

Investing in Nature to Transform the Post COVID-19 Economy: A 10-point Action Plan to create a circular bioeconomy devoted to sustainable wellbeing

Volume 11 | Issue 2 | June 2020

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Introduction

In the last 50 years, the biosphere, upon which humanity depends, has been altered to an unparalleled degree^[i]. The current economic model relying on fossil resources and addicted to “growth at all costs” is putting at risk not only life on our planet, but also the world’s economy.

The need to react to the unprecedented COVID-19 crisis is a unique opportunity to transition towards a sustainable wellbeing economy centered around people and nature^[ii]. After all, deforestation, biodiversity loss and landscape fragmentation have been identified as key processes enabling direct transmission of zoonotic infectious diseases^[iii]. Likewise, a changing climate has profound implications for human health³.

Putting forward a new economic model requires transformative policies, purposeful innovation, access to finance, risk-taking capacity as well as new and sustainable business models and markets. But above all we need to address the past failure of our economy to value nature, because our health and wellbeing fundamentally depends on it.

A circular bioeconomy^[iv] (see Figure 1) offers a conceptual framework for using renewable natural capital to holistically transform and manage our land, food, health and industrial systems with the goal of achieving sustainable wellbeing in harmony with nature.

Within the framework of the Sustainable Markets Initiative (<https://www.sustainable-markets.org/>), under the leadership of His Royal Highness The Prince of Wales, a 10-Point Action Plan to create a circular bioeconomy is proposed below. The Action Plan is a response to The Prince of Wales’ call to invest in nature as the true engine for our economy. The Action Plan, guided by new scientific insights and breakthrough technologies, is articulated around six *transformative* action points further discussed below and four *enabling* action points (described in Table 1), which mutually reinforce each other.

CIRCULAR BIOECONOMY OF WELLBEING

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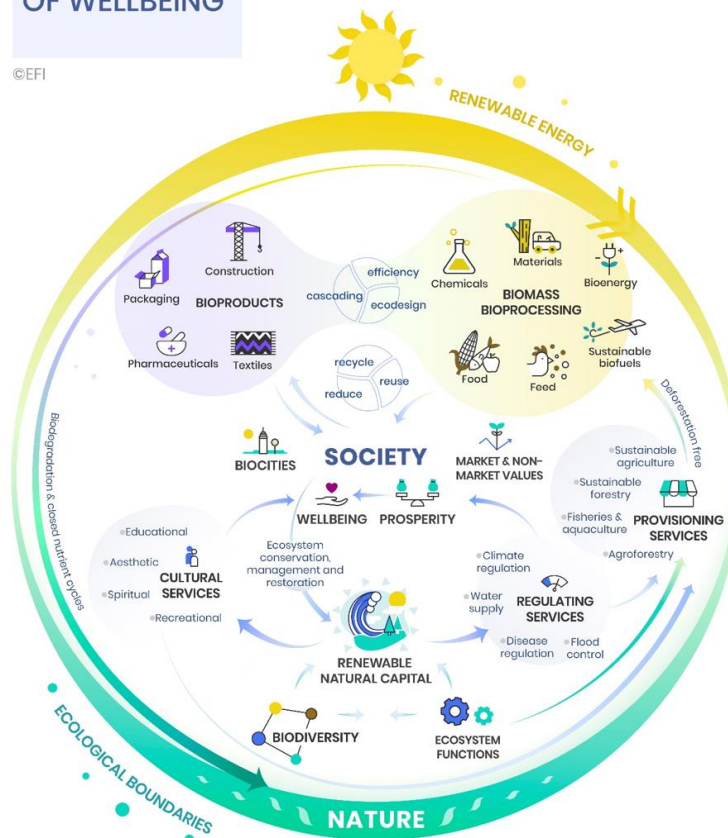


Figure 1 Flows in the circular bioeconomy of wellbeing. Source: European Forest Institute
 The circular bioeconomy relies on healthy, biodiverse and resilient ecosystems and aims at providing sustainable wellbeing through the provision of ecosystem services and the sustainable management of biological resources (plants, animals, micro-organisms and derived biomass, including organic waste) and its circular transformation in food, feed, energy and biomaterials within the ecological boundaries of the ecosystems that it relies on. The circular bioeconomy is powered by renewable energy and includes and interlinks holistically the following systems and sectors: land and marine ecosystems as well as green infrastructures and the services they provide in cities primary production sectors (agriculture, forestry, fisheries, aquaculture and aquaponics) economic and industrial sectors relying on biological resources and nature-based solutions (food, wood industry, bulk and speciality chemicals, construction, packaging, textiles, pharmaceuticals, bioenergy, and all sectors benefiting from biobased solutions or ecosystem services such as nature tourism or water supply).

1. Aim at sustainable wellbeing

The current fossil-based economy measured by Gross Domestic Product (GDP) should be replaced by an economy aiming at sustainable wellbeing centered around people and our natural environment. This means replacing current economic indicators such as GDP, which focus only on market transactions, with new indicators of sustainable wellbeing including human health, which should include the broad range of *non-market* contributions from natural and social capital (e.g., Genuine Progress Indicator^[1], or Sustainable Wellbeing Index³). The Sustainable Development Goals provide an internationally agreed framework to develop these new indicator approaches and integrate them in the national accounts accordingly. It is now technically possible to understand and measure the impact of developing a circular bioeconomy in terms of sustainable wellbeing while accounting for the tradeoffs and synergies between different SDGs³.



2. Invest in nature and biodiversity

Measures to protect and enhance biodiversity and our natural capital through two interdependent strategies are essential for sustainable wellbeing, human health and a resilient circular bioeconomy. The first strategy is based on massive research evidence showing how fostering more species-rich systems can support productive and resilient agriculture, forestry and aquaculture^[i], while avoiding the pitfalls of climate change, land degradation, resource depletion, pollution and insect decline. The second strategy aims at protecting large, contiguous biodiverse systems across different ecoregions to prevent the deterioration of global ecosystem services, species extinction and the rapid erosion of biodiversity⁷. A global concerted action to maintain and restore highly biodiverse natural ecosystems over large land areas is required to save the diversity and abundance of life on Earth^[ii]. Both types of measures require new business models and institutional instruments like payments for ecosystem services^[iii] or common asset trusts aiming at the protection of biodiversity and the provision of ecosystem services.

3. Ensure an equitable distribution of prosperity

Biological resources like agriculture or forest resources, are usually owned and managed by many more people, communities and entities, when compared to fossil resources, such as gas and oil. This offers the circular bioeconomy the possibility to generate a more equitable distribution of income, jobs, infrastructure and prosperity across a wider geography⁴. To do that, circular bioeconomy value chains need to be co-created with the participation of local communities. This means that the role of local populations, including indigenous people where pertinent, should not be limited to supplying traditional knowledge or harvesting biological resources, but it should include their participation in strategic decision-making, governance and benefit sharing^[i]. At the same time, the empowerment of women, including microfinance for women's enterprises, should be explicitly addressed to guarantee inclusive governance, poverty alleviation and overall sustainable development.

4. Rethink holistically land, food and health systems

Food systems are responsible for 21-37% of global greenhouse gas emissions and a major driver of deforestation and land degradation^[i], yet there is still widespread food insecurity and malnutrition. Transforming the land sector (agriculture, forestry, wetlands, bioenergy) towards more sustainable practices could contribute an estimated 30% of the global mitigation needed in 2050 to deliver on the 1.5°C target^[ii]. To achieve this, scaling up sustainable agriculture practices¹¹ and climate smart forestry measures^[iii] is needed to meet the demand for food while providing key regulating ecosystem services (e.g., link to climate cooling and water)^[iv] and sustainable feedstocks for producing biobased products and bioenergy. A one-health² approach is also necessary to address holistically human and animal health in connection to land use and climate change.

5. Transform industrial sector

Globally, industry is responsible for over 30% of all greenhouse gas emissions, of which the majority arise from the production of bulk materials like cement, metals, chemicals and petrochemical products^[i]. At the same time the current industrial system remains too 'linear' (for instance only 12% of the materials come from recycling globally), resource intense and based on non-renewable resources (non-metallic minerals such as sand or gravel account for about 50% of all resources that we extract globally)⁹. It is urgent to deploy scalable innovations and viable technologies to produce resource-efficient, circular and low carbon solutions based on both renewable energy and sustainability sourced bio-based materials. A good example is the first ever car made of nanocellulose, a biomaterial five times lighter and stronger than steel, produced in Japan in 2019. New biomaterials, including bioplastics, hold tremendous promise due to its lower carbon footprint and biodegradability compared to

petrochemical products⁴. For instance, new **wood-based textiles** have a climate mitigation effect of 5 kg CO₂ per kg of product used compared to polyester¹¹. Finally, sustainable fuels processed from biowaste or even carbon emissions can be now used in aviation.



6. Reimagine cities through ecological lenses

UN projections foresee 2.3 billion new urban dwellers by 2050. Producing the volume of new housing required could claim up to 20% of the remaining carbon budget for 2020-2050 if mineral-based construction materials such as steel and cement are used^[i]. A shift to biomaterials (based on engineering wood or bamboo) could substantially reduce both the amount of materials used and the carbon footprint of our cities while creating durable carbon pools^{4,15}. Using wood in construction has a climate mitigation effect of 2.4-2.9 Kg CO₂ per Kg of product used when compared to concrete¹¹ while also storing 1 ton of CO₂ in each m³ of products. Building with wood is also more resource efficient as it can reduce the total amount of materials used in construction by 50%¹⁵. Finally, the use of nature-based solutions such as urban forests, trees and vegetation has positive impacts on the health of urban populations while reducing the urban heat island effects^[ii].

Realising the potential of the circular bioeconomy through the six transformative action points described above requires an enabling environment, as reflected in the four enabling action points below, which include mutually reinforcing policies and strategies, innovation, investments, and research and education in order to trigger the necessary transformative changes across sectors and systems. Table 1 summarizes the key recommendations under the four enabling action points in connection to the six transformative action points.

Table 1: Enabling action points for a circular bioeconomy of wellbeing

Enabling action points	Key recommendations	Transformative action points targeted
7. Create an enabling regulatory framework An enabling policy framework at different scales (business, city, regional, national, global) that ensure coherence across policy areas, incentives and strategies on: nature conservation, climate, land management, waste and industrial.	Abolish subsidies that support the use of fossil fuels, while shifting taxes from labour to resource and energy consumption.	3, 5
	Develop public procurement (e.g., such as the US Biopreferred programme) and common standards, including labelling, to create a new market for circular bioproducts.	5, 6
	Put forward carbon pricing mechanisms to create a level playing field for biobased solutions and primary producers.	3, 4, 5
	Shift waste regulations from treating waste as an environmental hazard to a source of valuable materials and products.	5
	Design local to international integrated land governance and ecosystem restoration strategies, including effective governance of the global commons.	2, 3
	Integrate the circular bioeconomy concept into the existing international conventions for climate, biodiversity and desertification as well as the SDGs narrative.	All
8. Bring purposeful innovation to the investment and political agenda Purposeful and mission oriented innovation is crucial to design the circular bioeconomy future with common purpose, using nature as a guide and engaging communities to become involved through processes that encourage the co-creation of solutions.	Create innovation niches and collaboration between public and private actors from different sectors and disciplines: bio-, nano-, digital, robotics, business, etc., to reimagine business models, products and value chains.	2, 3, 4, 5, 6
	Develop new platforms (e.g., IPocean), institutions and policies related to information, patents and copyrights that provide incentives instead of hindering progress.	3, 5
	Anticipate, address and regulate ethical and human rights questions.	3
9. Ensure access to finance and enhance risk taking capacity Access to finance and risk-taking capacity are key to bring the circular bioeconomy from niche to norm. This is because it integrates a multitude of economic actors along complex value chains, everything from the protection and management of natural ecosystems, the production of biomass and food, to the deployment of new and sustainable high-tech solutions with high capital needs.	Establish venture-capital funding, green bonds, and dedicated national and international circular bioeconomy funds (e.g., the European Circular Bioeconomy Fund).	3, 4, 5
	Support public-private partnerships at national and international level (e.g., the Bio-based Industries Joint Undertaking, between the EU and the Bio-based Industries Consortium) to restore and manage ecosystems, as well as demonstrate new technologies, creating new cross-sector clusters and setting up flagship plants that deploy new technologies and demonstrate cost and performance improvements.	3, 4, 5
	Create a specific circular bioeconomy investment platform to address the increasing number of investment funds looking for sustainable investment opportunities around the world.	2, 5
10. Intensify and broaden research and education Circular bioeconomy research and development needs to be transdisciplinary, combining technology and engineering with complex systems thinking. Research needs to integrate science with traditional knowledge, business, arts, design and humanities, as well as involve relevant stakeholders in the process.	Support mission-oriented research and development in selected breakthrough projects that benefit from an international scale covering food systems, land-use, biocities, solid and liquid waste management, biorefineries, biodiversity, one health, social equity and women empowering.	2, 3, 4, 5, 6
	Create transdisciplinary research programmes and facilities including local communities to better understand the local trade-offs and synergies at different temporal and spatial scales between climate change, land-use options and the provision of ecosystem services, including biodiversity.	2, 3, 4
	Anticipate and design the new knowledge and skills on complex systems that will be required in the future within the circular bioeconomy of wellbeing, and integrate them in primary education, vocational training, academic studies and business schools, through new curricula.	All

The Action Plan for a circular bioeconomy is a call for global, holistic and transformative action to put the world on a sustainable path. The path of a circular bioeconomy of wellbeing.

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