

**WORKING
PAPER**

**CIRCULAR ECONOMY
AND
BIODIVERSITY**



GACERE
Global Alliance on
Circular Economy and
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This document is a concise paper offering relevant facts and figures, and arguments outlining key benefits of the circular economy to address planetary crises or a sustainable development challenge. It is a knowledge product, part of the toolbox, which members of the Global Alliance on Circular Economy and Resource Efficiency (GACERE) have developed, to support their advocacy at political level and multilateral for a for transitioning towards a circular economy. It is not a negotiated document and as such it does not necessarily represent the views of all GACERE members. Furthermore, it does not, nor is it intended to, create any binding, legal or financial obligations under international or domestic law.

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The present document explores the nexus between circular economy and biodiversity through the two dimensions of restore and regenerate. The paper offers insights on:

- how circular approaches can help avoid biodiversity loss and restore ecosystems, for the reliable delivery of ecosystem services and for planetary well-being.
- how circularity can inspire regenerative solutions for biodiversity recovery.

The potential of circular economy in addressing the biodiversity crisis remains largely untapped. The connections between the circular economy and biodiversity agendas have also not yet been extensively explored in existing literature. Despite initial research on sustainable forest management for example, little evidence is available on how countries and businesses have leveraged circular policies and practices in other sectors in view of preserving nature.

We are confronted with three interrelated environmental crises:



The report *Making Peace with Nature*¹ highlights that **transforming our social and economic systems requires improving our relationship with nature, understanding its value and putting that value at the heart of our decision-making.**

The pace of species extinction, global warming, the growing number of extreme weather events and zoonotic diseases like Covid-19, have further reinforced the need to invest in sustainable action that enhances the resilience of ecosystems and addresses societal challenges, such as food security, climate change, water security, human health and enhanced resilience to disaster risk.²

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Facts and figures

Biodiversity is declining faster than at any time in human history

- ❖ We are using the **equivalent of 1.6 Earths** to maintain our current consumption and production patterns³, and ecosystems cannot keep up with our demands. While nature has an extraordinary capacity for renewal, some ecosystems are approaching tipping points from which they cannot recover, many others can flourish again if we stop the damage and restore their health, biodiversity and productivity.⁴
- ❖ In less than half a century we have witnessed the disappearance of about **half of Earth's forests and one million animal and plant species** are threatened with extinction.⁵
- ❖ **Two-thirds of our marine life** is under threat from plastic pollution and overfishing, and global recorded populations of animals, mammals, birds, fish, amphibians and reptiles have fallen by 68 % over the last half century.⁶
- ❖ Between 2001 and 2015, 26% of global tree cover loss was caused by the production of just seven agricultural commodities – cattle, palm oil, soy, cocoa, rubber, coffee and plantation wood fibre.⁷
- ❖ This loss of diversity, including genetic diversity, poses a **serious risk to global food security** by undermining the resilience of many agricultural systems to threats such as pests, pathogens and climate change. Fewer and fewer varieties and breeds of plants and animals are being cultivated, raised, traded and maintained around the world, despite many local efforts, which include those by Indigenous peoples and local communities.
- ❖ Much of the world's terrestrial wild and domesticated biodiversity lies in areas traditionally managed, owned, used or occupied by indigenous peoples and local communities. In spite of efforts at all levels, although nature on indigenous lands is declining less rapidly than elsewhere, **biodiversity and the knowledge associated with its management are still deteriorating**.⁸
- ❖ **By 2050, up to 5 billion people face higher water pollution and insufficient pollination for nutrition** under future scenarios of land use and climate change, particularly in Africa and South Asia. Hundreds of millions of people face heightened coastal risk across Africa, Eurasia, and the Americas.⁹

The biodiversity crisis does not only threaten our environment, but also our society and global economy:

- ❖ Society and the economy are built upon the stability of the biosphere. We however operate in an economy that does not recognise how much we rely on biodiversity, such as for human health and well-being, food and medicine, and climate resilience, among many other things. ILO estimates that 1.2 billion jobs rely on effective management and sustainability of ecosystems.¹⁰
- ❖ 70% of people living in poverty depend on natural resources for their livelihoods.¹¹ Environmental decline affects and concerns everyone, rich and poor. Environmental pressures disproportionately affect the health of vulnerable and disadvantaged groups. The young, the elderly, women, people living in poverty and or with chronic health conditions, indigenous people and those targeted by racial profiling are some of the groups whose health is most vulnerable to the impacts of environmental decline.¹²
- ❖ High-income countries, representing one-third of the global population, have material consumption footprints that are 60% higher than middle-income countries, and thirteen times the level of low-income countries.¹³
- ❖ Our collective failure to date to understand that nature underpins our global economic system and take action to sustain nature will increasingly lead to financial losses. Biodiversity loss is already costing the global economy 10% of its output each year.¹⁴ All businesses depend on natural capital assets and ecosystem services either directly or through their supply chains ; more than half of the world's total GDP is moderately or highly dependent on nature and its services.¹⁵ Agriculture, food and beverages and construction are the largest sectors that are dependent on nature and these generate USD 8 trillion in gross value added.¹⁶ However, nature currently only accounts for 2.5% of projected economic stimulus spending in the wake of Covid-19.¹⁷
- ❖ Whilst the global economy has historically increased outputs from agriculture, fisheries and bioenergy, other benefits from nature to people (i.e. regulating and non-material contributions) generally declined.¹⁸

Drivers of biodiversity loss include:

- ❖ Land use change has had the largest relative negative impact since 1970 on terrestrial and freshwater ecosystems.¹⁹ The cultivation and processing of biomass is now responsible for almost 90 per cent of global water stress and land-use related biodiversity loss.²⁰
- ❖ Greenhouse gas emissions, unsound management of chemicals and waste, oil spills and toxic dumping have had strong negative effects on soil, freshwater and marine water quality and on the global atmosphere. For instance, informal or poorly regulated artisanal and small-scale gold mining, often using mercury and occurring in the protected areas, causes land degradation and deforestation. Organic and nutrient enrichment related to sewage and industrial discharges and land run-off have led to increases in hypoxic (“dead”) zones in both marine and freshwater ecosystems in the last 50 years.²¹

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Embedding the restore & regenerate dimensions into circularity can help reduce pressures on biodiversity and has the potential to inspire innovative solutions which encourage regenerative cycles of nature.

The regenerative and restorative dimensions of the circular economy through the processes of **restoring** and **regenerating** have often been overlooked in national policy frameworks and business practices, and yet they have a key role to play for addressing biodiversity loss drivers and increasing positive impacts on ecosystems.²²

Circular economy helps restore biodiversity as it promotes a more efficient use of natural resources.

Moving away from linear economic patterns, circular economy offers an alternative economic model, whereby natural resources are kept at their highest value, for as long as possible. Value retention processes embedded in the circular economy concept (i.e., rethink, refuse, reuse, repair, refurbish, remanufacture, repurpose, recycle²³) help reduce negative impacts on the biodiversity, as they require less resources and help better manage pollutants and waste. Adopting circular thinking has the potential, not only to slow and eventually halt biodiversity loss, but also reverse its decline, by restoring ecosystems and rebuilding natural capital, working with natural cycles to maintain the stock of natural capital and allow the regeneration of the biosphere – hence creating more resilience and sustainability.

Biodiversity Economy (or “Wildlife Economy”)

The Biodiversity Economy (or “Wildlife Economy”), which is an approach applied in South Africa, has a role to play both in the areas of biodiversity compatible land uses and also in the areas of biodiversity conservation and circular economy. The Wildlife Economy in South Africa is centred on the sustainable utilisation of indigenous biological resources including biodiversity-derived products for trade and bio-prospecting, the hunting industry, agriculture and agro-processing of indigenous crops and vegetables and livestock breeds and indigenous marine resources and fisheries. Wildlife Economy focus areas centred on the socio-economic benefits of eco-tourism, co-managed conservation areas and ancillary services to protected areas.

Sustainable use of indigenous resources is a key principle of the biodiversity economy. The biodiversity economy aims to grow while assuring the sustainability of the indigenous biological/genetic resources which are exploited and the conservation of the ecosystem within which the resources are found. This underlying principle is fundamentally aligned to notions of biodiversity friendly land use and biodiversity conservation. Specifically, practices which encourage regeneration of natural ecosystems in which indigenous biological/genetic resources are found are favoured.

Going beyond the more efficient use of natural resources, it is critical to value the ecosystem services. A circular economy relies on renewable natural resources and ecosystems services which are provided by the regenerative cycle of nature, such as flows of water, pollination and natural pest control services, and reduced vulnerability to natural hazards. Circular economy approaches which invest in the regenerative cycle of nature can create virtuous circles whereby ecosystems and their functions and services are restored, rehabilitated and land-use change is avoided through resource efficiency, policy development and planning, reducing, avoiding and reworking the use and management of chemicals and waste.

However, some nature-based approaches which aim at restoring biodiversity could risk further degrading nature, rather than supporting it. For example, the planting of non-native, monoculture forests may be prioritized over other approaches that could deliver more carbon sequestration and biodiversity-supporting habitats.²⁴

Circular solutions can inspire regenerative models for biodiversity.

Regenerative production can create the conditions to allow below- and aboveground biodiversity to prosper within and beyond managed areas, securing the long-term provision of critical ecosystem services on which society relies (e.g., the provision of food and clean water, flood protection, and nutrient cycling) and preventing land degradation.²⁵

Regenerative circular models focus on solutions designed within existing land uses to increase the biophysical function and/or ecological productivity of an ecosystem or its components including specific nature-derived contributions to human wellbeing.²⁶



Circular applications in the agriculture sector

Examples of circular agricultural approaches which integrate a regenerative dimension include shifting from synthetic to organic fertilisers, employing crop rotation, and using greater crop variation to promote biodiversity. Other examples include regenerative agricultural approaches such as agroecology, agroforestry, and managed grazing sequester carbon in the soil and improve its health; they increase biodiversity in surrounding ecosystems and enable agricultural lands to remain productive instead of degrading over time, thereby reducing pressure to expand them.²⁷

Agroecology is an integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of food and agricultural systems. Agroecological innovations are based on the co-creation of knowledge, combining science with the traditional, practical and local knowledge of producers. For example, by building autonomy and adaptive capacities to manage their agro-ecosystems, agroecological approaches empower people and communities to overcome poverty, hunger and malnutrition, while promoting human rights, such as the right to food, and stewardship of the environment so that future generations can also live in prosperity.²⁸

Recognition of the custodial traditions and knowledge of Indigenous peoples and local communities is also important, as their pastoral, cropping and forestry practices already embed circularity principles; as such they can sustain biodiversity while supporting local livelihoods, avoiding land degradation and embracing restoration of degraded lands.²⁹



Circular applications in the forestry sector

Forests are home to an estimated 80% of the world's terrestrial biodiversity. However, this biodiversity is under serious threat from deforestation, forest degradation and climate change. In addition to forest products (comprising both wood and non-wood forest products), sustainably managed forests provide important ecosystem services, such as carbon sequestration, biodiversity conservation, and the protection of water resources.³⁰

Circular approaches applied to forest management include more resource-efficient forestry practices such as risk management (for instance, diversified forest species that are more resilient to forest fires, associated with the enhancement of ecosystem services), cascading use of resources (producing advanced, high value-added bioproducts before lower value bioproducts), increased digitalisation ("forest 4.0"), closing the carbon cycle through industrial symbiosis (through composting and bioenergy carbon capture, storage and use) and resorting to new technologies.^{31 32}

Drawing on regenerative approaches of forest management such as continuous cover forestry, and employing practices such as using mixed stands, sparing veteran trees, and leaving deadwood, can help create timber production systems that regenerate biodiversity by proactively limiting habitat disturbance and improving soil health and water quality.³³



Circular applications in the food sector

A circular economy for food offers the opportunity to ensure that, through food redesign, the sector can help nature and people thrive. By designing food product portfolios that are regeneratively produced, make use of diverse, low-impact ingredients and crops, eliminate waste, and harness all the nutritional value of what is grown, the circular economy offers a systems-level approach to producing food in ways that build biodiversity while providing economic opportunities and enhancing resilience.

For example, regenerative food production practices support the development of healthy soils, which can result in food with improved taste and micronutrient content. The regenerative production of food in a circular system also increases the biodiversity on farms and in the surrounding ecosystem, while decreasing the pollution and climate impacts of the current linear food system.

A circular model encourages food designers to create products and menus with ingredients that have better outcomes for biodiversity, and any excess is redistributed or transformed for other uses to capture its value and reduce pressure to expand agricultural land. Besides directly benefiting biodiversity, if it was adopted and scaled across cities globally, a circular economy for food could reduce global food sector emissions by 49% in 2050, decrease the health costs related to the current system, and generate annual benefits worth USD 2.7 trillion by 2050.³⁴

Designing and marketing food products that appeal to people using more locally available and seasonal ingredients could also help spark the transition to regenerative practices. Using more local ingredients would likely increase the traceability of food and therefore potentially its safety. Similarly, as by-products from food production are inevitable, ensuring these by-products are used at their highest value, transforming them into new products ranging from organic fertilisers and biomaterials to medicine and bioenergy is critical to help shifting to a fundamentally different food system in which we move beyond simply reducing avoidable food waste to designing out the concept of ‘waste’ altogether.³⁵



Circular applications in the built environment

Material efficiency and circularity could help reduce biodiversity loss by reducing the demand for virgin materials for the construction of new buildings; making secondary materials available to other markets, thereby reducing the need to produce virgin materials for these markets; and increasing intensity of use by reducing the need for e.g., floor space, thereby easing land take and soil sealing. In 2016, the recycling of building materials saved 15-20% of the material cycle emissions of residential buildings in the G7; under optimistic assumptions, improved recycling could save an additional 14-18% in the G7.³⁶

The circular economy offers an approach to fundamentally transform the way we design, produce, and use materials and infrastructure to shift towards a built environment that protects and rebuilds biodiversity. A circular economy for the built environment integrates nature in urban areas by design. In doing so, the sector can reduce the pressures on biodiversity related to urban expansion, the processing of materials, and the construction of buildings. Additionally, by leaving room for nature within and beyond urban areas, and by regeneratively producing renewable materials, the sector can have a direct beneficial effect on biodiversity. Such a circular economy approach helps create biodiverse, resilient, and healthy cities.³⁷

There are multiple synergies between the circular economy and nature-based solutions that can contribute to enhancing biodiversity in urban spaces, while also maintaining the provision of urban ecosystem services. This includes green building materials such as bio-composites with plant-based aggregates, green building systems employed for the greening of buildings by incorporating vegetation in the building envelope and designing green building sites which emphasize the value of vegetated open spaces and water-sensitive urban design.

Higher levels of biodiversity in and around urban areas provide myriad environmental and socioeconomic benefits, including improved levels of mental health, better water quality, and increased resilience to climate shocks.³⁸



Circular applications in the textile sector

The circular economy offers an approach to fundamentally rethink the fashion industry to evolve from a model that degrades natural systems to one that protects and rebuilds biodiversity. A circular economy for fashion ensures that products are used more, are made to be made again, and are made from safe and recycled or renewable inputs produced in regenerative ways. In doing so, the sector can not only reduce the demand for virgin materials and eliminate waste and pollution, but also improve soil health, sequester carbon, and actively rebuild biodiversity. Alongside the benefits to biodiversity, a circular economy for fashion can address the USD 500 billion of value lost annually due to clothing underutilisation and the lack of recycling, while supporting the creation of safe, healthy conditions for textile workers and users.³⁹

3

Scaling up current efforts to reduce pressure on biodiversity is required through a better understanding of biodiversity loss drivers, internalizing its costs and increasing finance flows into nature.

Businesses and the finance sector are increasingly aware of and responding to their dependence upon nature⁴⁰, as evidenced by the emergence of initiatives such as the Taskforce on Nature-Related Financial Disclosure.⁴¹ Nevertheless, the *Global Biodiversity Outlook 5* has shown that countries have collectively failed to fully meet any of the Aichi targets.⁴² The report concludes that insufficient commitment is at the root of this failure.⁴³

Better understanding the drivers of biodiversity loss is the first step to incentivize effective policy response, and notably how our consumption and production patterns affect biodiversity. This will enhance our understanding of how to leverage circular economy strategies.

The failure to recognize the true costs of resource use or the value of waste reduction impedes the movement towards a sustainable and circular economy.⁴⁴ From policies related to procurement, taxation and subsidies, trade and regulation, to the way businesses and financial institutions make decisions on investment, risk and disclosure, it is vital that we hardwire into our economic system the value of nature in a profound way.⁴⁵

In finance, the circular economy is increasingly being viewed as an essential part of the solution to deliver on climate, biodiversity, and Environmental, Social and Governance (ESG) targets, and manage risks. Combined assets under management in public equity funds dedicated to the circular economy has grown to over USD 8 billion - 26-fold increase since December 2019 - demonstrating the potential for circular economy related financial products to attract capital inflows.⁴⁶ However, according to the report *State of Finance for Nature*⁴⁷, the total volume of finance flowing into nature is considerably smaller than the flow of climate finance. The report urged governments, financial institutions and businesses to place nature at the heart of future economic growth **by tripling the financing available for environmentally friendly projects by 2030**. As we are working towards embedding circularity in post - Covid-19 recovery packages, and in longer-term national plans, it is essential we ensure that rebuilding biodiversity and the value of nature are included as well. If nature-based solutions, which include circular approaches, are not sufficiently financed, the capacities of countries to make progress on other vital areas such as education, health and employment will be impacted.⁴⁸

Conclusion: Going Forward

Connecting the circular economy and biodiversity agendas is particularly timely, as the **Kunming-Montreal Global Biodiversity Framework (GBF)** offers a mechanism for global leaders to pursue ambitious, tangible and urgent action to transform the underlying drivers of biodiversity loss, including through circular economy, into opportunities for innovation, nature-based solutions and leadership.⁴⁹

The Kunming-Montreal Global Biodiversity Framework (GBF) can also support an exchange of information and capacities among countries and serve as the platform to trigger transboundary and sector-wide partnerships for innovation and investment in regeneration. This includes engaging with stakeholders and the private sector – for which the biodiversity agenda is growing in importance.⁵⁰ Businesses and governments can join the dots between their ambitions for economic growth and for tackling biodiversity loss by elevating their focus on business transformation based on circular economy principles. By embracing this approach, they will create new and better forms of economic growth, bring social prosperity, and enable nature to thrive.⁵¹

Circular economy & the Kunming-Montreal Global Biodiversity Framework (GBF)

Circular economy will not only contribute to the achievement of the Goal A of the Kunming Montreal Global Biodiversity Framework (GBF) but plays a key role in the compliance of:

- Target 7 – Reduce pollution from all sources, including excess nutrients, biocides and plastic waste to levels that are not harmful to biodiversity and Ecosystem functions and human health.
- Target 10 – By 2030, support the productivity, sustainability and resilience of biodiversity in agricultural and other managed ecosystems through conservation and sustainable use of such ecosystems, reducing productivity gaps.
- Target 11 – By 2030, ensure that nature-based solutions and ecosystem approach contribute to regulation of air quality, hazards and extreme events and quality and quantity of water.
- Target 15 – By 2030, achieve reduction of negative impacts on biodiversity by ensuring production practices and supply chains are sustainable.
- Target 16 – By 2030, eliminate unsustainable consumption patterns, ensuring people everywhere understand and appreciate the value of biodiversity, and thus make responsible choices commensurate with 2050 biodiversity vision, taking into account individual and national cultural and socioeconomic conditions.

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- ⁴⁰ E.g. through reports such as the Natural Capital Finance Alliance's [Exploring Natural Capital Opportunities Risks and Exposure](#) and the World Economic Forum's Annual Global Risk Reports which are increasingly dominated by risks related to the decline in the health of the planet – this is illustrated in the [2020 report](#) (prior to the COVID pandemic)
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ABOUT GACERE

Bringing together governments and relevant networks and organisations, the Global Alliance on Circular Economy and Resource Efficiency (GACERE) aims to provide a global impetus for initiatives related to the circular economy transition, resource efficiency and sustainable consumption and production, building on efforts being deployed internationally. GACERE members will do so by working together and advocating at the political level and in multilateral fora, particular at the United Nations General Assembly (UNGA), the United Nations Environment Assembly (UNEA) and in G7/G20.

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