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Transitions and Resilience: Natural Resource Governance Trends in Africa

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African perspectives
Global insights

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Executive summary

Achieving a sustainable future will require that economic growth and development take place without a commensurate increase in waste and demand for natural resources. The COVID-19 pandemic, followed by the conflict in Ukraine, has ushered in a new period of global fragility and instability. The significant social and economic costs of the multiple and interlinked crises facing the world are daunting. Ultimately, however, this period of global flux is a unique opportunity to re-evaluate and reimagine the status quo, including issues around humanity's relationship with nature. There are opportunities for Africa in the current period of flux in power, technology, resource demand and productive capacity, but also significant risks. Africa must position itself to benefit from the new realities shaping the post-COVID order.

Introduction

The COVID-19 pandemic has been one of the most severe and encompassing shocks to global political and economic systems in recent times. The conflict in Ukraine has further exacerbated global fragility and instability. While the social and economic costs of the multiple and interlinked crises facing the world are significant, this period of global flux is also a unique opportunity to reassess the status quo, including issues around humanity's relationship with nature. The climate crisis is accelerating, as are crises related to biodiversity and ecosystem health. At the same time there are pressing social challenges around equality, sustainable livelihoods, inclusivity and employment. With the youngest population of any region, a high level of reliance on natural resources and unique vulnerabilities to climate change, Africa needs ambitious and coordinated action to enhance its resilience and allow it to benefit from major technological, geopolitical and political economy transitions. This policy insight explores some of the key trends that will shape Africa's position within the global order in decades to come.

Decoupling: A systems approach

The International Resources Panel was established by the UN Environment Programme (UNEP) in 2007 with a mandate to build and share the knowledge needed to improve humanity's use of resources worldwide. In one of the panel's early reports it presented the concept of 'decoupling' as the central challenge in the relationship between human development and resource use. For much of history, human development and economic growth have seen a commensurate increase in resource use and waste production.
A sustainable future requires that this relationship be 'decoupled'. There are two elements to this process: resource decoupling, through which production processes become less reliant on physical resource inputs (for example, by substituting fossil fuel-based energy production with renewables) and impact decoupling, through which waste is reduced (for example, through recycling or more efficient production processes).

Decoupling encapsulates the core mechanism underlying various other concepts and processes that speak to the development of more sustainable societies and economies – as UNEP phrased it in a recent seminal report, the imperative for humankind to 'make peace' with nature. Although not entirely interchangeable, language around Green Economy, the green transition, regenerative economy and circular economy reflects the need to decouple human development and economic growth from resource use and waste. Reducing our reliance on natural resources will also allow humanity to create 'space for nature',[1] with the zero draft of the post-2020 global biodiversity framework calling for at least 30% of land and sea areas to be placed under some sort of protection, with 10% under strict protection.[2]

The threat of climate change and the imperative to reduce carbon emissions by transitioning to sustainable energy systems have been the dominant focus of such debates. However, there are also pressing challenges related to other drivers that threaten ecosystem health, including pollution and the role of land-use change in driving biodiversity loss. Each year over 380 million tonnes of plastic is produced and about 8 million tonnes of plastic is released into the oceans.[3] An extensive global assessment by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), published in 2019, found that three-quarters of the land-based environment and about two-thirds of the marine environment have been significantly altered by human actions. Crop and livestock production now account for more than one-third of the world's land surface and nearly three-quarters of freshwater resources. These trends have contributed to extensive biodiversity loss, with around 1 million animal and plant species threatened with extinction.[4] Decoupling therefore relates not only to changing energy systems and reducing carbon emissions but also to shifting to more efficient production systems (including more sustainable agriculture practices), reducing demand on raw materials, and addressing sources of pollution, ranging from plastics to fertiliser runoff. The concept of the circular economy, presented as an approach that looks beyond the predominant 'take-make-waste extractive industrial model', reflects the core principles of decoupling. It does this in its emphasis on taking a new approach to production and design ('designing out' waste and pollution), keeping products and materials in use (through recycling and moving away from single-use and planned obsolescence design) and regenerating natural systems.[5]

Technology will undoubtedly play an important part in the decoupling process. Technological advancements are contributing to a sustained and significant drop in the cost of renewable technologies and improved battery technology to support a shift to renewables and the widespread adoption of electronic vehicles. Major developments in materials science, robotics and a range of other fields also support more sustainable

1 Jonathan Baillie and Ya-Ping Zang, "Space for Nature", Science, September 14, 2018.
2 Convention on Biological Diversity, "Zero Draft of the Post-2020 Global Biodiversity Framework Published by the Secretariat", January 10, 2020.
3 Hannah Richtie, "These Infographics Show How Plastics End Up on the Ocean Floor", World Economic Forum, October 9, 2019.
4 UN Environment Programme, *Making Peace with Nature: A Scientific Blueprint to Tackle the Climate, Biodiversity and Pollution Emergencies* (Nairobi: UNEP, 2021).
5 Ellen MacArthur Foundation, "What is a Circular Economy?", https://www.ellenmacarthurfoundation.org/circular-economy/concept.

production processes. Technological advances allow for more efficient and less polluting agricultural practices. The rapid improvement in and decreasing cost of gene-sequencing technology support research in a range of applications, including the potential application of enzymes found in a strain of bacteria that can consume PET plastics.[6] The transformational aspect and increasing rapidity of technological advances have been captured in the notion of the Fourth Industrial Revolution (4IR). The 4IR denotes the growing fusion of the digital, biological and physical worlds, driven by technologies such as artificial intelligence, cloud computing, robotics, 3D printing, the Internet of Things, and advanced wireless technologies.[7]

Yet, while technology is crucial to developing more sustainable societies and economies, it is no panacea. Indeed, a UN report on the potential of science to contribute to sustainable development warns that 'technological innovations risk further entrenching existing inequalities, introducing new ones and, through unintended consequences, setting back progress towards the 2030 Agenda'.[8] Researchers also caution that an over-reliance on technological fixes to major environmental challenges such as climate change can, in fact, undermine progress in addressing these challenges, as it reduces the sense of urgency and can be used to justify the deferral of important decisions to drive change. In reviewing four decades of political discourse on climate change, researchers recently argued that 'putting our hopes in yet more new technologies is unwise. Instead, cultural, social and political transformation is essential to enable widespread deployment of both behavioural and technological responses to climate change.'[9]

> The COVID-19 pandemic has illustrated both the potential and the limitations of technology in addressing pressing challenges

The COVID-19 pandemic has illustrated both the potential and the limitations of technology in addressing pressing challenges. Remote working arrangements would not be possible without widespread Internet access, a range of virtual work applications and other technological tools. Yet the dramatic differences among countries in managing the spread and impact of the pandemic have largely been shaped by policy responses, behaviour change and 'low-tech' solutions such as mask use and sanitising. Other examples abound. When Cape Town came close to running out of water as a result of drought, its

6 Scott Carpenter, "The Race to Develop Plastic-Eating Bacteria", *Forbes*, March 10, 2021.

7 Njuguna Ndung'u and Landry Signé, "Capturing the Fourth Industrial Revolution: A Regional and National Agenda", Brookings, January 8, 2020.

8 UN, *Global Sustainable Development Report: The Future is Now – Science for Achieving Sustainable Development* (New York: UN, 2019).

9 Lancaster University, "Why Relying on New Technology Won't Save the Planet", *Science Daily*, April 20, 2020.

water usage was reduced by more than half thanks, in large part, to policy responses, demand management, waste reduction, and widespread and dramatic behaviour change. This played a far more important role in averting the crisis than the use of desalination technology, which, even at full capacity, was never able to meet more than 3% of the city's daily water needs.[10]

Systems-level change is needed to address the pressing sustainability challenges facing humanity

The core message of the IPBES global biodiversity assessment, echoed by UNEP's *Making Peace with Nature* report, is that systems-level change is needed to address the pressing sustainability challenges facing humanity. This systems focus is also highlighted in the concept of regenerative cultures, popularised by Daniel Wahl. Wahl argues:[11]

> We need to dare to envision a sustainable world, by re-designing our food systems, transport systems, energy systems, economic systems, and education systems, but most of all, we need to re-envision how we collaborate and how we relate to each other and the natural world.

This is echoed in the IPBES assessment that current economic, policy and behavioural systems are 'eroding the very foundations of our economies, livelihoods, food security, health and quality of life'. This can be addressed through transformative change; that is, 'fundamental, system-wide reorganization across technological, economic and social factors, including paradigms, goals and values'.[12]

A transition in fits and starts

While global energy, technology and production systems are changing towards more sustainable models and technologies, 'dirty' and unsustainable practices still dominate. In 2019, oil, natural gas and coal accounted for 84% of the world's primary energy consumption.[13] While the pandemic has accelerated a drop in fossil fuel investments, over $500 billion was invested in oil and gas supply in 2020[14] and COVID-19 economic recovery

10 Charlotte Edmond, "Cape Town Almost Ran Out of Water. Here's How It Averted the Crisis", World Economic Forum, August 23, 2019.
11 Daniel Wahl, "Albert Bates Reviews 'Designing Regenerative Cultures'", *Design for Sustainability*, June 1, 2017.
12 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, "Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'", Media Release, May 6, 2019.
13 Hannah Ritchie and Max Roser, "Energy Mix", Our World in Data, 2020.
14 International Energy Agency, "World Energy Investment 2020: Key Findings", 2020.

packages have included significant support to fossil fuel industries.[15] The crisis in Ukraine highlights the world's ongoing reliance on oil and natural gas. While the conflict has resulted in Europe's pushing for an accelerated transition to renewable energy, in the short and medium term renewables cannot fill the energy gap, and there is a pressing need to identify alternative sources of gas and oil. While it is an unpalatable reality given the already significant impacts of climate change and ever-more-dire warnings, fossil fuels will likely remain a part of the energy mix for decades to come, even if the growth in renewable energy continues to accelerate.

Nevertheless, energy systems are undeniably moving away from fossil fuels, a trend most apparent in the coal sector. At some point, fossil fuel reserves and infrastructure will become 'stranded'; that is, economically uncompetitive with energy alternatives. The tipping point for the energy transition will not come about as a result of the world's running out of fossil fuels. Even after driving the global economy for more than a century, massive reserves of fossil fuels remain, including unconventional sources such as shale gas and tar sands. Instead, the transition point is a moving target shaped by policy, technology, market pressures and social dynamics. For this reason, trends in shareholder activism, divestment and increasing policy momentum towards carbon neutrality, as well as the integration of climate considerations in trade policy, industrial policy and development assistance, are important signals of broader systemic changes. Uncertainty around the pace of the transition creates significant risks for countries that rely on fossil fuel production to fund government expenditure. States that fail to prepare for this transition face serious economic and social consequences.

In decoupling from fossil fuels by switching to renewable energy sources such as wind and solar, we have not decoupled our reliance on natural resource-based inputs

A further important element in the decoupling debate is that, in decoupling from fossil fuels by switching to renewable energy sources such as wind and solar, we have not decoupled our reliance on natural resource-based inputs, nor the problem of waste. The International Energy Agency (EIA) has highlighted that solar and wind power infrastructure, as well as electric vehicles, require significantly more mineral resource inputs than fossil fuel-based alternatives. The increasing deployment of renewable energy has resulted in the amount of minerals needed per unit of power-generation capacity rising by 50% since 2010.[16] Minerals such as lithium, nickel, cobalt, manganese, graphite, rare earth elements, copper and aluminium are key to renewable energy technologies such as wind turbines,

15 Theresa Smith, "Fossil Fuels Still Get More Investment than Renewable Energy", *ESI Africa*, September 1, 2020.
16 IEA, *The Role of Critical Minerals in Clean Energy Transitions*, Report (Paris: IEA, 2021).

solar panels and batteries. The World Bank estimated that the global energy transition could mean that demand for minerals such as graphite, lithium and cobalt will increase by nearly 500% by 2050, and that over 3 billion tonnes of minerals and metals will be needed to deploy wind, solar and geothermal power, as well as energy storage.[17]

A second component of this problem is the growing issue of e-waste. Over 53 million tonnes of e-waste was produced in 2019 alone and less than 18% of this was recycled. E-waste has been increasing by about 2.5 million tonnes each year, and over 74 million tonnes could be produced annually by 2030. This not only represents an indefensible waste of resources (the e-waste produced in 2019 alone was estimated to contain $57 billion worth of valuable minerals such as gold, copper and platinum), but also poses a health risk. This is particularly the case in in developing countries, where both locally generated and imported e-waste is often handled in informal recycling systems.[18]

Toxic substances found in e-waste such as mercury, brominated flame retardants, chlorofluorocarbons and hydrochlorofluorocarbons are extremely harmful to humans and the environment. Solar panels and batteries pose similar challenges. The EIA estimates that up to 78 million tonnes of solar panels will have reached their end of life by 2050, by which time annual solar e-waste could amount to as much as 6 million tonnes.[19] There were 10 million electric cars on the world's roads in 2020 and, depending on policy choices, this could increase to as many as 230 million by 2030.[20] Recycling, reusing and redesigning batteries and solar panels will be a pressing challenge in the years ahead.

The green transition requires a massive realignment of technological and productive capacity, which has clear implications for the distribution of power

New winners and losers

The green transition requires a massive realignment of technological and productive capacity, which has clear implications for the distribution of power.[21] This is evident in the growing concerns in Europe and the US around China's role as a source of green technology innovation and production capacity, as well as its leverage as the dominant market for critical green minerals such as cobalt and rare earth elements. China is the biggest producer of critical raw materials, as well as the leading importer of such

17 World Bank, "Climate-Smart Mining: Minerals for Climate Action" (Brief, World Bank, Washington DC).
18 Vanessa Forti, "Global Electronic Waste Up 21% in Five Years, and Recycling Isn't Keeping Up", *The Conversation*, July 10, 2020.
19 Maddie Stone, "Solar Panels Are Starting to Die, Leaving Behind Toxic Trash", *Wired*, August 22, 2020.
20 IEA, "Global EV Outlook 2021: Overview", https://www.iea.org/reports/global-ev-outlook-2021?mode=overview.
21 Leslie Hook and Henry Sanderson, "How the Race for Renewable Energy Is Reshaping Global Politics", *Financial Times*, February 4, 2021

materials.[22] It produces more than half of the world's electric cars,[23] and accounts for 80% of global solar cell manufacturing and about one-third of wind power production.[24] It is also the world's largest manufacturer of batteries.

Concern about these issues is not new – it is reflected in the EU's Raw Materials Initiative (2008) and the US executive order on a federal strategy to ensure secure and reliable supplies of critical minerals (2017). The disruptions brought about by the COVID-19 pandemic have only heightened these concerns, as illustrated by the European Parliament's requesting a report on options for reshoring production back to Europe in a globalised economy.[25] In the same vein, US President Joe Biden issued an executive order calling for a whole-of-government approach to assessing vulnerabilities in, and strengthening the resilience of, critical supply chains.[26] These are just some of the signs of a 'push to "reshore" critical industrial green technology, secure the supply of critical minerals, reduce energy interdependence and position states with the capability to benefit from the surge in renewable energy and other green tech innovation'.[27]

African priorities

There are opportunities for Africa in the current period of flux in power, technology, resource demand and productive capacity, but also significant risks. Stranded assets can be enormously disruptive for states that rely on fossil fuel exports for a large part of their foreign exchange earnings and government revenue. Economic shocks can translate into political instability. A just transition that invests in reskilling and creating socio-economic opportunities must ensure that unemployment and economic hardship do not become significant destabilising forces, particularly in the context of Africa's youth bulge. As the world's major powers increasingly focus on a narrow approach to national interest and a move away from multilateralism, Africa risks once again being marginalised, both economically and politically.

A just transition that invests in reskilling and creating socio-economic opportunities must ensure that unemployment and economic hardship do not become significant destabilising forces

22 Michael Penke, "How China's Mines Rule the Market of Critical Raw Materials", *Deutsche Welle*, April 13, 2021.
23 "As China Goes Electric, It Builds a Big Lead in Factories", *New York Times*, September 22, 2021.
24 Kenneth Rapoza, "How China's Solar Industry Is Set Up to Be the New Green OPEC", *Forbes*, March 14, 2021.
25 European Parliament, *Post Covid-19 Value Chains: Options for Reshoring Production Back to Europe in a Globalised Economy*, Study (Brussels: European Parliament, March 2021).
26 The White House, "Biden-Harris Administration Announces Supply Chain Disruptions Task Force to Address Short-Term Supply Chain Discontinuities", Fact Sheet, June 8, 2021.
27 Salim Fakir and Elizabeth Sidiropoulos, "G7 Summit: SA Can Help Strengthen Climate Diplomacy", *Business Live*, June 8, 2021

The Africa region contains significant deposits of minerals that will be key to the green transition. This is likely to result in increased investment, higher commodity prices and more mining jobs. However, in the absence of appropriate, inclusive and transparent governance, negative impacts could also come to the fore, including environmental damage, corruption and conflicts around revenue distribution. There has been a strong push from African states to strengthen the link between mining and industrialisation by promoting value addition of raw materials on the continent. As the world's major powers increasingly compete for green technology production capacity and secure supplies of green minerals, Africa's priorities around value addition and industrialisation could become side-lined.

Africa must position itself to benefit from the new realities shaping the post-COVID order. Renewable energy and green tech can address pressing developmental challenges on the continent, while positioning the region strategically in global value chains and supporting the development of a young workforce with the relevant skills for the new economy. There are also significant opportunities for Africa to achieve social, environmental and climate benefits through working with nature-based solutions. Here too, emphasis should be on how the region can pursue its developmental priorities related to economic growth, jobs and skills development as an integrated part of addressing climate and environmental challenges. Fortunately, there is growing evidence that 'triple wins' that deliver benefits for the environment, society and the economy are possible. There is also increasing momentum in ensuring a supportive policy environment and innovative and appropriate financing mechanisms to deliver such solutions.

How Africa can benefit from the post-COVID order

There are opportunities for Africa in the current period of flux in power, technology, and resource demand, but also risks. The continent can achieve outcomes to benefit both people and the environment if it positions itself strategically.

Opportunity	Risk	How to overcome risk	Ideal outcome
Clean energy	• Climate change impacts accelerate. • Africa marginalised economically due to fossil fuel-reliant production.	• Invest in re-skilling and creating socio-economic opportunities. • Develop regulatory environment that unlocks public and private investment in clean energy.	• A just transition that provides social and environmental benefits.
Green minerals	• Limited benefits from exporting unprocessed minerals. • Governance failures lead to poor outcomes for society and environment.	• Promote value addition. • Strengthen regional value chains and knowledge sharing. • Improve governance.	• Africa becomes a leader in green energy revolution and benefits from green industrialisation.
Green tech	• African competitiveness is undermined. • African economic marginalisation is entrenched.	• Support skills development. • Develop policy and finance instruments to support green entrepreneurship and innovation.	• Africa becomes increasingly globally competitive due to appropriate skills and innovation.
Nature-based solutions	• Toll of climate-related natural hazards increases. • Natural capital underpinning livelihoods is undermined.	• Develop a supportive policy environment and appropriate financing mechanisms.	• Triple win: climate resilience, biodiversity and socio-economic benefits.

Conclusion

The COVID-19 pandemic and the conflict in Ukraine serve as a reminder of the world's interconnectedness. That interconnectedness creates fragility and vulnerability (as evidenced by the rise in fuel prices and heightened food insecurity), yet it is through that same interconnectedness that responses to global challenges are being implemented. Africa's 'paradox of plenty' is often remarked upon – it has a young and dynamic population, vast swathes of arable land and rich mineral resources, yet it remains saddled with pressing developmental challenges, despite notable progress in recent decades. In this period of flux and global realignment, Africa must position itself strategically in order to lay the foundation for sustainable growth and shared prosperity.

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About SAIIA

SAIIA is an independent, non-government think tank whose key strategic objectives are to make effective input into public policy, and to encourage wider and more informed debate on international affairs, with particular emphasis on African issues and concerns.

SAIIA's policy insights are situation analysis papers intended for policymakers, whether in government or business. They are designed to bridge the space between policy briefings and occasional papers.

Cover image

Member of the Community Forest Association, Zeinab Leboiyare, 24, (right), harvests honey at the edge of the Kirisia forest on August 16, 2021, near the town of Maralal in Samburu, Kenya. As drought disrupts the traditional way of life of pastoralists, these community projects have the potential to empower women and lift entire communities in sub-Saharan Africa out of poverty. "I'am proud to know that I can make a difference in protecting this forest. Before we did not know the importance of taking care of these trees but now, with climate change making droughts ever worst year by year, we are starting to understand that we have to take matters into our own hands if we want to protect our environment." (Siegfried Modola/ Getty Images)

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