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Exogenous shocks and commodity dependence: how diversification can fuel the green economy in Africa

Policy paper

Abstract

A diversified set of exported goods is one indicator that an economy has transitioned from concentration on a narrow basket of primary commodities to higher value and more resilient industries and services. This process of economic transformation is high on the African policy agenda and links closely with a shift to a green economy, harnessing renewable energy and producing new goods for the global green transition. From 2018 to 2020, Africa witnessed a notable decrease in its export concentration index, which could be a good sign of this transformation.

The present policy paper provides an examination of whether this transformation was indeed the force behind the fall in export concentration. It acknowledges that the impact of the coronavirus disease (COVID-19) pandemic on some traditional exports, along with the rise in the value of gold exports in particular, have driven many visible trade trends, which speak more to continued commodity dependence rather than transformation. These trends shed light on the many links between the region's current state of dependence and the implementation of policies intended to spur green commodity-based value addition in upstream and downstream industries.

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I. Introduction

Industrialization and economic diversification have been priority areas for policymakers in Africa ever since independence. African countries have aspired to diversify away from raw commodities, which are characterized by limited returns and vulnerability to global price swings, to invest in higher value-added activities that generate greater export and foreign exchange earnings, revenue, and more secure high-wage jobs, with a view to structural transformation of the economy. To date, however, Africa has had a mixed record with these aspirations. According to the Economic Commission for Africa (ECA), while some countries and firms have emerged as global leaders, many have remained dependent on a basket of lower value-added agricultural, fossil fuel and mineral products to drive economic growth, with primary unprocessed commodities still accounting for 70 per cent of the region's export basket (ECA, 2021). This is evident in measures such as the Herfindahl-Hirschman index of market concentration or diversification, which, when applied to trade flows, reveals a higher concentration in Africa as a whole and in individual African countries, relative to countries in other parts of the world (United Nations Conference on Trade and Development (UNCTAD) Stat, 2023).

Countries have increasingly linked their policy aims and objectives with parallel goals for inclusive and sustainable socioeconomic development. This has involved incorporating the tenets of both the 2030 Agenda for Sustainable Development and Agenda 2063: The Africa We Want, of the African Union. While the region accounts for a little more than 3 per cent of global greenhouse gas emissions, it is especially vulnerable to the impact of climate change, through more severe and prolonged droughts, storms, changing sea levels and other climatic events (ECA, 2021). Accordingly, it is in the region's collective interest to seek greener means to grow and industrialize, and to pursue the difficult but necessary twin aims of protecting local environments while improving livelihoods in communities that hold significant natural resources.

There are immense opportunities to link this green agenda and its ultimate objective of structural transformation, with booming demand for products that are key to the green economy – such as materials for clean energy production and storage – that rely on African inputs. It is, therefore, imperative for African countries to move into higher segments of value chains for these products. The African Continental Free Trade Area provides a further opportunity to unlock intra-African trade, which is more diversified and based on industrial goods than the continent's exports to external partners (ECA, 2016).

The direct and indirect impacts of the COVID-19 pandemic have derailed much of the progress made towards sustainable development and transformation, both globally and in Africa. The effects have been ubiquitous, across indicators of health, economic performance, poverty and environmental protection. In Africa, some impacts, including on export diversification and concentration, were very significant and revealed much about the structural strengths and weaknesses of countries prior to the pandemic.

The present paper provides an examination of the marked effects of the pandemic in terms of export diversification, to determine whether diversification or concentration of African exports has occurred in specific countries and for specific commodities, and if so, what has been the driving force behind it and the implications for the region's economic and climate goals.

The present paper is set out in eight sections, with section I providing an introduction and context to the study. Section II contains a summary of the impact that COVID-19 has had on the sustainable development paradigm in Africa. Section III provides an introduction to the role of industry and trade in the region's green agenda. Section IV sets out the methodology used in the analysis. Section V presents an analysis of the data on export concentration and section VI provides a discussion on these findings, especially regarding commodity dependence. Section VII contains an exploration of the policy options for harnessing trends to instil sustainable development and transformation. Section VIII provides a conclusion to the study.

II. Impact of the pandemic on sustainable development in Africa

The severe impacts of the COVID-19 pandemic were felt across all corners of the world and in all sectors of the global economy. Africa experienced both short-term effects of the pandemic and lockdown procedures, along with the long-term effects that reverberated across supply chains, commodity markets and beyond. ECA (2022a) estimated that gross domestic product (GDP) in African countries contracted by an average of 3.2 per cent in 2020 as a result of COVID-19, and that it might take until 2024 to restore the continent's fiscal deficits to pre-pandemic levels, an aspiration which is still subject to ongoing global uncertainty and constrained availability of financing.

Global trade has been a major channel for the transmission of the effects of the pandemic to the global economy, with the World Trade Organization (2021) measuring a 9.6 per cent fall in the trade of goods and services in 2020, nearly three times larger than the contraction in global GDP. Yet trade experienced a strong rebound in 2021, especially for merchandise trade and in countries with strong trade linkages and fewer COVID-19 cases. These events reflect how the interconnectivity of global supply chains makes the world both more vulnerable to the effects of shocks and more resilient to such shocks once they occur, with substantial implications for global supply chains.

Tourism was a major sector through which African exports, foreign exchange, incomes and livelihoods were affected. Before the pandemic, tourism and hospitality accounted for 8.5 per cent of GDP, 6.7 per cent of employment and 30 per cent of services exports in 2018 (World Trade Organization, 2021). Such high dependence and the complete shutdown in global travel led to an 11.5 per cent drop in GDP growth in tourism-dependent countries in Africa in 2020 (African Development Bank, 2021).

Regarding the wide socioeconomic impact of COVID-19, ECA (2022a) found that an estimated 55 million Africans were pushed into poverty by the pandemic, reversing more than two decades of progress in reducing poverty. This has affected women and girls in particular, with a higher proportion of women stopping work because of the pandemic in many of the African case-study countries (African Development Bank, 2021). The African Development Bank has constructed an economic vulnerability index, according to which 31 African countries are classified as vulnerable, and has noted that addressing export concentration is one means to improve the ability of countries to absorb shocks.

The pandemic has also significantly affected the continent's trajectory towards its sustainable development targets, as measured by the 2030 Agenda and Agenda 2063. Before 2020, the region was already not on track to achieve those targets due to a combination of slow growth, limited fiscal space and the impact of climate change. Climate events had already caused a loss of GDP in African economies of 3–5 per cent (ECA, 2021). For example, sea levels are rising in Africa at 2 millimetres more per year than the global average, and Africa lost 2 percentage points of forest cover during the period 2000–2015, compared with a 0.5 percentage point loss globally (World Meteorological Organization, 2019; ECA, 2016). As of 2019, African countries had not achieved the interim progress envisioned towards any of the 17 Sustainable Development Goals; in fact, in respect of Goals 10, 13 and 16, African countries had witnessed reversals (ECA, 2022b). In addition, COVID-19 and the ongoing war in Ukraine have added a new host of vulnerabilities, including higher food and fuel prices, expanded social and human spending needs, alongside limited fiscal space, increased indebtedness and greater vulnerability to global interest rate hikes.

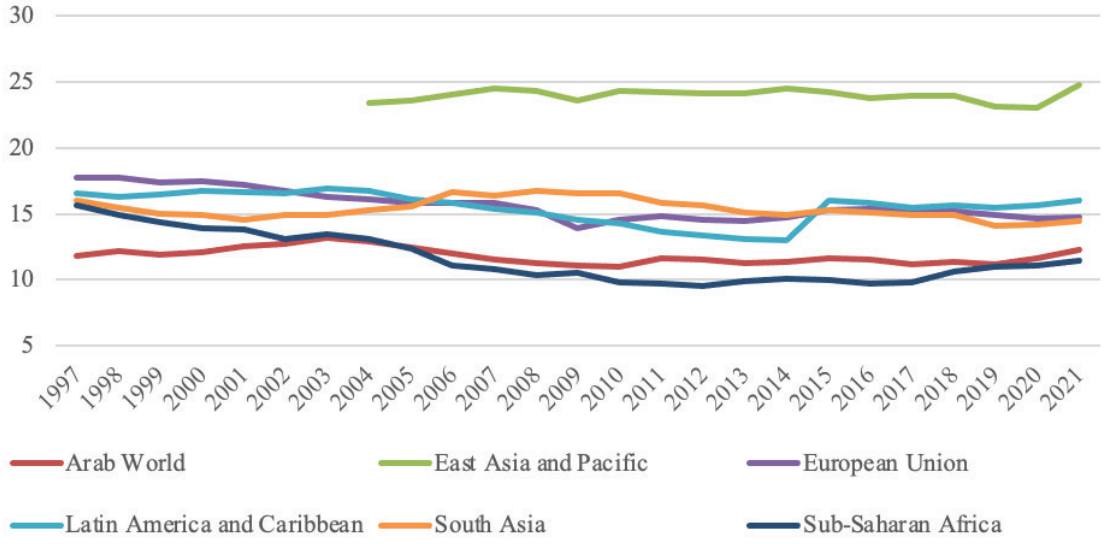
III. Role of industry, natural resources and trade in the African green agenda

Economic and financial constraints have consequences for investment in the green economy in Africa, which is needed to scale up new activities, boost productivity, create jobs and ensure natural capital sustainability (ECA, 2021). Green infrastructure can bring about large increases in income and can be employment multipliers, with estimates that clean energy infrastructure can create twice as many jobs per dollar as fossil-fuel investment (ibid). Batini and others (2021) estimated the multipliers from green spending to be 2 to 7 times larger than from non-eco-friendly spending, depending on the sector. Many specific examples have been cited in the literature, including by O'Callaghan, Bird and Murdoch (2021), who estimated that if the Democratic Republic of the Congo incorporated green initiatives into its COVID-19 recovery, it could yield 130 per cent more jobs and 280 per cent more economic output than traditional investment.

Industrialization has long been at the top of African policymakers' agenda to drive the continent towards a structural transformation characterized by diversified economies and higher incomes. New industries that produce a variety of goods with higher market prices and that are less concentrated and subject to global price swings are key to absorbing labour market entrants, and ultimately, to generating more foreign exchange and taxable earnings to reinvest in a virtuous cycle of transformation, a process witnessed in both industrialized countries and in countries undergoing industrialization (Rodrik, 2011; Sloan, 2020).

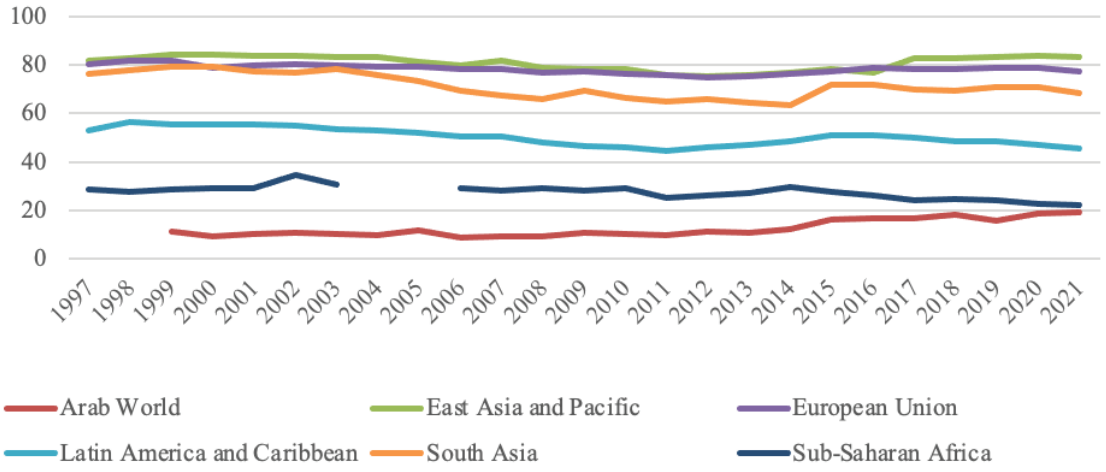
Figure I shows regions such as East Asia and the Pacific have maintained high proportions of manufacturing value added as a percentage of GDP, and figure II shows East Asia and the Pacific, the European Union and South Asia with high proportions of manufactured exports in their total exports. These are two indicators of large and developed manufacturing sectors. Meanwhile, Africa features a notably lower level of manufacturing value added as a percentage of merchandise exports. The focus here is on manufacturing, especially since broader data on industry capture primary extractive activities such as oil and mining, which do not reflect the desired diversification and value addition.

Figure I: Manufacturing value added as a proportion of gross domestic product (Percentage)



Source: Authors' calculations, based on the World Development Indicators (Washington, D.C., World Bank, 2023).

Figure II: Manufactured exports as a proportion of merchandise exports (Percentage)



Source: Authors' calculations, based on the World Development Indicators (Washington, D.C., World Bank, 2023).
Note: Gaps in the graph are due to gaps in the corresponding data.

Hesse (2008) observed that the process of diversification is especially crucial for developing economies. It has long been noted (by such authors as Prebisch (1950) and Dos Santos (1970)) that countries in the global South need to build new competitive advantages in higher-value goods in order to industrialize, develop and break free from what they viewed as global economic dependency. Such counsel went against conventional policy advice at the time that countries should focus on comparative advantages in low-value raw commodities. As recently acknowledged by the World Trade Organization (2021), "if a country's exports are concentrated in a few products, countries are more vulnerable to a drop in demand for these products".

Another significant issue is the large allocation of resources and investment needed to spur capital-intensive sectors, which require a central role for the State through industrial policy (Hirschman, 1981, Chang, 2002). The role of the State and of major investors should be underscored in the context of the transition to a green economy. The costs of investing in environmentally friendly activities, transitioning to carbon-neutral production and adopting renewable energy, have all often been cited as significant impediments to switching away from fossil fuel-based production methods. Given that Africa has contributed little more than 3 per cent of total greenhouse gas emissions, and that new industries and more energy output will be vital to the continent's transformation, policymakers have questioned the urgency and practicality of making such green investment. Considering that African countries already spend between 2 per cent and 9 per cent of GDP to adapt to and mitigate against climate-related events (ECA, 2021), the expenditure that is under way would be more efficiently spent on creating new jobs and opportunities while also helping to address climate change. Furthermore, many green economy activities provide win-wins for the environment and the economy – as noted in the examples above – in terms of growth and job creation.

One link between green investment and industry-based development involves the use and transformation of African mineral endowments, which play a key role in the global green transition. Africa holds up to one third of the world's mineral reserves, is the source of a majority of the world's cobalt (71 per cent), manganese (53 per cent) and platinum group metals (53 per cent), and is a significant source of many other minerals (Kitaw and Sloan, 2023). In such mining-based economies as the Democratic Republic of the Congo, Guinea and Zambia, minerals account for more than 70 per cent of exports and 20 per cent government revenue, but less than 10 per cent of employment due to the low job-creating elasticities of the sector, a situation that arises from the extraction and export of minerals in their raw form, with limited processing or value addition. As the population of the continent grows and urbanizes,[1] young people will need good and reliable jobs. This is a priority for policymakers and underscores the need to examine all sectors, including natural resources, to determine how or whether they can contribute to meaningful job creation.

In 2009, African countries adopted the Africa Mining Vision as a blueprint for the "transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socioeconomic development" (African Union, 2009).

By investing in the production and processing of minerals for the green economy, African countries can address both aspirations for industrialization and contribute to the energy transition. That is to say, renewable energy generation and storage will lead to an estimated increase of 500 per cent in demand for copper, cobalt, nickel, lithium and other African key "green minerals" by 2050 (World Bank, 2020). This presents a significant opportunity to harness unprecedented demand and prices for African exports and to negotiate for external mining partners to transfer to African countries a greater share of value addition in the green mineral value chain.

As these higher value activities are promoted and new activities supported to generate large-scale increases in exports, the expansion and deepening of trade that will be part of the African Continental Free Trade Area can have intervening positive and negative implications for emissions and climate change. Greater production, economic activity and shipping can increase emissions, but trade and cooperation can lead to the dissemination of more carbon-friendly technologies (World

1 Africa is currently the fastest urbanizing region in the world, where half of the population will live in cities by 2040.

Trade Organization, 2021). In addressing this, a host of partners, including ECA and UNCTAD, have underscored the importance of national strategies to "green" the African Continental Free Trade Area. There is an added advantage of localizing segments of global value chains and promoting regional value chains, which can reduce the emissions arising from global shipping while yielding new opportunities for the continent.

IV. Methodology

At the nexus of these pressing issues, one often-cited measure (as a proxy for industry and transformation) involves export concentration and diversification. By examining the makeup of a country's trade basket and the extent to which it is composed of either only a few goods or a broad range of goods, one can determine how diversified or dependent the country is on a certain number of products. As noted by Bajaj and others (2022), of the many measures of export diversification and concentration, the Herfindahl-Hirschman Index, which is the sum of the squares of the share of each sector or product in total exports, is the most robust and comprehensive of the available measures.

The study employed the Herfindahl-Hirschman Index, as presented in UNCTADstat data, to measure the level of export diversification globally, in Africa as a whole, in specific African countries, and in comparator regions and countries, both before the COVID-19 pandemic and after. It focused on export concentration to illustrate the reliance – or lack thereof – on a small basket of goods, typified in the African context by raw commodities in the mineral, fossil fuel and agricultural sectors. This concentration was measured on a scale from 0 to 1, with 0 representing a completely diversified export basket and 1 representing full concentration.

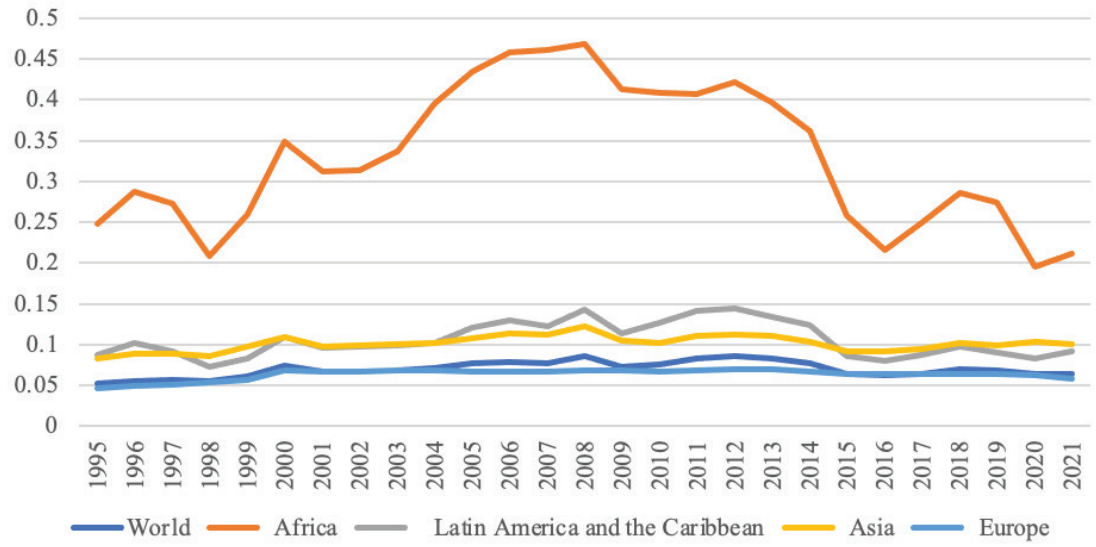
Quantitative data and qualitative observations of some specific sectors and exports in question were drawn on to fully assess the broad figures for the Herfindahl-Hirschman Index and to delve into the drivers of these trends in Africa. This allowed for an analysis, firstly of the trends in export diversification before the pandemic, secondly of the impact of the pandemic on this drive for diversification, and thirdly of the measures that can both encourage the deepening and diversification of industries in Africa and contribute to the global fight against climate change.

V. Analysis

A first step is to examine the broad trends in export concentration in Africa as compared with other regions; figure III provides an illustration of this for the past 25 years.[2] The significantly higher level of export concentration is more notable in Africa than elsewhere. It ballooned during the commodity super cycle of the early 2000s, during which time the world in general experienced a more muted rise in concentration. The level of export concentration in Africa fell with the winding down of this supercycle.

2 Timeframe chosen due to data availability.

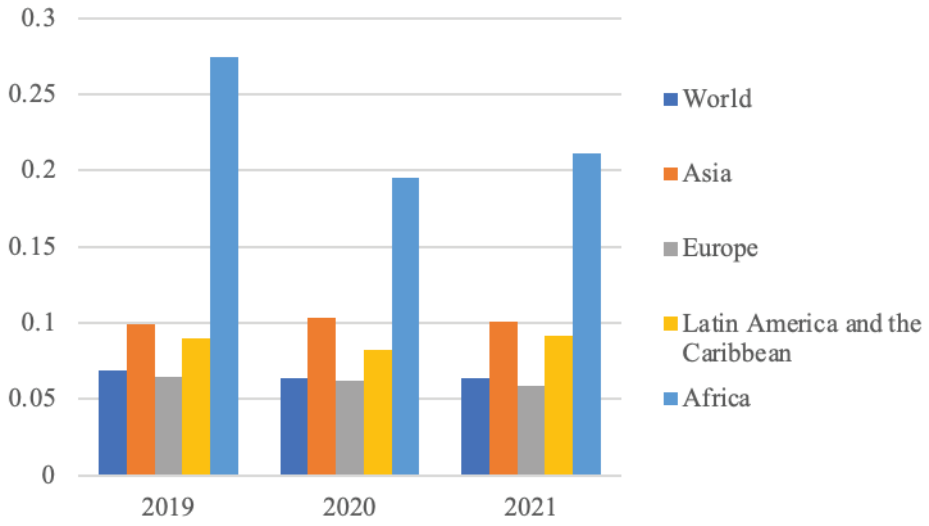
Figure III: Concentration index, by region, 1995–2021



Source: Authors' calculations based on UNCTAD Stat (2023).

Another interesting trend is the fall in concentration that occurred in Africa in 2020 (see figure III) and the slight rebound that began in 2021. Figure IV focuses on this trend to illustrate the magnitude of the change witnessed following the onset of the COVID-19 pandemic. A significant fall (or rise) is defined by a change in the concentration index of 0.05 index points or more, to distinguish the change from other small rises and falls.

Figure IV: Concentration index, by region, 2019–2021



Source: Authors' calculations based on UNCTAD Stat (2023).

Equally noticeable in figure IV is the scale of the fall in Africa, in particular in comparison with other regions (a decline from an index of 0.275 to 0.195 in 2020). Given that the index is computed for Africa as a whole, a focus on the trends in each national economy is warranted to examine what is driving the aggregate fall in concentration. Notwithstanding the broad fall in concentration,

several Africa countries in fact witnessed increased export concentration during the pandemic. Table 1 outlines those countries that witnessed a rise or fall in concentration from 2019 to 2020 using the 0.05-point threshold.

Table 1: African countries witnessing rise or fall in export concentration, 2019–2020

Decreasing concentration		Increasing concentration	
Country	Amount	Country	Amount
Cabo Verde	-0.07	Burkina Faso	+0.12
Gambia	-0.08	Democratic Republic of the Congo	+0.05
Libya	-0.11	Mali	+0.05
Sao Tome and Principe	-0.16	Niger	+0.21
Togo	-0.11	Rwanda	+0.13
		Uganda	+0.05

Source: Author's calculations based on UNCTAD Stat (2023).

Having identified the countries with increasing or decreasing concentration, a deeper analysis of what is driving these trends will focus on the change in the composition of each country's specific exports between 2019 and 2020. The Observatory of Economic Complexity provides a breakdown of a country's export and import basket, in absolute value and as a share of total exports and imports. Using such data, one can determine which goods experienced a decrease or increase as a share of total exports, with a view to examining the trends may be influencing the changes in concentration. This will first involve an individual assessment of each country that experienced export diversification during the pandemic. Table 2 displays the total value of each[3] of the countries' top five exports as measured at level 4 of the Harmonized Commodity Description and Coding System (HS) and its share of total exports as of 2018, and then illustrates these trends to 2020.

Table 2: Changes in export composition of main exported products for countries that experienced export diversification in 2020

		2018	2019	2020
Libya	**Product as percentage of exports**			
	Crude oil	83.3	80.0	64.5
	Petroleum gas	8.68	11.8	9.73
	Refined petroleum	3.56	3.23	1.15
	Gold	2.57	3.66	19.1
	Scrap copper	0.31	0.19	1.13
	Export concentration	0.856644	0.823448	0.71385
	Value of all exports[a]	31.3	32.6	8.66
Gambia	Product as percentage of exports			
	Coconuts, Brazil nuts, cashews	30.9	13.1	7.97
	Rough wood	11.2	18.9	2.01
	Non-fillet frozen fish	8.22	2.45	6.01
	Refined petroleum	5.85	4.23	0.04
	Gold	0.35	27.8	59.8
	Export concentration	0.285381	0.307568	0.227792
	Value of all exports[a]	0.119	0.246	0.359

3 Cabo Verde and Sao Tome were omitted owing to small relative trade flows and other sectoral compositions as compared with other countries.

		2018	2019	2020
Togo	**Product as percentage of exports**			
	Refined petroleum	43	32.8	23.1
	Gold	11.4	2.0	2.83
	Calcium phosphates	4.49	4.85	6.93
	Crude petroleum	4.0	7.99	1.62
	Cement	3.44	3.68	5.68
	Export concentration	0.359188	0.30172	0.192646
	Value of all exports[a]	3.26	2.34	1.84

Source: Observatory of Economic Complexity (2022); UNCTAD Stat (2023).

[a] *Billions of United States dollars.*

A significant fall in the share of the main export of each country (e.g. crude oil in the case of Libya) as a share of total exports is notable. Given the role of that main export in determining the degree of concentration of each export basket, the fall in the main export's share in the export basket significantly lowered the country's export concentration index. For these countries, the fall in export concentration in 2020 does not reflect the diversification of economic activity through industrialization, but rather the vulnerability the countries to variability in the markets for raw and primary exports, as well as the visible impact of the collapse in trade of these goods due to pandemic-related disturbances. This is particularly notable for Libya, where from 2019 to 2020 crude oil exports fell from 1,100,000 million barrels to 350,000 barrels per day, with its share of total exports also falling from 80 per cent to 65 per cent (Energy Information Administration, 2022; Observatory of Economic Complexity, 2022).

If this is the case, then a next question is why other countries with similar pre-COVID dependence on a small basket of raw material exports did not witness a similar perceived diversification as a result of the collapse in the trade of such products. For comparison, while Algeria, Angola and Nigeria are all also commodity-dependent exporters, none of them experienced measurable diversification (see table 3). It is interesting to note that Angola and Nigeria were able to continue the export of crude petroleum in roughly the same proportion of total exports in 2020.

As with the countries that are the subject of table 2, while the value of total exports of Algeria, Angola and Nigeria witnessed a significant drop in general, the share of goods in the export baskets of the latter remained relatively constant, thereby maintaining a stable level of export concentration.

Table 3: Export concentration of other commodity-dependent exporters

		2018	2019	2020
Algeria	**Product as percentage of exports**			
	Crude petroleum	39.6	40.0	40.4
	Petroleum gas	36.2	34.0	31.2
	Refined petroleum	18.2	18.8	17.9
	Nitrogenous fertilizers	2.13	2.34	4.02
	Ammonia	1.19	0.97	1.02
	Export concentration	0.483077	0.469802	0.443313
	Value of all exports [a]	38.4	33.2	20.1
Angola	Product as percentage of exports			
	Crude petroleum	82.8	83.8	79.6
	Diamonds	5.92	7.71	10.4
	Petroleum gas	4.72	4.75	6.05
	Refined petroleum	1.15	1.28	1.47
	Passenger and cargo ships	1.12	0.37	0.042
	Export concentration	0.862249	0.894797	0.873198
	Value of all exports [a]	44.8	37.2	23.8
Nigeria	Product as percentage of exports			
	Crude petroleum	74.3	71.9	71.0
	Petroleum gas	13.5	12.2	13.7
	Tug boats	1.9	0	0.08
	Refined petroleum	1.39	0.79	1.42
	Gold	0.95	0.54	0.51
	Export concentration	0.786345	0.785834	0.741563
	Value of all exports [a]	63.1	64	43.1

Source: Observatory of Economic Complexity (2022); UNCTAD Stat (2023).

[a] *Billions of United States dollars.*

The above findings for these comparator countries warrant an examination of the other products exported by the Gambia, Libya and Togo to see what role they played in bringing about the perceived diversification in 2020. A second notable trend becomes clear in table 2: the dramatic rise in the share of gold, which rose from less than 5 per cent of total exports in Libya and the Gambia, to 19.1 per cent and 59.8 per cent, respectively (the proportion fell for Togo). Thus, a simultaneous collapse in trade for most goods, coupled with the boom in the trade of one product (gold) brought about the perceived diversification.

The role that gold plays in influencing export data is even more apparent in countries that experienced an increase in export concentration during the pandemic (see table 4). Gold was already the largest export of Burkina Faso, Mali, the Niger, Rwanda and Uganda before its price rose and the pandemic affected the trade of other goods, which led to an extreme increase in the share of gold in total exports by 2020. When discussing gold producers in Africa, a notably absent country in this analysis is South Africa, where stringent lockdowns led to a fall in the value of gold exports, from $17 billion in 2019 to $13.1 billion in 2020, despite the rise in gold price (Observatory of Economic Complexity, 2022). Another absent country is Ghana, for which the Observatory of Economic Complexity lacks product-level data.

Table 4: Changes in export composition for countries that experienced an increase in export concentration in 2020

		2018	2019	2020
Burkina Faso	**Product as percentage of exports**			
	Gold	75.7	77.5	87.8
	Raw cotton	5.7	6.53	3.31
	Coconuts, Brazil nuts and cashews	3.83	1.9	1.17
	Zinc ore	3.46	2.9	2.44
	Other oily seeds	3.36	2.7	1.78
	Export concentration	0.692138	0.716986	0.833298
	Value of all exports [a]	5.67	6.09	8.26
Democratic Republic of the Congo	**Product as percentage of exports**			
	Refined copper	46.2	63.1	57.7
	Cobalt	19	12.1	12.7
	Cobalt oxides and hydroxides	11.8	7.77	15.6
	Copper ore	7.23	3.61	1.31
	Cobalt ore	3.11	1.15	0.66
	Export concentration	0.46861	0.524578	0.574018
	Value of all exports [a]	18.1	16.1	18.9
Mali	**Product as percentage of exports**			
	Gold	75.2	78.8	93.6
	Prepared cotton	10.3	7.27	0
	Bovine	2.81	2.59	0
	Raw cotton	2.01	1.67	0.91
	Export concentration	0.717362	0.788438	0.842352
	Value of all exports [a]	4.58	5.8	5.02
Niger	**Product as percentage of exports**			
	Gold	18.4	31.7	67.3
	Palm oil	16.2	3.83	0.58
	Refined petroleum	14.4	15.1	7.9
	Rice	13.3	0.34	0
	Other oily seeds	9.39	14.9	8.53
	Uranium and thorium ore	1.13	15.7	2.93
	Export concentration	0.299917	0.346236	0.554112
	Value of all exports [a]	1.66	1.44	2.63
Rwanda	**Product as percentage of exports**			
	Gold	43.9	36.1	47.2
	Niobium, tantalum, vanadium and zirconium ore	8.13	5.05	3.64
	Tin ores	5.28	5.45	2.96
	Coffee	5.03	6.35	5.41
	Tea	4.59	5.4	6.18
	Export concentration	0.415368	0.434071	0.566876
	Value of all exports [a]	1.62	1.32	1.37

		2018	2019	2020
Uganda	**Product as percentage of exports**			
	Gold	38.6	41.5	59
	Coffee	11.5	11	9.13
	Dried legumes	2.43	0.94	0.63
	Fish fillets	2.42	2.37	1.12
	Corn	2.25	1.26	0.88
	Export concentration	0.27029	0.376602	0.42662
	Value of all exports [a]	4.26	4.11	5.88

Source: Observatory of Economic Complexity (2022); UNCTAD Stat (2023).

[a] *Billions of United States dollars.*

VI. Gold as a cash-cow but with limited contribution to sustainable development

Gold has had this marked intervening impact on export baskets because of the rise in its market price in recent years, from an average of $1,269 per troy ounce in 2018 to $1,393 in 2019 and $1,770 in 2020, peaking at $1,902 on 24 July 2020 (World Bank, 2022; Koh and Baffes, 2020). This was driven by demand for safe-haven assets during crises and uncertainty (Koh and Baffes, 2020), with gold viewed as being insulated from uncertainty, inflation and exogenous shocks (Denham, 2020). While other mineral prices and demand have undergone global fluctuations in recent years because of the volatility of the sector, commodity cycles and supercycles, this unique trait of gold has caused it to have a greater impact on trade and industry indicators than other metals and minerals. This can be witnessed, for example, in the smaller increases in the shares of specific metals and minerals in the export basket of the Democratic Republic of the Congo; while they do fluctuate, they lack the dramatic increase witnessed for gold in other countries. The safe-haven quality of gold is distinct even when compared with other precious metals such as silver and platinum (Gajigo and Ahadjie, 2020).

Upon closer inspection, the major COVID-related change in export concentration – whether an increase or decrease – has been significantly influenced by two global phenomena: the collapse of oil and the rise of gold. Macleod and Guepie (2023) provides a clear illustration of price developments for the continent's top exports during the COVID-19 pandemic. From a base index of 100 in December 2019, brent crude fell to a low of 30 by April 2020, with gold peaking at 130 in July 2020. These two forces alter the traditional interpretation of a decrease in export concentration as a positive development that bodes well for higher value-added activities associated with the development of industry and services and overall structural transformation. On the contrary, they reflect the impact of crises on countries that rely heavily on a narrow selection of raw commodities.

The gold sector itself suffers from the typical limited linkages with the broader economy and low employment elasticities that often plague the mineral and extractives sectors in general. Gold continues to occupy a major share of economic activity in its main producers in Africa, but with diminishing returns in terms of development indicators. For example, while mining – with gold

the primary contributor – accounts for nearly 50 per cent of Ghanian exports, this share falls to 22 per cent for government revenue, 6.8 per cent of GDP, and only 2 per cent of formal employment (African Minerals Development Centre, 2018). Similarly, in Mali, gold accounts for 65 per cent of exports but only 20 per cent of government revenue and 6.5 per cent of GDP (Gajigo and Ahadjie, 2020). Meanwhile, royalty rates in many gold mining contracts are low, which limit the accrual of government revenue from such mining even in boom times. Thus, growth in exports that is driven by exports of gold holds less potential than other higher value-added activities for transformative job creation.

A closer examination of the role of gold in some of these case studies reveals some unique findings regarding processing and export trends. Such countries as the Gambia, Rwanda and Uganda are not typically considered among the continent's leading gold producers. In the case of Uganda, however, it is home to a major East African gold refinery, the African Gold Refinery Limited, which processes gold from across that subregion. By contrast, Ghana has only recently planned to commission its first gold refinery as a joint venture between the Government and an Indian private sector partner, which was set to commence operations in August 2022 (African Mining Market, 2022). The examination of Gambian gold exports revealed Uganda to be by far the largest destination for those exports. This mirrors larger trends in the re-exportation of gold; while some of it has been documented as legitimate imports, a substantial proportion of it is likely to have been supplied through off-the-books and illegally smuggled imports, namely from the Democratic Republic of the Congo (Neiman, 2021).

It has been well documented that the extractive-sectors are the leading contributors to illicit financial flows from Africa, estimated at more than $80 billion annually. Smuggling of extractive-sector products deprives African countries of the resources needed to invest in sustainable development and economic transformation (African Minerals Development Centre, 2017a). Gold is especially vulnerable to smuggling and the illicit involvement of such parties in its mining and export as African Gold Refinery, which has been sanctioned internationally and taxed nationally because of its alleged role in smuggling activities.

Beyond this aspect of illegality, the major involvement of a country as a re-exporter of goods further undermines the vision for sustained expansion in new activities that create jobs and link with the broader economy. The growth in gold exports is more an accounting phenomenon than an economic or industrial activity. In addition, job elasticities are as limited as the mining activity itself. According to materials published by African Gold Refinery, publishes the company employs only 85 Ugandan staff, which stands in stark contrast with its commanding role in Africa gold trade and processing. More broadly, gold traditionally has presented fewer downstream processing and value-addition opportunities to be captured local by African countries. Unlike other metals and minerals, processed gold fits into three general categories: jewellery, gold bars as a store of value, and as inputs in small amounts in electronics and other devices. If value addition in connection with gold were to be the driver of a wider-reaching industrialization and economic transformation, it would need also to harness upstream and sidestream linkages with other activities, given the limited downstream opportunities. However, new opportunities are emerging for the use of gold as an input to technologies that are driving the global green energy transition. In this sense, the African gold sector can serve as an input to continental green mineral value chains (see section VII, subsection B).

Another crucial point is that the gold mining activities that are incentivized by higher global prices, can destroy the local environment of the mining communities and contribute to global emissions. While national energy grids in many countries are increasingly based on renewable and green sources, mining is often done off-grid and frequently relies on generator power. In many contexts in Africa, diesel trucks are used to transport minerals to ports, with more efficient rail opportunities remaining limited. Amoako and others (2018) found that electricity and fuel use in transport accounted for 92.5 per cent of emissions in large-scale gold mining in Ghana, and that emissions reduction targets in major mining countries, such as Australia, have been ineffective, with mining emissions rising 22 per cent since 2005. Heavy trucking also degrades public roads, requiring more frequent revamping of infrastructure. Accordingly, expanded mining activities would need to harness green methods (such as the focus on water efficiency in Chile), and the renewable energy basis for mining zones would need to be developed. Gold mining, similar to other mining activities, is characterized by a high proportion of artisanal and small-scale production, with significant implications as detailed in the box below.

Artisanal and small-scale mining in the gold sector

Artisanal and small-scale mining includes a range of stakeholders, from informal individual miners to small-scale entities that are quasi-formal and engage in commercial operations (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF), 2023). Up to 20 per cent of global gold is supplied by artisanal and small-scale mining, and, according to a conservative estimate, more than 10 million people are involved in such mining in Africa (IGF, 2017; African Minerals Development Centre, 2017b). Informal miners are more likely to use mercury, which, while helpful in identifying gold deposits, is extremely damaging to the ground and water where it is used. Mercury is also extremely hazardous for the miners themselves, of which more than half are women, leading to such health effects as irreversible in-utero brain damage (IGF, 2017). The volatility in the gold market and the disruptions caused by the COVID-19 pandemic mean that artisanal and small-scale miners may not benefit as much from the gold boom as have large-scale miners, owing to lower capacity and lack of safeguards and access to infrastructure (Gajigo and Ahadjie, 2020). One example of best practice in extending such safeguards to artisanal and small-scale miners is provided by ENAMI, a State-owned enterprise in Chile that issues loans to acquire capital and technology and that guarantees a price-floor for products of artisanal and small-scale mining (ECA, 2017).

These trade trends, and the incentives they represent in certain sectors, have significant implications for the world's sustainable development outlook. Mining affects all 17 Sustainable Development Goals to some degree, and directly affects Goals 3, 5–10 and 12–15. Mining has similar implications for the goals of Agenda 2063, in particular goals 1, 3, 4, 6, 7 and 17. Countries pledged to limit global temperature rises to a maximum of 2 per cent higher than pre-industrialization levels – and ideally only 1.5 per cent higher – in signing the Paris Agreement in 2015. Meanwhile, mining is directly responsible for 4–7 per cent of greenhouse gas emissions, a percentage that is growing with increased mining activity brought on by rising price of gold and growing demand for the minerals needed for the green transition (Delevingne and others, 2020). It is worth noting that the emissions-reduction targets set by mining companies are far below those needed to reach the Paris Agreement goals.

The main lessons are that, despite the major driving force of gold behind many macroeconomic figures (including the perceived diversification (or concentration) of the continent's exports), gold mining is neither a job- and income-generating activity needed to drive structural transformation, nor a climate- and ecosystems-friendly activity in line with regional and global commitments to sustainable development. However, the factors of production that are used in the extractive sectors in general and in gold mining in particular hold immense potential if applied or directed towards new and growing activities in the production of the resources required for the green transition, and if linked with other transformative activities.

VII. How infrastructure for gold can be re-applied to other transformative resource activities

The literature on industrialization and economic transformation introduced earlier, from Prebisch (1950) to Hirschman (1981) to Chang (2002), concludes that shifting away from dependence on low-value primary commodities requires concerted effort to build new competitive advantages, rather than relying on existing comparative advantages, which may lock them in at lower rungs of economic participation and development. The changes in the dynamics of export concentration and diversification following the shock of the pandemic have put a spotlight on commodity dependence, in particular in connection with gold but also in relation to fossil fuels. However, the critical mass of infrastructure and investment surrounding existing extractive activities in these sectors can be harnessed as a catalyst for other activities that can generate higher incomes and develop a more inclusive and greener economy. Following such a path will require a host of interventions, guided by an organized framework involving the State, the private sector, citizens and all stakeholders.

A. Diversification based on assets and competitive advantages

It is possible to build higher value and transformative industries based on primary resources, and many examples of this exist in the African context. ECA examined a host of opportunities in commodity-based development and building linkages across activities (see table 5). Surveys of businesses involved in each value chain were used to identify the main barriers to value addition and the most critically needed interventions. Skills, capabilities and quality of domestic suppliers were consistently raised as key issues across sectors (ECA, 2013). Addressing those issues requires a comprehensive and implementable system of support and programmes for local entrepreneurs and small and medium-sized enterprises.

Gold mining in Ghana, where there is much local potential in skills and in firms, is a particularly illustrative example. Regarding upstream suppliers, local sourcing for the three largest foreign gold mining firms stood at between 67 and 79 per cent of total spending in 2011, relying on more than 1,000 local supply firms. As with the general findings, quality, innovation and trust were the three most important criteria for gold mining stakeholders in choosing suppliers and were the

main issues limiting greater procurement from local firms. Meanwhile, infrastructure was deemed the greatest hindrance to downstream linkages in refining and processing. The findings from that survey (ECA, 2013) were comparable to market trends today, since the analysis was undertaken at a time of rising gold prices, due to both a commodity supercycle and duncertainty that followed the global financial crisis of 2008 and the taper tantrum of 2013, both of which led to greater demand for safe assets and stores of value.

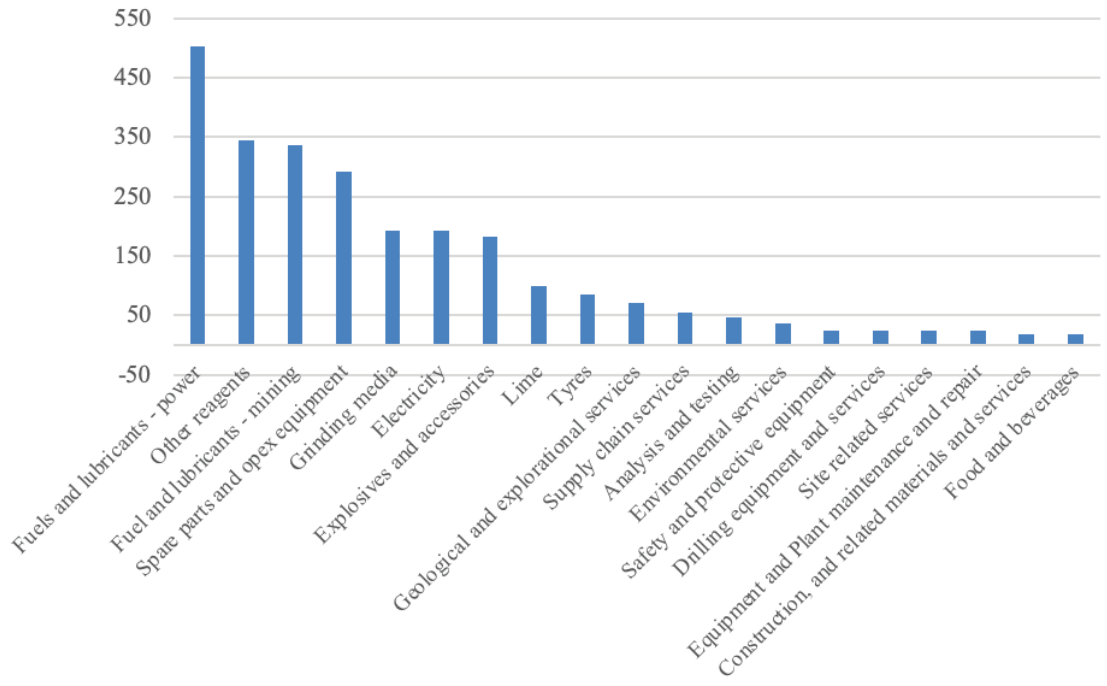
Table 5: Opportunities for linkages and value addition in Africa, by commodity

Commodity	Downstream linkages	Upstream linkages
Agriculture: cocoa, coffee, tea, agro-products		
Industrial commodities: cotton, textiles and clothing, leather, oil, copper, gold and mining supplies	Semi-processing, processing, marketing	Supply products for farmers, miners and factories

Source: ECA (2013).

In 2018, the African Minerals Development Centre carried out a deep assessment of the linkage opportunities from gold mining in Ghana and elsewhere in West Africa through value and supply chains in that subregion. The Centre undertook a market assessment of manufactured mining inputs that have the potential to be produced locally and to be used in the subregional market both in gold mining and in other sectors beyond mining. The findings revealed 19 products, the local production and procurement of which would generate a cumulative $2.66 billion in demand in four West African countries (Burkina Faso, Côte d'Ivoire, Ghana and Mali) (see figure 5).

Figure V: Total procurement across four West African countries, by product (Millions of United States dollars)



Source: African Minerals Development Centre (2018).

There are clear examples of how the growing role of the gold industry could be used to spur true industrialization and diversification. A main intervention to facilitate this, as noted in the studies consulted, is through engaging with and supporting local firms. Regarding the skills and capacity development of local firms, the African Minerals Development Centre (2018) recommends that such efforts be overseen by a supplier development programme. The World Trade Organization (2021) recognizes that diversifying is a costly exercise for individual firms – finding new suppliers, reaching new economies of scale and so forth require significant investment – and thus, collective action and guidance from the State is crucial. It also notes that clear, transparent and predictable business regulations and policies can incentivize investment in new and diversified activities. Such efforts will get a boost from the implementation of the African Continental Free Trade Area. The upstream gold inputs identified here harness procurement across four countries because of the relatively limited size of each individual market. In addition, the African Continental Free Trade Area is envisioned to reduce official and unofficial barriers to doing business across borders, building on the integration witnessed within the regional economic communities of Africa. Regional arrangements that boost local firms are at the centre of the African Continental Free Trade Area's role in industrialization.

The local mining firms and suppliers surveyed during the writing of *Economic Report on Africa 2013*, and those with potential to provide the products listed in the African Minerals Development Centre report of 2018, are not necessarily locally owned firms, but rather firms located in the region, regardless of ownership structure. This speaks to a major issue with local content policies in the sector. Local content is an important tool to encourage firms in the mining sector to increase the share of local procurement and employment. Such policies are crucial to ensuring that lucrative extractive activities provide commensurate local employment and procurement. In practice, however, many such policies merely serve as box-checking exercises, allowing for local sourcing of low-value products but the importing of high-value inputs, with ownership and high-level business and engineering posts being held by foreign interests.

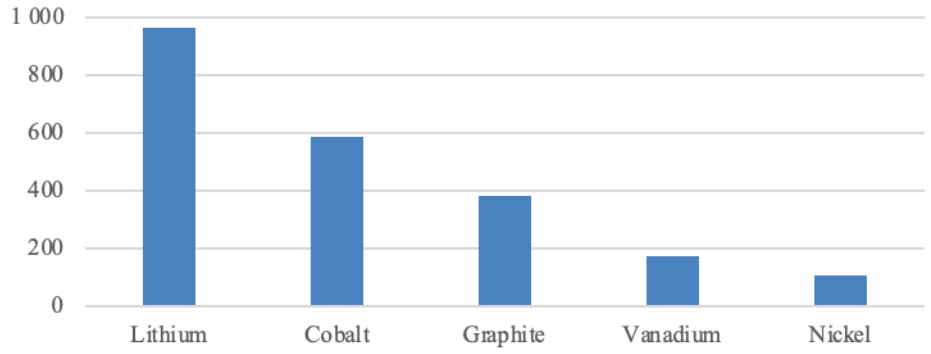
The Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (2018), outlines key ways to make sure that local content policies work for mining communities, including by ensuring that the policies match national development objectives, are based on realistic assessments of the potential for local industry, and reflect national aims for local procurement, direct employment, and linkages with other sectors. Such a local content system must be underpinned by strong monitoring, review and enforcement. These tools will help African countries to ensure that gold and other mining activities contribute to real linkages and economic diversification.

B. Green minerals boom

Other opportunities to link the growing gold sector with broader economic activities are present in the ongoing global green minerals boom. As countries transition to renewable sources of energy and transportation facilitated by electric vehicles, they will require new materials for turbines, solar panels and other devices, along with extensive energy storage capacity using batteries that rely heavily on a specific set of minerals. An immense increase in production would be needed to meet the growing demand (see figure VI). While African countries expand the mining and export sectors, the countries are also in a unique position to mandate greater local value addition and deeper linkages with these activities. This strengthened bargaining position will emerge for

a number of reasons. Given that Africa accounts for an immense global share of some minerals (such as more than 70 per cent of cobalt and above 60 per cent of manganese), it has the market power to require expanded local procurement and partnerships with multinational firms. African countries are also emerging as new and alternative partners as the global community seeks to diversify supply chains and reduce geopolitical risk associated with the concentration of production.

Figure VI: Increase in mineral production needed for the green transition (Percentage)



Source: Kitaw and Sloan (2023).

In taking advantage of this bargaining power, countries can pursue new and more equitable joint ventures with global leaders in services and manufacturing, to ensure greater skills- and technology-transfer, and the setting up of an in-country production centre. In connection with the discussion on diversification, on the basis of existing endowments, countries can also position their traditional mining assets to plug into the green transition. The technology, capital, energy and other inputs needed for the gold operations of such companies as African Gold Refinery can be put to good use in producing the minerals needed for the green economy, becoming a regional processing centre for the inputs required for lithium ion batteries and electric vehicles. Initiatives such as the joint push to manufacture these batteries in the Democratic Republic of the Congo and Zambia have enjoyed significant political will and movement thus far, and intend to capitalize on the green minerals boom and the extensive assets that exist in the region.

ECA, Afreximbank and other key partners are supporting the development of a regional battery mineral supply chain, centred on the Democratic Republic of the Congo and Zambia and with linkages to expand throughout the region. Initial steps, including a communal centre of excellence for battery technologies and a cross-border battery mineral special economic zone, will help to translate this boom into greater local value addition and job creation. The region also has ambitions to not stop at batteries, but continue towards local production of electric two, three and four-wheeled vehicles. This can harness existing automobile manufacturing activities across the continent.

C. Greening current and future activities

Another important step is to make sure that current and planned mining – for gold, green minerals and other products – is made greener and more environmentally friendly.

Delevingne and others (2020) noted that mines can decarbonize through greater efficiency, electrification, and harnessing renewable energy. Carbon-capture, on-site recycling and other initiatives present win-wins for mining and the environment. Such initiatives, while often capital-intensive at the outset, can reduce costs in the long run by eliminating waste and linking with national utility grids. The decarbonization of mining is not only integral to the global fight against climate change, but presents clear economic opportunities as well. New climate financing mechanisms – such as green and blue bonds, climate-for-debt swaps, and the Liquidity and Sustainability Facility – present sources of funding for green initiatives. A focus on green mining and manufacturing can also draw more investment and interest from the region. According to BloombergNEF (2021), building a cathode precursor facility in the Democratic Republic of the Congo would be greener and lower in cost than doing so in China, Poland or the United States of America.

Platforms and frameworks also exist to address the community-level environmental degradation and human rights issues stemming from mining. In artisanal and small-scale mining, proactive engagement with miners to extend the benefits afforded to formal firms and miners is an important first step. Full implementation of the Minamata Convention on Mercury is necessary to begin tackling the many environmental and health effects of mining.

The region's move to more value-added activities along mineral-based value chains and diversification into other manufacturing activities can also be made more sustainable. ECA (2016) noted four entry points for inducing greener industrialization: changing price incentives, regulating environmental standards, greening public infrastructure, and carbon decoupling. An alternative path based on these interventions would also lead to higher GDP per capita, more exports, lower poverty and other improved outcomes, compared with a business-as-usual scenario. There are numerous examples of production processes having been made greener, ranging from firm-level examples such as the pursuit by Leather Industries of Uganda of a comprehensive, resource-efficient and clean production approach, to collective cases such as Hawassa Eco-Industrial Park in Ethiopia, and national energy initiatives including biofuel in Malawi, solar power production in Morocco and geothermal power production in Kenya.

VIII. Conclusion

Trends in commodity-dependence in African economies have been examined in the present policy paper, using the effects of the COVID-19 pandemic on export concentration as an indicator to reveal specific drivers of that dependence and their implications for the continent's agenda for sustainable development and transformation. Initial findings on export concentration between 2018 and 2020 give the initial impression that the region and many countries were able to reduce dependence on a few key commodities in the export basket, from an index of 0.285 to 0.195. Yet the intervening causes of this – the collapse in global markets for fossil fuels alongside spiking gold prices – have further underscored the outsized role of commodities in African economies.

The present policy paper highlights changes in the export share of gold and in broader commodity drivers of export concentration during the pandemic. It draws on studies and examples of green growth and industrialization to contribute to the literature on policy actions that can directly address these issues. Commodities present a plethora of opportunities for value addition, from

downstream beneficiation, to upstream value-added inputs to mining, to sidestream linkages with other sectors. Examples of these opportunities, especially in the gold sector, take on renewed significance in the ongoing green transition, in which the capacity to extract, add value to and export all minerals (especially green minerals) are central topics on the global sustainable development agenda. There is potential for African countries to link their extractive sectors with other green economy activities, both through products for the green transition and through the greening of production processes. Africa has a renewed opportunity to harness its minerals as a tool for greater and more inclusive development, driven by the centrality of the continent to the green transition, and to use these resources as a key bargaining tool to generate greater value added and more high-wage jobs. Overall, many opportunities can be seized upon to incentivize local production, bring in foreign investors and partners in a more constructive role, and lay the groundwork for a more diversified and greener growth model in Africa.

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