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A "shared earth" approach to put biodiversity at the heart of the sustainable development in Africa

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A "shared earth" approach to put biodiversity at the heart of the sustainable development in Africa

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Résumé
La biodiversité est un exemple classique de bien commun mondial. Face au changement climatique rapide, au déclin de la biodiversité, à la croissance démographique et aux enjeux de croissance économique, les pays d'Afrique subsaharienne sont confrontés à un défi existentiel pour leur sécurité et leur bien-être. Nous lions ici les « approches par les communs » à une approche nouvelle de la planification locale basée sur la notion de « terre partagée ». Cette démarche se concentre sur la santé et les services de la nature dont dépend notre existence. Elle combine les préoccupations de conservation avec les moyens de subsistance et avec les cultures et les institutions locales dans le but d'imaginer des solutions locales qui répondent aux besoins des populations tout en garantissant la préservation de la biodiversité et de ses services pour l'avenir. Bien menée, cette approche peut faciliter la participation équitable des acteurs locaux à des chaînes d'approvisionnement à plus grande échelle et transnationales, à partir de principes partagés d'équité d'accès et d'usage de la nature. Cette démarche peut ainsi aider les pays africains et leurs partenaires à réajuster leurs obligations respectives à l'échelle mondiale, au titre des objectifs de développement durable (à 2030) et du nouveau cadre mondial de la biodiversité (à 2050), tout en répondant aux besoins locaux et en préservant une certaine qualité de vie.

Mots-clés
biodiversité, Afrique, communs, négociations internationales, conservation

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Abstract
Biodiversity is a classic example of a global commons. As we enter the coming decades of a rapidly changing climate, declining biodiversity, growing human populations and economic growth, sub-Saharan Africa countries are facing an existential challenge to their security and welfare. We blend commons approaches with a new 'shared earth' approach to local planning, focusing on the health and benefits of nature where people live and earn their livelihoods. The approach combines conservation with livelihoods, local cultures and local institutions to generate local solutions that meet peoples needs at the same time securing biodiversity and its benefits into the future. Done right, this approach can facilitate equitable participation of local actors in larger scale and transboundary supply chains, through shared principles of equity of access to and use of nature. This approach can help African and partner countries balance their obligations globally under the Sustainable Development Goals (to 2030) and the new global biodiversity framework (to 2050), while meeting local needs for a good quality of life.

Keywords
biodiversity, Africa, commons, international negotiations, conservation

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Introduction

Biodiversity, defined as the diversity of habitats and ecosystems, of species and genetic diversity in all living forms, is the living component of natural capital and plays a crucial role in the transformation of African economies to reach the Sustainable Development Goals (SDGs). First, because the economies of many African countries rely on natural capital and on the good ecological status of this natural capital, given the disproportionately high reliance of Gross Domestic Product (GDP) and a large proportion of the workforce on nature-dependent sectors: agriculture relies on good ecological status of soils and agricultural ecosystems; fisheries are dependent on the quality of freshwater and marine ecosystems; aquaculture on the good quality of water; tourism on the conservation of ecosystems and species.

Second, demographic growth in many Sub-Saharan African countries will necessitate maximizing the number of jobs that can be made available in the future, such as in the agrifood sector and in rural areas, including not only farmers but also the first collecting and processing stages in the food industry (Losch, Fréguin-Gresh, and White 2012 ; Dorin 2017 ; Sourisseau *et al.* 2017). This is for two reasons: first, the difficulty to increase jobs in other sectors, where competition is stiff with other countries with higher levels of labor intensity due to mechanization, robotization and digital transformation; and second, such an investment in the agrifood sector can drive similar structural transformations across other sectors within national economies (Timmer 2017). While this issue is crucial in African economies, it is also the case in other countries such as India, which despite its economic development also has to cope with this employment issue.

Adding the importance of extractive sectors (mining, oil and gas) in many African economies for their balance of payments poses two main challenges. If not done sustainably, this development could have a large environmental impact through the degradation of ecosystems, thus impairing the very basis of the natural capital that is so important for the transformation pathway towards prosperity for all (Okafor-Yarwood *et al.* 2020; Obura 2018). Additionally, these sectors often have a negative social impact if access to the prosperity they produce is captured by a minority.

Sub-Saharan biodiversity is already in decline. The continent is subject to intensive deforestation, mainly linked to agriculture, timber extraction, urbanization and the rise of biofuel plantations (UNEP 2012). Between 2015 and 2020, the continent lost 4 million hectares of forest per year, the highest rate of net forest loss in the world (UNEP and WCMC 2016), which testifies to an intensification of deforestation during the last decade (Hansen *et al.* 2013). In addition to the overexploitation of terrestrial forests, in West and Central Africa, between 20 and 30% of mangroves have disappeared in the last 25 years (UNEP and WCMC 2016) while desertification affects 45% of the continent's land area (Mansourian and Berrahmouni 2021).

A total of 500,000km^2 or 2% of the continent's land area is considered as degraded (WWF 2018).

The exploitation of these lands goes hand in hand with declining populations and increasing extinction risk of animal and plant species: the Red List Index for sub-Saharan African dropped from 0.79 in 2000 to 0.72 in 2021 (UNECA 2022). Fauna and flora are weakened because their habitat is endangered (Burgess *et al.* 2004). Ocean warming has resulted in coral mortality of more than 50% in certain regions (Obura *et al.* 2017). Fresh water ecosystems are particularly endangered (Darwall *et al.* 2018) as 21% of all freshwater species in Africa are listed as threatened (Darwall *et al.* 2011), and 45% of freshwater fish and 58% of freshwater plants are overexploited (UNEP and WCMC 2016).

The UNDP attributes this degradation to multiple factors, including natural, human, demographic and regulatory (PNUD and BES-Net 2022), and stresses that these factors are likely to continue to exert negative pressure on African biodiversity. However more than 60% of Africa's population is directly dependent on ecosystem services to meet food, water, energy, health and livelihood needs (IPBES 2018).

It is certain that the degradation of the biodiversity of the African continent will be intensified with the consequences of climate change (Li *et al.* 2019; Connolly-Boutin and Smit 2016). Temperatures are expected to increase more than the global average (IPCC 2018), extreme rainfall frequency is likely to increase (Akumaga and Tarhule 2018), extinction risk for mammals and birds will increase, and climate change's impact on pests and pathogens could significantly affect human health (IPBES 2018; Archer *et al.* 2021).

Lastly, Sub-Saharan Africa hosts an important proportion of remaining hotspots of biodiversity globally (IPBES 2018), because of its geographic situation in the intertropical zone, development and resource extraction have not penetrated into the most remote or inaccessible regions. Further, some of the cultures and communities that still exert stewardship over many of forest or savannah ecosystems in African countries have not intensified their use of natural resources to levels causing significant impacts to these ecosystems. "The unrealized potential of Africa's biodiversity, ecosystem services, spirituality, culture and identities places the continent in a unique position globally – it can serve as a source for generating development pathways that are truly sustainable, where people's wellbeing and needs can be met without negatively infringing on the environment" (Archer *et al.* 2021, 3).

A critical question facing many countries is the following: what regulations and governance frameworks can resolve the tension between two major objectives that must be reached jointly, namely that 1) biodiversity is conserved and plays the critical role needed in a sustainable transformation of Sub-Saharan African economies, and 2) enough decent jobs and incomes are created in the economic transformation towards sustainable development in each country to ensure prosperity for all?

Following the work by Elinor Ostrom and the Bloomington School of Political Economy, there is an extensive body of literature describing how Common Pool Resources (CPR) mana-

gement of natural resources at local scales (e.g. a forest ecosystem, or water resources, in the context of management practices and institutions of indigenous people and local communities) can lead, in some cases and under certain conditions, to sustainable management (ecological viability, equitable allocation of uses and benefits). Leyronas, Coriat, and Nubukpo (Forthcoming) describe the Sub-Saharan African commons of land and natural resources, the conditions of their emergence, the factors of fragility, even failure. Several examples show how CPR management institutions have been jeopardized by external factors, including technological change, modernization, State-driven development interventions, among others.

The examples illustrate the extent to which new policy arrangements need to be designed to secure the commons of land and natural resources while ensuring that access to resources is equitable and sustainable. From a biodiversity perspective, there is a need to go even further by taking into account not only local economic actors and communities, but also regional and even global scale supply chains that drive local economic development. It is in this context that the multilateral negotiations on a new Global Bio-diversity Framework (GBF) are taking place, designing the international framework for biodiversity governance to 2030 and with long term goals to 2050, and its implementation strategies at national scales.

This chapter analyses how the main discourses that structure the GBF are playing out with respect to the specific challenges and aspirations of Sub-Saharan African countries. It outlines the directions in which African countries' voices could change the dominant narrative on biodiversity protection, towards a broader narrative framed by commons approaches. These explore how conservation, the sustainable use of biodiversity, and exploitation of natural resources in supply chains, can effectively arrive at a balance that could be at the heart of future development that addresses local needs and priorities within the broader contexts of national and regional governance and development aspirations.

The first section will present the outline of the current state of GBF negotiations and two main perspectives on it in the scientific literature. While historically a focus has been on the core role of protected areas for biodiversity protection, a broader perspective on sustainability anchored around protected areas in the broader landscape is emphasized, and the relevance of this in the sub-Saharan African context. The second section will then examine an emerging framing proposed by African experts, putting the emphasis on sharing landscapes and ecosystems and including ecosystem conservation and protected areas in an integrated land- and seascape approach to rural and regional development. This section also discusses the analogies and links between this "shared earth" approach (Obura *et al.* 2021) and the commons perspective, based in particular on local examples of biodiversity-based development pathways. In the last section, we analyze how drivers of biodiversity degradation embedded in regional and national development as well as in global supply chains need to be regulated through a multi-scalar commons-based approach, forging links between public policies and market approaches to supply chains.

1. The global biodiversity framework

1.1. International institutional organization of the debate

The GBF is the working name for the draft strategic plan for biodiversity conservation for the period 2021-2050 (CBD 2021), succeeding the Strategic Plan for 2011-2020 and its twenty Aichi Biodiversity Targets[1] (CBD 2010). Consultations on the GBF were envisioned to run from mid-2019 to the 15th Conference Of Parties (COP) of the Convention Of Biological Diversity (CBD) slated for late 2020 through an "open ended working group" (OEWG), with three in-person workshops planned, starting in August 2019. Due to the global COVID-19 pandemic, the OEWG process dragged into late 2022, increasing to five in-person workshops and numerous online consultations filling the extended space. The process built on a "zero draft" document conceptualized by the OEWG co-chairs, which evolved through multiple revisions of a "first draft" still under negotiation leading into the fifth OEWG slated for 5-7 December 2022, immediately prior to the CBD's COP15 in December 2022. At the time of writing of this article, the GBF is structured around four long-term outcome goals for 2050 to meet the 2050 Vision of the CBD ("Living in harmony with nature") with 23 proposed action targets for 2030 to direct and guide investments on conservation actions.

Two main approaches have dominated debate on the GBF (Bhola *et al.* 2021). The "30x30" or "half earth" movement is the dominant one, particularly in campaigns and communications around the new strategy: it focuses on direct conservation actions particularly centered around protected areas, and on identifying a single "apex" or headline target or goal to rally support. By contrast, "holistic" approaches focus on the complex integration of human-environment interactions and dependence, and the intersection of social, economic and ecological spheres. The arguments of each vision are based on radically different values, beliefs, understandings and representations of nature among countries and actors.

1.2. The "30x30" approach to biodiversity conservation

Motivated by the success of the 1.5°C warming target for the United Nations Framework Convention on Climate Change (UNFCCC) as a "north star" guiding climate action, many conservation actors have sought a similar "apex target" for biodiversity conservation. However, the complexity of biodiversity and its variation over the planet has made this difficult (Díaz *et al.* 2020; Purvis 2020). As with the Aichi Targets from 2011-2020, campaigns have rallied around the proportion of land and sea covered by protected areas, under the banner of "30 by 30" (30% of land and sea protected by the year 2030). In this framing the areas under protection are intended to be optimally placed and well managed to assure protection of biodiversity within. Confidence in this approach is undermined by experience with

[1] https://www.cbd.int/doc/decisions/cop-10/cop-10-dec-02-en.pdf

Aichi Target 11[2], where countries jointly achieved the sub-target for area under protection, but attention to representativity, effective management and equitable treatment of indigenous peoples and local communities was poor (Secretariat of the Convention on Biological Diversity 2020).

This highlights the fact that protection on its own can fail to achieve many other objectives for nature conservation, including assuring multiple benefits to people, such as food provisioning and access to other Nature's Contributions to People (NCP). Such failures could significantly harm large numbers of vulnerable people (Schleicher *et al.* 2019; Mehrabi, Ellis, and Ramankutty 2018; RRI 2020), and reinforce the necessity to recognize that social factors (such as tenure, rights and agency issues with people living in priority biodiversity protection zones) are closely connected to challenges and successes in protecting biodiversity.

Box 1: Experience with rural livelihoods and biodiversity protection in the Limpopo National Park, Mozambique

An evaluation report of the French Development Agency (Bazin and Quesne 2016) highlights the challenges of conservation and rural livelihoods in the Limpopo National Park (LNP), a protected area in Mozambique on the borders of South Africa and Zimbabwe. It was created in 2001 as a peace-building project and forms with the Kruger National Park (KNP) in South Africa and the Gonarezhou National Park in Zimbabwe, the Greater Limpopo Transboundary Park. Spread over an area of 11,230 km^2 (or 1,123,000 ha), the LNP was originally populated by 20,000 people, mainly people who returned to Mozambique after fleeing the civil war that occurred between 1977 and 1992.

Since the early phases of its development, the LNP has attempted to adopt, with varying degrees of success, an inclusive approach involving the integration and strengthening of the park's riparian communities and aimed as much at biodiversity protection as at socioeconomic development. Unlike most protected areas on the African continent (Boche, Leyronas *et al.*, Forhcoming), the LNP does not exclude populations but welcomes them within its perimeter. In 2016 the LNP counted 27,000 people spread over about fifty villages living mainly from livestock and agriculture as well as hunting. At this time, the majority of the population (20,000 people in 44 villages) lived in a specific zone distinct from the central zone of the park, from within which they could access and use all the natural resources that they need.

The LNP attempts to reconcile the socioeconomic reality of the populations with the objectives of biodiversity preservation and conservation, as well as implementing mechanisms to reduce conflicts between humans and wildlife. In order to encourage environmental preservation and the sustainability of the natural protected area, the LNP plans to share its direct and indirect benefits with the local populations. The LNP's conservation objectives are all the more important because the demands of

[2] "By 2020, at least 17% of terrestrial and inland water, and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes."

the international market, and in particular the Asian market, for elephant ivory and rhino horn, are generating high pressure on wildlife in sub-Saharan Africa, encouraging poaching (Bazin et Quesne 2016). In 2014, Mozambique recorded a 48% decline in its elephant population, 25% of which occurred within the LNP. However, several wildlife reintroduction campaigns carried out during the 2000s and 2010s contributed to an increase in the population of certain species within the park, including elephant, buffalo, kudu, nyala and waterbuck.

Despite a development plan focused on tourism, this activity only manages to cover 20-25% of the operational costs of the natural protected area. Since 2008 16% of the park's revenues (20% of the total revenues generated) have been redistributed to the communities living within the park. However, distributed among the fifty villages, this amounts to just 500 euros per village annually, or about 1 euro per year per inhabitant. Additionally, although the LNP management plan permits traditional hunting activities to provide food and additional income for local communities, it appears that LNP officials simply prohibited hunting.

Responding to these critiques, the conservation community has searched for new concepts such as the "new deal for nature" (The Nature Conservancy 2020) and "nature positive" (Locke *et al.* 2021). But their anchoring in the historically protectionist conservation movement, and the fact that they pay secondary attention to social and equity issues, and almost no attention to reducing drivers of the global decline of biodiversity originating in the Global North, continue to raise concerns about the fit of these approaches to emerging social, economic and environmental challenges in sub-Saharan Africa.

1.3. The "holistic" approach to biodiversity conservation

In the context of the GBF, the "holistic" camp has been anchored in scientific foundations of the complexity of nature-human interactions (Díaz *et al.* 2020; Leadley *et al.* 2022). It has been injecting these considerations into technical guidance for the GBF, as well as through broader discussions around meeting peoples' needs (Schleicher *et al.* 2019; Mehrabi, Ellis, et Ramankutty 2018) and social dimensions anchored in local communities and indigenous perceptions of human-nature interactions (Bhola *et al.* 2021; Büscher and Fletcher 2019).

The growing contributions of IPBES to global biodiversity and sustainable development policy circles (IPBES 2019; IPBES 2022a) and its increasing collaboration with the Intergovernmental Panel on Climate Change (IPCC) (Pörtner *et al.* 2021) provide a broader science-policy framing for these approaches. Specifically for the GBF, this perspective emphasizes the need for synergistic and comprehensive approaches that integrate all levels of biodiversity such as genes, species and ecosystems rather than focusing on one as a proxy for all, and of addressing all targets of the GBF together rather than focusing on one "apex" target.

Importantly, "holistic" approaches emphasize the need to focus on structural changes underpinning any proximate actions such as on protected areas. These structural aspects reflect the indirect drivers

(socio-economic and demographic trends, technological innovation, culture and government for example) identified in IPBES (2019). This is illustrated in fig. 1, where GBF targets are shown to be linked across the whole of the SDG framework, across nature, economic and social goals, and the governance arrangements needed to maintain the whole. This figure shows nature as the foundation (bottom tier) for economic goals that depend on ecosystem services and contributions from nature to people (second tier), that in turn support social benefits and welfare (third tier). The top tier represents the means of implementation (knowledge, finance, policies) necessary to maintain the system. On either side, the 23 targets of the Global Biodiversity Framework are shown, as well as their relationship to individual or groups of SDGs in the sustainable development model.

Figure 1. A model of the SDGs showing nature as the foundation (bottom tier) for economic goals

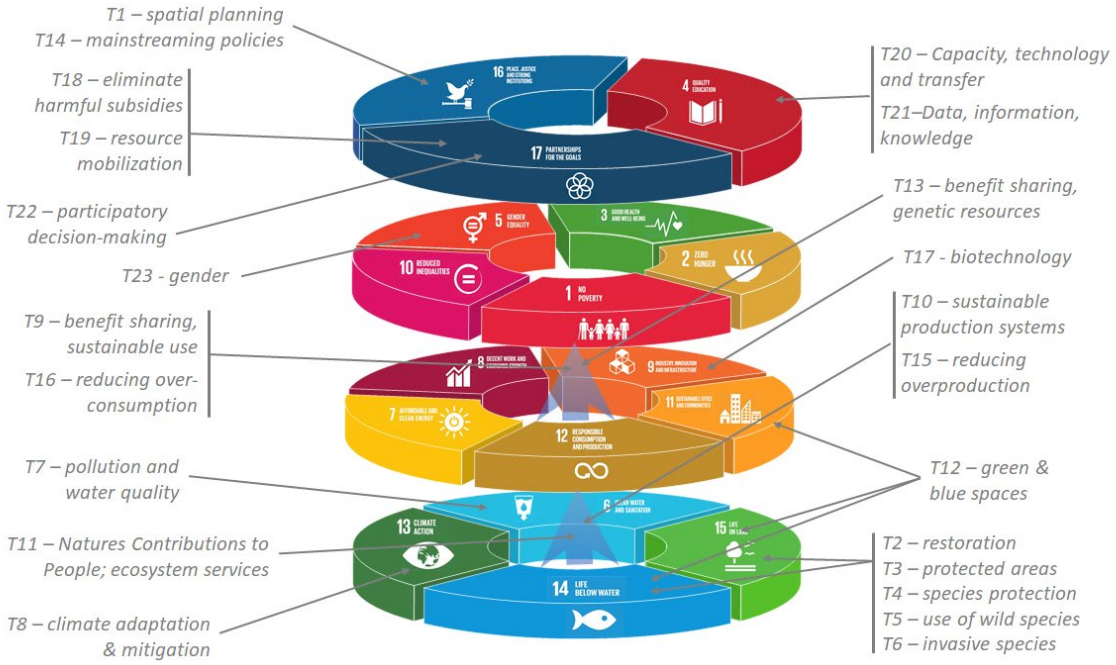


Figure 1. A model of the SDGs showing nature as the foundation (bottom tier) for economic goals that depend on ecosystem services and contributions from nature to people (second tier), that in turn support social benefits and welfare (third tier). The top tier represents the means of implementation (knowledge, finance, policies) necessary to maintain the system (based on Obura 2020). On either side, the 23 targets of the GBF are shown, and their relationship to individual or groups of SDGs in the sustainable development model.

These two perspectives differ in their understandings and representations of nature, particularly in relation to how closely people and nature are entwined and perceived by different value systems (IPBES 2022). However, they have much in common. For example, the key tenet of the "apex" campaign is that 30% or "half" the earth should be protected, based on biodiversity prioritization analysis. The holistic approach doesn't necessarily dispute these proportions, but it does fundamentally differ on how to achieve these and on the questions "by whom, for whom, how, why". Their shared ambition to reverse current trends and transform the actions of companies and local jurisdictions to do their part to sustain biodiversity should not be underestimated.

2. An African vision for biodiversity – a "shared earth approach"

2.1. The "shared earth approach" towards sustainable development pathways of Sub-Saharan African countries

At the Africa Protected Areas Congress, held in Kigali, Rwanda, from 18-23 July 2022, dominant messaging from leading conservation groups going into the congress was about supporting the "30x30" target[3]. Importantly, the Kigali Call to Action[4], arising from the Congress, emphasized the need to focus on African needs, people and priorities, and omitted any citation of the global conservation movement's slogans in relation to "30x30", "nature positive" and others.

The "shared earth, shared ocean" approach to conservation was developed by a group of African scientists, conservationists and community leaders, to guide the repair of societal relationships with nature and shift the international discourse on conservation priorities (Obura *et al.* 2021). It focuses attention on directly connecting people with nature where they live, highlighting the integration of people with nature, rather than separating people from nature. This is particularly important for low-income contexts in Sub-Saharan Africa, where people depend deeply on nature's benefits, and their prosperity will be undermined if biodiversity loss continues at today's pace.

Box 2. Human-nature interdependencies – the example of the mining sector in Burkina Faso

Many African countries are experiencing a mining boom that considerably stimulates their macroeconomic growth (Bowman *et al.* 2021). However, the explosion of the extractive sector and the multiplication of mining sites, whether industrial or artisanal, are real threats to biodiversity and have a profound impact on the environment over the long term. In Burkina Faso, the extractive sector has grown exponentially since the late 2000s. In 2020, according to the EITI report, the mining sector accounted for 16% of GDP, 83% of export revenues and 50% of net revenues received by the Burkinabe government. However, this exploitation comes with severe damage to the environment and consequently to the health and agropastoral activities of the populations living in the regions affected by mining development.

The Burkinabe Non-Governmental Organization (NGO) ORCADE warned as early as 2006 about the impact of pollution from the Essakane and Poura sites in Burkina Faso, not exploited at this time, where mining waste retention ponds remained open and gradually contaminated the soil and water systems. While a multinational mining company has taken over the Essakane site since the late 2000s,

[3] https://www.newtimes.co.rw/opinions/its-high-time-africa-walks-talk

[4] https://apacongress.africa/download/english-version-of-apac-kigali-call-to-action/

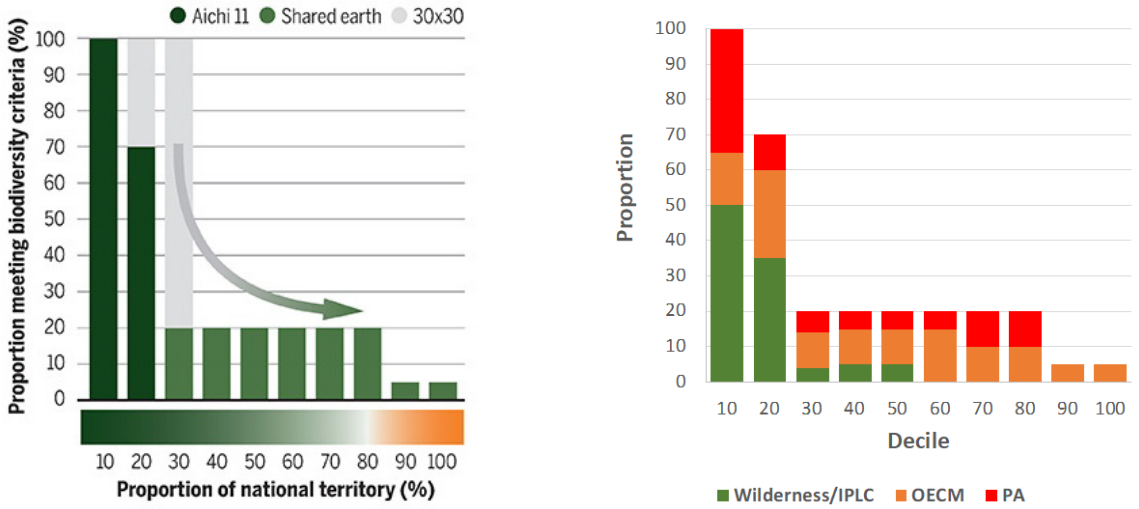
a more recent study covering both the industrial site and the peripheral artisanal mining areas reveals not only high air pollution, with fine particle emissions averaging 35 ton/km^2 compared to the 2.5 ton/km^2/per week as the maximum standard recommended by the International Finance Corporation (Porgo and Gokyay 2017). Porgo et Gokyay (2017) also highlight alarming levels of arsenic concentration in water, above World Health Organization standards. Combined with the deposition of dust throughout the mining perimeter, this pollution significantly impacts the health of the population, as well as the fauna and flora, and even the balance of regional ecosystems (Hubert 2021).

In 2013, a study of 10 major water reservoirs in Burkina Faso highlighted mercury, arsenic and selenium contamination of 70% of the fish analyzed, making them unfit for consumption, and alerted to the quality of the water on which rural populations depend due to the growth of the extractive sector (Ouédraogo and Amyot 2013). A second study, conducted a few years later, confirmed this concern highlighting the contamination of the country's groundwater with arsenic (Bretzler *et al.* 2017). Recent studies have also corroborated the increasing dynamics of Burkinabe rural populations' impoverishment due to mining industries' environmental degradation (Ouoba 2018; Zabsonré, Agbo, and Somé 2018).

The solution proposed is to shift focus from the most remote or ecologically intact places to focus also on "shared spaces" across land and seascapes, in sharp contrast with earlier priorities to focus conservation only on "the best" locations for biodiversity (see prior section). To achieve this, the shared earth/ocean approach is based on four pillars:

- **Prioritize the local scale, and build "from the bottom up"**, aggregating from local to national and larger scales;
- **Address equity and peoples' rights and needs**, to assure people-centred and nature-positive outcomes;
- **Integrate all knowledge at local scales**, **including from local, traditional and scientific sources**, to assure that the local context and granularity of biodiversity and peoples' values and uses are addressed;
- **Address all targets of the GBF concurrently, as an integrated whole**. More broadly, integrate all priority local targets, including those for agriculture and other key sectors, to achieve balance among them all.

Figure 2. The 'shared earth model' illustrated across the territory of a country



Left *The 'shared earth' model illustrated across the territory of a country, in which the targeted area under protection (e.g 30% nationally) is spread over the full extent of a country across 'shared lands' where people farm, fish and rear livestock, thus benefitting the majority of people through agroecological and other sustainable land-use practices across landscapes, simultaneously building up protection in connected networks of protected and intact areas. The gradient bar below the x axis illustrates the condition of biodiversity from intact (left, dark green), through degraded (light green) to fully transformed in cities and intensive farms (orange).*

Right *Illustration of how governance of these protected areas can be diversified to meet local contexts, in a mix of protected areas (PA), other effective conservation measurse (OECM) and other measures appropriate to wildernes and other territories controlled by Indigenous People and Local Communities. From* Obura *et al.* (2021).

The approach advocates that conservation effort should be spread across all areas on land and in the ocean (fig. 2), supported by emerging agreement in the literature that maintaining approximately 20% of area under native habitat can sustainably provide sufficient ecosystem service benefits to local communities and residents, at the same time sustaining many dimensions of biodiversity (Garibaldi *et al.* 2021; Declerck *et al.* 2021; Mohamed *et al.* 2022; Estrada-Carmona *et al.* 2022). A key requirement is that the proportion of area under high quality habitats must be represented at local scales, even down to one km^2, to meet peoples' needs down to this scale; and at this scale complex configurations of natural or semi-natural habitat (e.g. in farm strips, hedgerows, forest patches, etc.) provide critical contributions to both biodiversity and provisioning of benefits to people (Mohamed *et al.* 2022; Estrada-Carmona *et al.* 2022), and provide many synergies with holistic production approaches, such as agroecology (Wezel *et al.* 2020). Further, by being at the local scale the potential for participation, governance and leadership by indigenous people and local communities is maximized. In remote areas where nature is more intact, larger proportions of intact habitat can be counted towards the

target. Aggregating the proportions of intact habitats and natural areas across all landscapes could add up to the increased ambitious target of 30% of protected area coverage under the GBF (fig. 2).

Box 3. Community nurseries to replant mangroves in Cameroon

Mangroves are very significant in Cameroon and contain a wide spectrum of fauna. They face various threats: intense urbanization, agricultural development, use of pesticide and fertilizer, low legislation for mangroves, invasive species, and human activities such as fishing in and around mangroves (UNEP 2007) or timber extraction (Angoni *et al.* 2015). It is estimated from satellite images that Cameroonian mangroves have shrunk by 7% between 2000 and 2015, or 0,5% per year (MINEPDED-RCM 2017). In addition to contributing to the loss of species and the ecosystem, the disappearance of its mangroves intensifies coastal erosion. As a result, public authorities and local communities have joined forces to create 13 community nurseries supported by the NGO Graine de Vie. This has enabled, for example, Campo Beach communities to grow more than 4000 mangrove seedlings to try and build a "green shield" against coastal erosion and wind (UNEP and WCMC 2016). In Bonéndalè in the Wouri estuary, a community nursery was successfully established by NGOs (CEW and WTEG) through engagement and sensitization with the local community (Cameroon and ENVIREP 2010).

This experience is replicated across the other side of the continent in East Africa, with a growing focus on mangroves as a critical ecosystem not just for conservation, but for multiple benefits to people, including coastal protection, providing nursery grounds for fish, fishing for various species including crabs, and provisioning of wood from reforestation programs (Erftemeijer, de Boer, and Hilarides 2022). And on top of this, the knowledge that mangrove forests sequester carbon at higher rates than terrestrial forests is attracting 'blue carbon' finance from carbon markets – directly supporting both reforestation that is beneficial as noted earlier, and injecting finance into local level projects and communities, supporting schools, health centres and other social amenities.

This approach focuses squarely on "working" or "production" land and seascapes, the ecological contributions from nature to people, and the integrity of natural ecosystems that support local use and production, such as in farming, livestock rearing, agroforestry and other approaches. The approach also addresses multiple targets simultaneously, including many of the 23 targets under consideration in the global biodiversity framework such as to simultaneously meet restoration, sustainable exploitation, and benefit sharing targets, while establishing protection areas locally. The approach can also incorporate consideration of targets from other conventions, such as alleviating poverty, meeting food security requirements, reducing disaster vulnerability and exposure, and the overarching framework of the SDGs (fig. 1).

2.2. Convergence between the "shared earth" and commons approaches

The shared earth approach builds on increasing attention being put on rights and livelihoods approaches, and a very strong convergence with the commons approach. This convergence is particularly shown in two types of local institutional contexts, outlined below.

2.2.1. Securing land and natural resource commons

The first situation is when land and natural resources commons (e.g. access to land, or to a forest area, or to a water resource) need to be secured in such a way as to empower actors to fully address the challenges of biodiversity through the "action situations" (Ostrom 1990) they face. A key attribute here is the integration of ecological functioning of landscapes in a socio-ecological systems perspective, and the importance of local social institutions. In this context, natural capital must be integrated from the beginning in the design of management institutions and policies, as well as of economic strategies or supply chains involving the area (Gaidet and Aubert 2019).

The IPBES Global assessment report makes the global statement that "community-led protection and practices of Indigenous peoples and local communities have proved highly effective for the protection of ecosystems through their knowledge, practices and institutions. As evidence of this, biodiversity indicators show declines of 30% less and 30% more slowly in Indigenous lands than in lands not managed by Indigenous people".

In those cases, existing commons of land and natural resources may provide a good basis to build the "shared earth" approach from the bottom up: they could provide the social and organizational basis for the construction of a new "action arena" (Ostrom 1990). In this context different economic actors, at different scales, will interact, debate and decide on what should be the economic strategy for the area based on biodiversity as an assert to be sustained rather than only exploited. As many rural areas in Sub-Saharan African countries will experience rapid transformation due to demographic changes and economic development, one key issue will be how the commons of land and natural resources will be flexible and resilient enough to integrate drivers of change, to cope with the increasing pressures and complexity due to the many dynamics of interaction, as well as with growing uncertainty (Ferraro *et al.* 2015). In particular, in relation to pressures on biodiversity, their ability to integrate new actors who are not local but in a wider supply chain, and who have a major impact on the transformation pathway of the region is key: for example buyers and processors of crops and their influence down the supply chain to the source (see last section).

However there are many cases were local management has not been adequate to prevent degradation of biodiversity (Marchant and Lane 2014). As mentioned in Boche, Leyronas *et al.* (Forthcoming), this is particularly the case when commons of land and natural resources are jeopardized by increasing levels of competition over land and resources between different users, in particular under the pressure of demographic growth and migration, as well as by land reforms based

on ownership rather than on a bundle of access and use rights. The lack of monitoring and evaluation systems capable of evaluating the performance of natural resource management institutions in these contexts is a critical gap.

2.2.2. Developing a "commons approach" in protected biodiversity zones

The second type of situation has a long history of development in biodiversity conservation. "Conservancies" can be defined by community-based management of a protected area, in which local communities are responsible for the protection of biodiversity and also receive the benefits of protection. They often benefit from ecotourism-based revenues based on observation of nature, with the larger question being to what extent economic benefits extend beyond conservancy members to broader rural development. Existing studies suggest this is not always the case, and that policies might need to be put in place to promote more equitable distribution of benefits from a conservancy (Silva and Mosimane 2013). With broader sharing of benefits, community-based conservation efforts could enhance the viability of nature tourism as a rural development strategy within broader landscapes and local government settings. The institutions and social capital within conservancies can be viewed as a foundation on which to build institutions to manage CPR at the broader scale. To succeed, the governance model needs to be designed beyond the scope of the core protected area to the context of the whole landscape and region, and to address the external pressures that relate to commons of land and resource, as presented in the former section.

Box 4. Commons and conservation – plural and hybrid modes of governance

Community conservation developed in the 1980s (Rodary 2008; Bollig 2016), belonging to a semantic constellation that includes, for example, community-based natural resource management, community conservancies, indigenous natural resource management programs, or integrated conservation and development initiatives (Nelson and Agrawal 2008).

According to Campbell and Shackleton (2001), the success of conservancies depends on eight factors: the actual political will of governments to transfer decision-making authority to the local level over the entire bundle of rights; the clarification on the mandates and relationships between the different actors; the integration of natural resource management commissions into decentralized local governments; the representativeness, accountability and transparency of management bodies; the continuity of social engineering over time; the recognition of the place of traditional authorities; the support on the private sector to generate income based on resource use; and the recognition of the created added value to determine the best organizational structure.

Commons and rights-based approaches are also emerging strongly in relation to ocean-dependent communities and livelihoods, with a growing focus on 'blue economy' development particularly in Africa (Okafor-Yarwood *et al.* 2020; Bennett *et al.* 2021; Ruano-Chamorro, Gurney, and Cinner 2022). These focus on community-managed areas with conservation as a core element, building on the

conservancy model, and with the rights and dependence of small scale fishing communities as focus, and paralleling the nine factors cited above.

The Biosphere reserves of the Man and Biosphere (MAB) UNESCO programme also have a lot in common with the shared earth approach. In a biosphere reserve the core protection zone is protected by a transition area designed to prevent intensive extractive activities to develop at the margins of the park that endanger the ecological viability of the landscape. Here, the transition area is intended as an area "where communities foster socio-culturally and ecologically sustainable economic and human activities". These areas could be the nucleus for economic activities and sectors for which the core protected area represents an asset or a capital, the preservation of which is crucial for viability of economic development in the transition area. The experience of MAB is thus unique to understand both the failures and the successes of such an approach, and to what extent the approach could be expanded beyond the biosphere reserve to a whole region or mosaic of landscapes.

The examples presented in this section demonstrate both:

- the existence of a relevant basis of institutions and social capital, in different types of contexts, from which a "shared earth" approach could be developed at local scales, and that serve as a body of experience from which lessons can be drawn;
- the limitations, challenges and failures of existing institutions, due to the complex nature of the local interactions between a changing environment (a change that is accelerated by climate change) and evolving power relations in the local society; the limitations of current institutions are also linked to external structural factors influencing the local landscape, as we will see in the next section.

3. Integrating the bottom up "shared earth" approach into national economies and global supply chains: nested commons and polycentrism

Moving up in scale from the local shared earth-based organization to design a nature- and people-positive economic transformation at larger scales is very challenging.

One of the central features of the "shared earth" approach is to build development projects and governance structures in a subsidiary, bottom-up way. Many of the factors that lead to unsustainable social impacts or overexploitation of resources and degradation of biodiversity are the "underlying causes and indirect drivers", as described by IPBES (2019). The challenge is that many of these are not local in essence, but rather national or global. This is why Leadley *et al.* (2022) and Díaz *et al.* (2020) insist on the need to ensure "structural changes", and not rely only on conservation in protected areas. It implies developing a multi-level approach where "level" refers to units of analysis located at different positions on a given scale. For example, technological progress in water extraction or agricultural

mechanization can have a very negative impact on biodiversity protection, and while they might increase agricultural productivity, they also risk to reduce the level of employment in the agricultural landscapes – an example of some of the foundational trade-offs inherent in the SDGs (Nilsson *et al.* 2018). Such changes are not driven locally, and might not even be regulated. Success in this context requires involving all key stakeholders in value chains, including for example importers of technologies, as well as cooperatives that are distributing them in rural areas.

3.1. From a local landscape approach to regional development

Scaling up from the local level to larger regions necessitates taking into account at least two criteria. The first criterion is the connectivity between protected areas and fragments of intact habitat at the larger (regional) scale, in order to ensure ecological functioning and migratory patterns between them. The second criterion is the carrying capacity of ecosystems and natural resources across the larger region, in order to not overexploit them. This is enhanced by biodiversity and benefits that spill-over from within the protected areas and intact fragments or natural areas, into farmed and utilized areas. These benefits may come in many forms, such as control of pests or pollination for crops, water retention and replenishment of groundwater, or for instance through the nature image associated to a product. There may also be risks for the economic activities adjacent to protected/intact areas, for instance in the case of large mammals destroying crops.

Elinor Ostrom developed the "nesting principle" (Ostrom 1990) for robust governance of large-scale common-pool resources. This principle might inform up-scaling efforts of Sub-Saharan African community-based environmental management beyond the local level in a bottom-up perspective. A nested system is polycentric: it comprises multiple decision-making centres that retain considerable autonomy from one another (V. Ostrom, Tiebout, and Warren 1961). Coordination of decisions across the system relies substantially on collaboration between these multiple centres.

The polycentric approach implies ensuring dedicated fora exist at successively larger scales to negotiate between the different economic players the level of sustainable use of resources and allocate them between the users (Coriat, Gazibo, and Leyronas, Forthcoming). This entails the design of a CPR management system at the scale of the whole region that encompasses the levels below. It also entails ensuring the national government can play the role of "guarantor" that ensures that there is a monitoring and evaluation framework to assess the performance of the CPR management system in reaching its objectives across socioeconomic and biodiversity conservation dimensions. The state should also play a key role to ensure that imbalance of power between different actors in the system does not jeopardize the negotiation through asymmetries, with negative effects on social equity, the state of the environment or both.

Box 5. Addressing the connectivity issue between main protected ecosystems – the example of a project in Kenya

Some experiences of networks of protected areas as the basis for nature positive development of rural regions already exist and need to be analyzed further. For instance, a project funded since 2020 by the French facility for the global environment (FFEM[5]) specifically targets connectivity between protected ecosystems in Kenya, between the Marsabit national park and the Meru conservation area, and at the same time expands the model of conservancies to a larger geographical scale including the network of protected areas and the whole region in which they are embedded. In this case the main challenge is to go beyond the historic focus on ecotourism to more comprehensive local development: it is necessary to be able to design and debate with all the stakeholders in the region to what extent agriculture and livestock production could integrate with conservation of biodiversity both in protected areas and in the rest of the territory. Ensuring social benefits for local populations rather than negative social impacts is extremely critical to this project, and requires particular scrutiny and monitoring, to avoid that imbalances of power, with external players or within the project, lead to unintended outcomes. The challenges in these approaches reinforce the need for a governance framework where the national level can intervene and assess the de facto operation of institutions that are being built.

There are both great potential and significant challenges in developing a "shared earth" approach in which biodiversity conservation is not opposed to, but central to the development of a nature positive transformation pathway to sustainable development in rural regions. In particular, this would need to go beyond the nature tourism sector and even the food sector to also address how other services or industries could be attracted to these regions. This must consider the potential for synergies among sectors, the allure of a positive image thanks to its biodiversity protection, and the quality of life for employees in a well-managed and healthy natural environment. Scenario analyses of potential outcomes of this human-nature synergy, even if and where such scenarios can appear extremely uncertain and not the most probable, suggest it is extremely important to develop such potential pathways starting from biodiversity as a capital and an asset for economic development. If not, the worst case scenario may be encouraged, in which the business as usual scenario of intensive extractive uses overexploiting resources and in the end degrading biodiversity even in the heart of conservation areas, plays out.

3.2. Re-politicizing national policies

National policies in the field of agriculture, infrastructure development or extractive industries play a decisive role in defining the pathways of development at the local or landscape scale. Agricultural policies in Africa, when they are sufficiently developed, are often driven mostly by the need to increase productivity through accessing fertilizers, without taking sufficiently into account the issues of soil

[5] https://www.ffem.fr/en/carte-des-projets/conservancies-working-preserve-kenyan-biodiversity

degradation, biodiversity protection, and the social impact of different types of integration between biodiversity and agriculture in the agroecosystem (Yamaoka 2019). In the cases of Kenya or Ethiopia (Yamaoka 2019; Aubert *et al.* 2017), for instance, the dominance of this productivist model of agricultural development can be partly explained by the configuration of stakeholders involved in the agricultural policy development process. Often, choices made in the scope, objectives and policies are depoliticized, i.e. are taken away from the responsible ministry, and instead assigned to an expert agency using international consultants. These often apply mainstream and capital markets approaches, rather than specifically analysing the needs of different territories in an integrated manner.

In this case, the "shared earth" approach cannot be implemented without a radical redesign of the policy development process, a re-politicization of the agricultural development choices, and responsibility of arbitration resting with the ministry than an execution agency. Further, relevant stakeholders at different levels of governance must be fully engaged in the process: local communities, farmers unions, cooperatives, food processing industries, agricultural technologies suppliers, but also conservation specialists and protected area managers, cities and their utilities. Innovative and compatible approaches across sectors, such as transforming agriculture to agro-ecological principles are also essential (Wezel *et al.* 2020).

3.3. Addressing tension with private extraction rent dynamics

More generally, and this might in particular be the case for extractive industries, there is a tension between the approach of common resources management and private extraction of rent (Boche, Leyronas *et al.*, Forthcoming). The rent seeking or rent capturing players in an economy will have little incentive to participate in a "shared earth" approach. But if they are not included in the governance scheme that decides on an integrated development pattern for landscapes, regions and the national economy, their self-interest will jeopardize any efforts made by the others.

3.4. Global supply chains: Building a knowledge common as a first step

Beyond the national scale, the power to decide, to prescribe, to capture value in global supply chains is often concentrated upstream or mostly downstream of the primary producers of African rural areas and regions. These are not necessarily transnational companies, as there are also powerful economic players and investors in many African countries. A commons approach thus needs also to prevail in these national, regional and often global supply chains, where the governance needs to be fairly shared between downstream and upstream players, rules of contracts need to be clear and just, and information needs to be transparent.

This could seem very far from the reality when considering any global supply chains, except for specific fairtrade examples. The first step in that direction could nevertheless be to consider information along the supply chain as a common good in itself.

At local scales of governance, social sanction and rules can exist and ensure the CPR institutions function. But in global value chains, information about what other players are doing, for instance to know that nobody is cheating over commonly agreed rules, becomes a strategic asset for common objectives and management. This is nothing new for global supply chain management. But in African contexts where generating and accessing data is complex, putting in place strong information systems is very difficult. Developing a commons approach, a shared responsibility approach becomes essential to ensure some form of social control is possible.

Box 6. Cocoa supply chains

Cocoa cultivation, in particular when it is not developed in the framework of agroforestry approaches, leads to the degradation of African biodiversity within the crop plots themselves, and has been also responsible for deforestation through the expansion of the cropped area. During the last decades, the cocoa sector did not adapt to the imperatives of sustainability. It increased production, both by expanding the area and by simplifying production systems to intensify them. This increase of production also maintained a structural overproduction on a global scale (Amiel, Laurans, and Muller 2019). The whole global value chain of cocoa thus needs to transform, in a period where the increase for demand is sharply on the rise, which makes it all the more necessary to avoid any further deforestation and go through a phase of restoration of the complexity, the productivity and also the biodiversity of the cropping systems in place through an agroforestry approach. However, the implementation of this type of action requires being able to trace back the products on the final consumption market in order to account for the impact of its mode of production on the environment. The example of cocoa supply chains is particularly illustrative of the difficulty to ensure traceability of sustainably produced cocoa beans because at one point in the chain, all beans (sustainably produced or not) are mixed in one storage infrastructure. In such a case, strategic data and information to ensure the transformation to sustainability of the whole supply chain is blocked by a technical issue. In other cases, beyond this technical limitation due to the collecting and processing infrastructure, the absence of data collection is the result of a lack of equipment and monitoring capacity. Given the strategic nature of information in contracts all along the supply chain, traceability for sustainability as well as equity in the supply chain could be hampered by intentional asymmetries of information, or by the strategic manipulation of data, of information or of ignorance (strategically excluding data from being monitored), exerted by one specific stakeholder who holds the power over the data and information chain.

The example of the lack of information in the cocoa supply chains shows that sharing information as a common good is both political and structural. It is political because it implies finding an agreement between the different contractors in the supply chain where they would concur that transparency of information is more profitable to all than mobilising asymmetries of information to maximise individual gains. It is also structural as it can also necessitate new structural investments (separate silos for different levels of sustainability) to ensure proper traceability, thus changing the whole technical and contractual structure of the supply chain.

This is then a key limitation and a critical risk to the “shared earth” commons approach. But it nevertheless offers an opportunity to reopen the discussion along global supply chains to enable a commons approach of governance within them. We are now in times when globalization is questioned, because strategic autonomy and security of sourcing becomes a key element for many powerful players, and because many countries or regions seek to retain critical sectors that support their economies, and to also re-shore jobs and employment. This poses a threat to the industrialization pathway for African countries, if jobs are intentionally reshored to the European Union, or Asia, for instance. But it also opens a space for a political negotiation on supply chains and establishment of social contracts between the different players in the chain, ensuring more co-responsibility for not only economic profitability, but also positive social and environmental impact. It also offers Sub-Saharan African countries opportunities to strengthen regional markets and supply chains, with a greater focus on sustainability within production systems and supply chains that are more localized within the continent, and among neighbouring countries and markets. An integrated approach to development and biodiversity through the “shared earth” bottom up approach and through the global supply chains could become one of the key models to be discussed in these moments of renegotiation.

Conclusion

The “shared earth” approach thus appears to open ways to propose new solutions to a problem of collective action at linked scales from local, through regional and national, to international scales. However it faces the critical challenge that the institutions that are needed to function across these scales in a subsidiary, bottom up, and poly-centric way, are weak, and dominated currently by top-down supply chains and governance relations. While this is extremely challenging, it also points squarely to the fact that what is needed are actually “embedded commons”: horizontally interlinked, interweaving local commons with larger regional commons constructed by networking and connectivity among the local commons; as well as vertically embedded, nesting of natural resource management Commons in vertical chains. This is convergent with Ostrom's notion of polycentrism. One of the principles of sustainability of the commons according to Elinor Ostrom is based on the idea that the effectiveness and development of the commons must be part of an institutional framework comprising both the State and the market. Making such “political polycentrism” function is an immense challenge, but it is at the heart of a “shared earth” approach that would be able to better preserve biodiversity and at the same time ensure the transformation of the economy of African countries to prosperity and sustainability.

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