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Circular Bioeconomy Alliance Principles for Regenerative Landscapes





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Introduction

The Circular Bioeconomy Alliance (CBA) was established in 2020 by His Majesty King Charles III, then His Royal Highness The Prince of Wales. The CBA aims to accelerate the transition to a **circular bioeconomy** that is climate neutral and inclusive, and prospers in harmony with nature. It provides knowledge-informed support as well as a learning and networking platform to connect the dots between investors, companies, governmental and non-governmental organizations and local communities to advance the circular bioeconomy while restoring biodiversity globally.

As one of its core activities CBA is establishing a global network of **Living Labs for Nature, People and Planet**, that demonstrate by action on the ground how harmony can be achieved between nature and people in the context of concrete landscapes. CBA Living Labs aim at empowering local communities by integrating traditional knowledge, and by capitalizing on research and innovation in public-private partnerships. For each Living Lab, a nature-based regenerative project is the starting point to catalyse the development of circular bioeconomy value chains, while restoring biodiversity, mitigating and adapting to climate change, and improving local livelihoods. They are the start of a journey towards sustainable and resilient communities and landscapes.

For the purpose of inspiring, selecting, implementing and assessing CBA Living Labs, as well as any CBA-related efforts, projects and funds to scale up landscape regenerative globally, there was a need to develop CBA- specific regenerative principles. The resulting principles called **CBA Principles for Regenerative Landscapes** have been informed by the state of knowledge on transition to a more sustainable and resilient social-ecological system. In a later stage, these principles will form the basis for a CBA standard of criteria and indicators, which allows evaluation of compliance with the CBA principles. The CBA anticipates awarding the Terra Carta Seal as a recognition of excellence for land regenerative projects complying with this standard.



Background

The CBA principles are embedded in the fundamental goal of the CBA, which is to foster a transition to a circular bioeconomy supporting biodiversity and human well-being. In a 10-point action plan, the CBA sketched the pathway of such transition around six transformative action points (1-6) and four enabling action points (7-10), which mutually reinforce each other and need to be implemented in an integrated manner: 1. Focus on sustainable wellbeing; 2. Invest in nature and its biodiversity; 3. Generate an equitable distribution of prosperity; 4. Rethink land use, food and health systems holistically; 5. Transform industrial sectors; 6. Reimagine cities through ecological lenses; 7. Create an enabling regulatory framework; 8. Deliver mission-oriented innovation to the investment and political agendas; 9. Enable access to finance and enhance risk-taking capacity; and 10. Intensify and broaden research and education (Palahí et al. 2020).

The action points above provide the conceptual framework to develop a set of CBA principles to assess landscape restoration initiatives, according to their **sustainability, resilience and local context**, aiming at the **creation of regenerative landscapes** (Figure 1). Regenerative is a term that recently emerged in the context of agriculture (Rhodes 2017). It refers to the idea that restoration should go beyond the status quo of sustainability and work towards the regeneration of a truly resilient system in a particular context.

Such new set of principles is needed because despite a number of frameworks specifically focussing on restoration (cf. FAO et al. 2021; di Sacco 2021), most of them, include a more or less arbitrary selection of sustainability and resilience principles. Furthermore, they fail to capture the multidimensional nature of the CBA approach: creating interdependent landscapes and circular bioeconomy value chains that are sustainable, resilient and in harmony with a specific context.

Therefore, we present a new coherent set of sustainability and resilience principles that put strong focus on the landscape context. We call them **CBA Principles for Regenerative Landscapes**. They are inspired by existing frameworks (amongst others the UN Sustainable Development Goals, the Accountability Framework Initiative, the Resilience Alliance), complemented with recent scientific insights.

Landscape regeneration

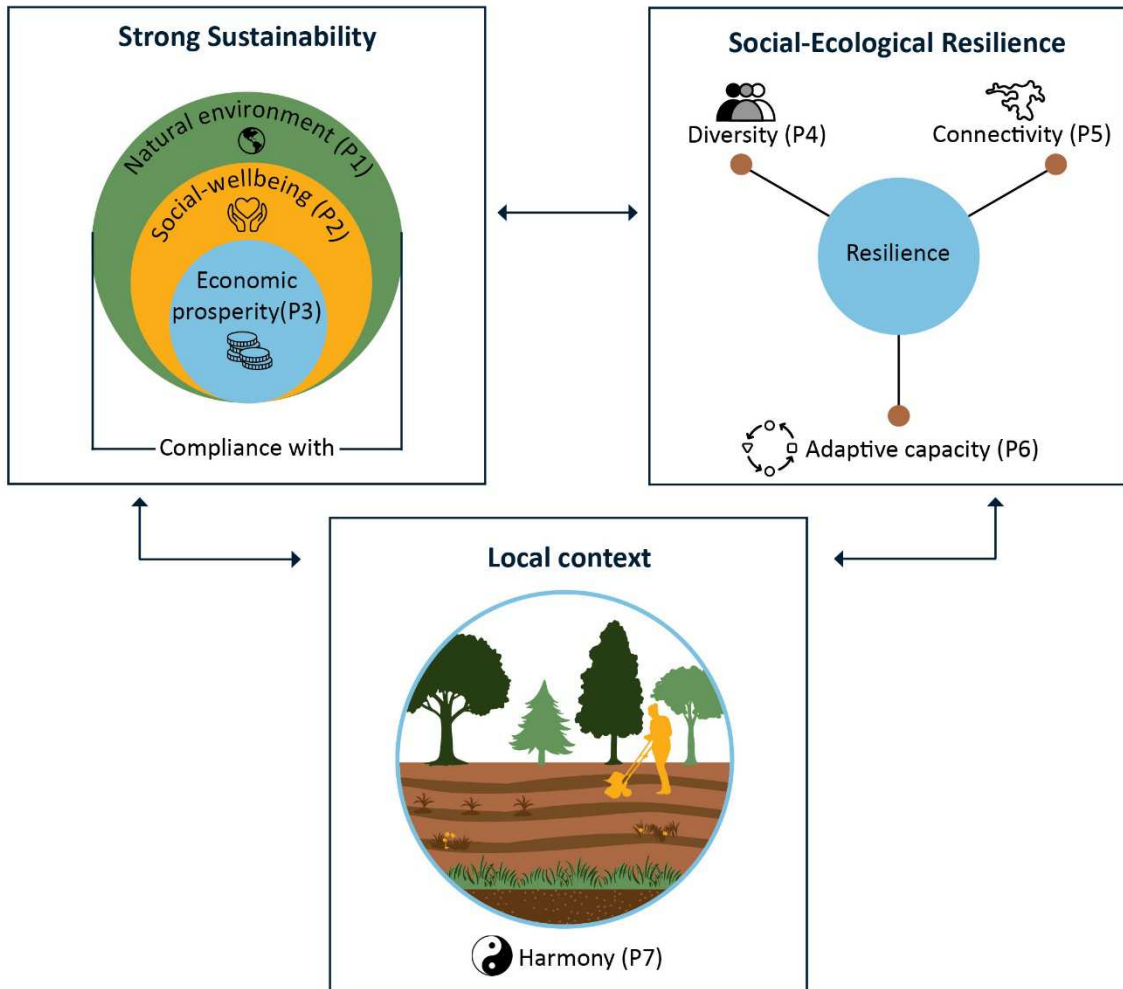


Figure 1: The CBA principles for regenerative landscapes find their origin in strong sustainability, social-ecological resilience and harnessing local context as the conceptual basis for landscape regeneration.

The CBA principles for regenerative landscapes

The CBA set of principles for regenerative landscapes consists of **7 principles**, composed of **3 sustainability** principles, **3 resilience** principles and **1 local context** principle.

- **Sustainability** is assessed via three principles focussing at the impacts on (i) **nature and the environment**; (ii) **social wellbeing** and (iii) **economic prosperity** of the landscapes and value chains created.
- **Resilience** is assessed via three principles, being (iv) **diversity**, (v) **connectivity** and (vi) **adaptive capacity**.
- **Local context** is assessed using one principle, being (vii) **harmony**.

Every principle is presented with a title (in bold), the principle formulation itself (in italic) and an explanation (in plain text). Principles have been carefully selected to cover all issues, avoid redundancy, and allow checking of compliance with measurable criteria and indicators.

This standard is meant as a source of inspiration during all development phases of a **regenerative project**, from design and planning to implementation and evaluation.

Defining the principles

Principle 1. Natural environment – *Design for environmental sustainability, reverse Nature's degradation and support ecosystem health.*

The first principle emphasizes the need to design and implement regenerative projects and value chains that support the health of the natural environment. The regenerative project should involve renewable bio-based production, minimizing harmful fertilizers and pesticides, avoiding eutrophication, land degradation, deforestation and fragmentation of ecosystems, and protecting biodiversity. It should also adopt safeguards to avoid leakage, indirect land-use change, and greenwashing.

Principle 2. Social well-being – *Involve local communities, respect indigenous peoples' rights and aim at equity, human health and happiness.*

Regenerative projects should play a pivotal role in creating socially inclusive landscapes and value chains that promote well-being. A regenerative project should advance equity among its stakeholder groups, including gender equality and indigenous peoples' rights, to ensure that benefits from regenerative do not accrue to a small elite, or conversely that costs of regenerating land are not borne disproportionately by the powerless. Effective governance arrangements and conflict management will be key for long-term social



sustainability. This principle promotes co-design and co-creation of diverse business models.

Principle 3. Economic prosperity – *Design in support of the circular bioeconomy and target sustainable creation of wealth.*

In a concept of strong sustainability economic prosperity thrives at the service of human well-being, and always operates within the boundaries required to secure the health of the natural environment. Regenerative projects should be supported by sustainable business models and value chains generating long-term stable income from Nature's Contributions to People (NCPs), and enhancing the prosperity and economic stability of indigenous peoples and local communities. Bioeconomy activities should strive for fast phasing-out of fossil resources, promote the sustainable sourcing of renewable resources including food, feed, fibre and fuels, and should foster novel financial and governance instruments related to safeguarding climate, biodiversity and water, or generating value from recreational, spiritual or health-related services.

Principle 4. Diversity – *Manage risks by diversifying species, products and markets.*

Regenerative projects should enhance social and ecological diversity. Diversity is a key property of social-ecological systems that ensures system performance, insurance against risks and multifunctionality. In the face of rapid environmental change, increasing biological diversity, as well as the diversity of products and markets provides a portfolio effect that reduces the risk of system failure. In other words, diversity supports resilience. This includes value chains that rely on a large variety of green commodities and other, such as food, wood construction, biomaterials, biopharmaceuticals, bioenergy, biochemicals, nature tourism and water supply.

Principle 5. Connectivity – *Promote connectivity and collective impacts among nature and people.*

Regenerative projects must promote connectivity and collective impacts among nature and people. Social-ecological systems develop their complexity and stability thanks to strong connectivity and information exchange between their members. Restoring connectivity will imply safeguarding larger natural areas and indigenous peoples' lands, set-aside conservation corridors, and investing in ecological defragmentation. Restoring connectivity also implies to promote interactions and build bonds between and within communities across regenerated landscapes.



Principle 6. Adaptive capacity– *Act for the long term based on monitoring and learning, keeping the social-ecological system flexible and adapted to upcoming challenges.*

Regenerative projects should build resilience and adaptive capacity of the social-ecological system. Overly connected systems hold risk of becoming more vulnerable. To ensure lasting success, a regenerated landscape should gain resilience to future shocks and change. This requires anticipatory action based on learning and adaptive behaviour. Continual learning and innovating enable adaptive capacity and involves capturing and sharing lessons learned from successes and failures locally and elsewhere. It also entails assimilating information from baseline assessment and holistic monitoring, and exploring how to deal with risk and uncertainty in an informed way. Building adaptive capacity involves empowering local decision-making authorities and rightsholders, to ensure that they are able to take optimal decisions on the land use that directly affects them. Adaptive behaviour will require training to tackle unlikely events in strategic, tactical, and operational planning.

Principle 7. Harmony – *Understand and embrace the local context, respecting laws and customary rights, including traditional knowledge, and finding balance between interests.*

A regenerative project aims for harmonious solutions by evaluating the project's integration into the local context, compliance with laws and customary rights, consideration of local knowledge and traditions, and finding balance and synergies in conflicts between nature and humans or trade-offs between nature's contributions to people. It is crucial for regeneration projects to initiate and support institutional and regulatory changes that promote sustainability and resilience, while also respecting all applicable laws, international treaties, and agreements of the relevant jurisdictions. To ensure the success of regeneration efforts, a deep understanding of local ecological, socio-economic, and political conditions is essential. This includes considerations such as suitable site selection, species adaptation to regeneration objectives and anticipated climate changes, existing governance structures, ongoing or potential land tenure conflicts, and the risk profile for extreme events.



Applying the principles

The principles will be completed with criteria to make them more concrete, and together they will form a standard to be used during all stages of the adaptive planning cycle of a regenerative project, from design and planning to implementation and evaluation (figure 2).

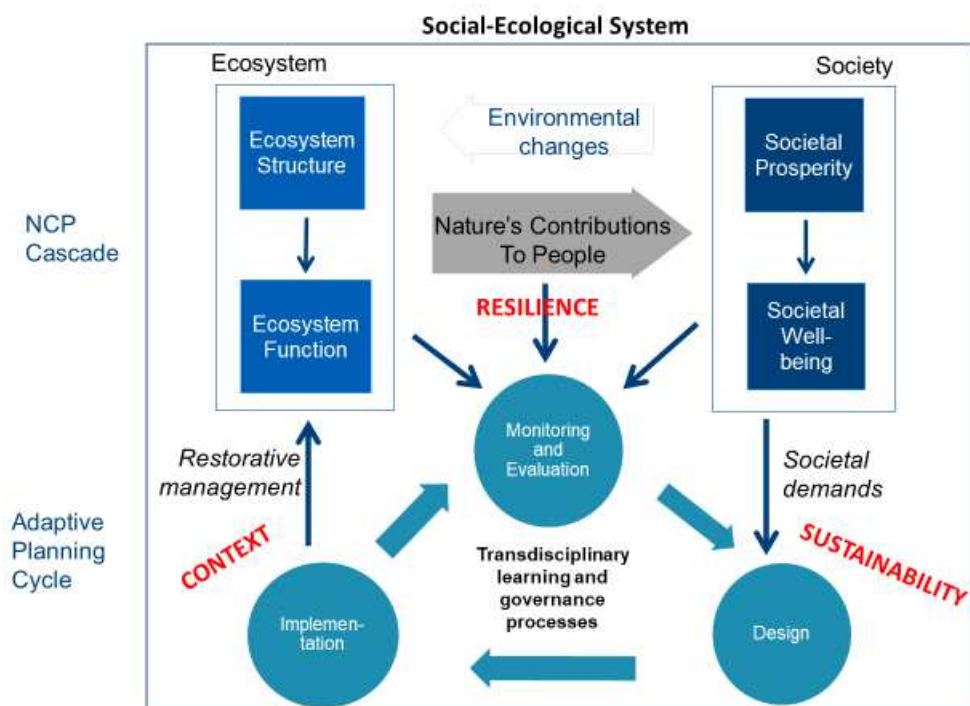


Figure 2: Regenerative landscapes are social-ecological systems where the ecosystem and the human society are narrowly intertwined. Both show structural components (biomass and biodiversity in the ecosystem, element of prosperity like financial resources and infrastructure in the human system) and functional components (ecosystem functions like growth and recycling in the ecosystem, and aspects of health, peace and well-being in the human system). Humans manage the ecosystem in order to optimize the flow of nature's contributions to people. Ideally this restorative management follows an adaptive planning cycle where sustainability, resilience and context dependency of the landscape at stake are the overall goals. These goals are translated in principles and criteria that are addressed during design, implementation and monitoring and evaluation stages. The adaptive planning cycle is a process of continuous improvement fed by transdisciplinary learning and governance processes, in which all stakeholders are involved.



Box 1: Glossary

Adaptation / Adaptive: Adaptation is the process of adapting to changing environmental, socio-economic or political conditions. Adaptability or adaptive capacity is having the ability and flexibility to adapt to changing conditions (Folke et al. 2010).

Biodiversity: Biological diversity at different scale levels from the level of the gene to the level of the ecosystems, as well as interactions within and among species and habitats. Biodiversity is both a heritage and an asset supporting the productivity and stability of ecosystems. It is a property of nature that secures the flow of all nature's contributions to people. As such, biodiversity loss is considered one of the major threats to humanity (Diaz et al., 2018).

Circular bioeconomy: The circular bioeconomy relies on healthy, biodiverse and resilient ecosystems and aims to provide sustainable wellbeing for society at large. This is achieved through the provision of nature's contributions to people 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 (Palahí et al. 2020).

Landscape: an area of land that is home to a social-ecological system consisting of nature, humans and their land uses. It includes at least the project area and the surrounding watershed, with their biophysical characteristics and governance structures. Landscapes are strongly interlinked with each other and with aquatic including marine systems, altogether forming interactive wholescapes.

Nature's Contributions to People (NCP): All contributions of nature to the quality of life for people. Beneficial contributions (also called ecosystem services) from nature include food provision, water purification, flood control and artistic inspiration, whereas detrimental contributions include disease transmission and predation that damages people or their assets. NCP may be perceived as benefits or detriments depending on the cultural, temporal or spatial context (IPBES 2019).

Regenerative / Regenerative: Regenerative is a net positive process of restoring, improving and revitalizing previously degraded or over-intensified land use systems. It refers to sustainable and resilient social-ecological systems with some level of self-regulation, net-zero climate forcing and strong adaptive capacities (modified after Rhodes 2017). Regenerative projects are contributors to regenerative landscapes.

Resilience / Social-Ecological Resilience: Resilience has different meanings, e.g. the rate of bouncing back after disturbance. Social-ecological resilience is the broadest



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resilience concept defined as the ability of a social-ecological system to prepare and adapt to change (after Folke et al. 2010; Nikinmaa et al. 2020; Nikinmaa et al. 2023).

Restoration: The process of reclaiming and healing ecosystems, resulting in recovery of vital ecosystem functions and valuable NCPs.

Social-Ecological System: a complex living system where human communities co-exist with ecosystems and their biodiversity. Conceptually, it implies a mindset avoiding too strict separation between nature and human society.

Sustainable development / Strong sustainability: Sustainable development is progress in human prosperity and well-being without causing substantial loss of ecosystem structure and function (Muys 2013). Strong sustainability is an interpretation of sustainable development where the economy remains at the support of human well-being and within planetary boundaries (Griggs et al. 2013).

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