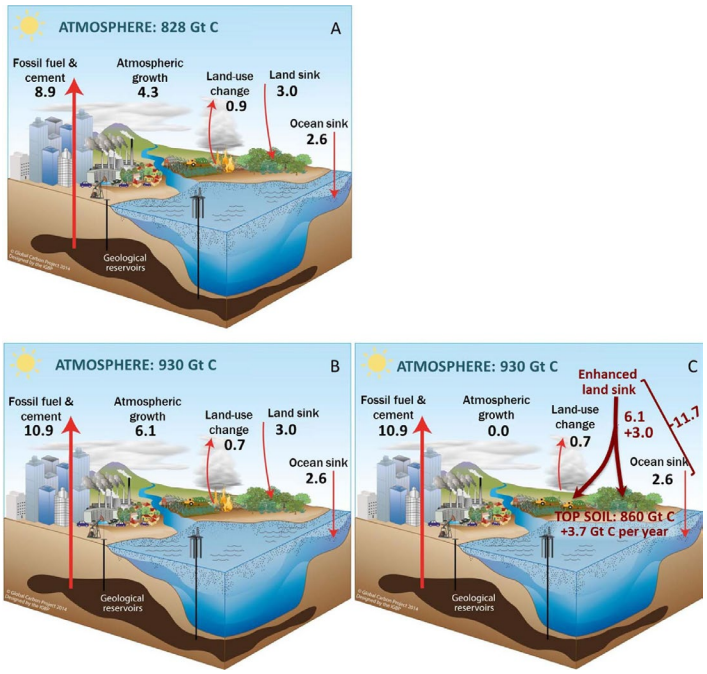
Filling the climate policy gap

The potential for carbon absorption by agricultural soils, wetlands and forests is very large. Global vegetation currently acts as a carbon sink, absorbing about 2.9 Gigatons of carbon (Gt, or billion tons) per year. The world's soils currently store more carbon than the atmosphere, and the top layer of soil contains about 860 Gt of carbon. According to the International "4 per 1000" Initiative, an independent effort linked to the COP process, increasing this soil carbon storage by four-tenths of one percent per year (0.004) would store about over 3 Gt annually.

At the same time, promoting additional carbon storage in forests and wetlands by preventing deforestation, allowing current second-growth forests to reach maturity, and restoring degraded and deforested lands, could store up to an additional 5 Gt of carbon per year.[12] In theory, achieving these goals, together with reducing current industrial emissions, could result in *negative* annual carbon emissions, reducing the total level of atmospheric carbon accumulations over time.

Figure 1 depicts carbon flows into and out of the atmosphere. Figure 1A shows emissions as of 2011, with a net carbon flow to the atmosphere of 4.3 gigatons of carbon. Figure 1B shows the situation during the period 2030-2040, assuming that countries fully comply with their Paris Agreement commitments, but without any action on enhancing carbon sinks in soils and forests. Figure 1C shows the potential contribution of enhanced natural absorption of carbon.

Figure 1. Global Carbon Cycle With and Without Natural Climate Solutions



Source: Soussana et al., 2017.

The difference is dramatic. In Figure 1B we see that 10.9 Gt C would be released every year from fossil fuel and cement usage, an increase of approximately 2 Gt C from 2011. In this scenario, emissions would increase by 1.8 gigatons, ocean sinks would absorb 2.6 Gt, while land and biomass sinks would absorb 3Gt (unchanged from 2011), leading to a net atmospheric growth of 6.1 Gt C annually. Despite the Paris Agreement efforts, *more* carbon would be added to the atmosphere each year.

But in Figure 1C, with a theoretical maximum of an additional 3.7 Gt C per year being absorbed by the world's soils, and an additional 2.4 Gt C absorbed by forests and ecosystems, the additional "land sink" absorption of 6.1 Gt C means that net atmospheric increase falls to zero in 2030-2040. This scenario assumes full implementation of the "4 per 1000" soil initiative as well as comprehensive forest protection and reforestation.

The world is very far from achieving these carbon storage levels. Currently, agriculture is a major *source*, not sink, for emissions, accounting for about 18 percent of total greenhouse gas emissions. And global forests are being lost at a rate of about 10 million hectares per year. Thus the initial efforts on agriculture and forests adopted at Climate COP27 and Biodiversity COP15 are an essential start on what must become a much more central focus of global climate policy.

Reorienting the global economy towards compatibility with natural systems

The focus of previous climate conferences has been on reducing industrial emissions, an essential goal. But the increased awareness of the importance of natural systems at these two recent conferences suggests a broader goal of reforming economic activity to be consistent with ecological sustainability—something that ecological economists have long advocated. Excessive accumulation of carbon in the atmosphere is only one symptom of the current incompatibility of human and natural systems. As the biodiversity conference made clear, there are numerous other ways in which current economic systems undermine the life support systems of the planet.

It will be essential for future conferences and country actions to fill the gap between current commitments and critical climate and biodiversity goals. The conference outcomes included greater prominence for natural solutions including soils, forests and wetlands. But it is essential for participating countries to move beyond broad statements to specific policies that reform agricultural, forestry, and industrial systems on a broad scale both to maximize carbon storage in agricultural soils and natural ecosystems, and also to preserve the integrity of the planet's life-support systems and biodiversity.

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[1] "COP" stands for "Conference of the Parties", referring to the countries that are parties to the original agreements. Almost all the world's countries are parties to the U.N. Framework Convention on Climate Change, and most – but not the United States – are parties to the Convention on Biological Diversity. The United States was an observer at the Biodiversity conference, since the U.S. Senate has never ratified the treaty.

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