



*Routledge Studies of the Extractive Industries and Sustainable
Development*

AFRICA'S MINERAL FORTUNE

**THE SCIENCE AND POLITICS OF MINING AND
SUSTAINABLE DEVELOPMENT**

Edited by

Saleem H. Ali, Kathryn Sturman, and Nina Collins



Africa's Mineral Fortune

For too long Africa's mineral fortune has been lamented as a resource curse that has led to conflict rather than development for much of the continent. Yet times are changing and the opportunities to bring technical expertise on modern mining alongside appropriate governance mechanisms for social development are becoming more accessible in Africa.

This book synthesizes perspectives from multiple disciplines to address Africa's development goals in relation to its mineral resources. The authors cover ways of addressing a range of policy challenges, environmental concerns, and public health impacts and also consider the role of globalization within the extractive industries. Academic research is coupled with key field vignettes from practitioners exemplifying case studies throughout. The book summarizes the challenges of natural resource governance, suggesting ways in which mining can be more effectively managed in Africa. By providing an analytical framework it highlights the essential intersection between natural and social sciences, central to efficient and effective harnessing of the potential for minerals and mining to be a contributor to positive development in Africa.

It will be of interest to policy makers, industry professionals, and researchers in the extractive industries, as well as to the broader development community.

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Introduction

Saleem H. Ali and Kathryn Sturman

For many centuries Africa's rich mineral endowment has shaped the fortunes of its peoples and the environment. Beginning in the early twenty-first century, the commodities price boom and concerns about human impacts on the environment have seen increasing value placed on the continent's renewable and non-renewable natural resources. Operators explored and extracted mineral and energy resources at an unprecedented pace during the boom, with regulators scrambling to keep up. The limitations of the so-called commodities super cycle soon became apparent to Africa's policymakers and investors alike, however, prompting a need for revised approaches to resource governance in the past five years.¹ At the same time, competing land and water uses, deforestation, and loss of biodiversity remain key concerns for climate change mitigation and environmental conservation. This raises an enduring question: How does Africa develop its mineral fortune sustainably, both in environmental and in socio-economic terms? The concentration of low-income, resource-dependent countries in Africa places it at the center of global debates about sustainable development and the extractive industries.

In the spirit of the Routledge Extractive Industries and Sustainable Development series, this book aims to synthesize perspectives from multiple disciplines to address Africa's sustainable development challenges. Mineral development is a highly technical arena where geologists, mining engineers, and environmental scientists have traditionally held ascendancy. However, the social impact of minerals and the long history of their linkage to colonialism have posed serious development questions that extractive industries and governments need to address. Mineral development is not merely a matter for engineers and scientists to negotiate, but also the start of a complex supply chain of materials that have immediacy for human and environmental impacts in Africa and worldwide.

Several chapters in this book were informed by work under the auspices of the Sustainable Minerals Institute of the University of Queensland and the University of Western Australia, with financial support from the Australian Aid Initiative on International Mining for Development that ran for three years (2012–2015). The Sustainable Minerals Institute's holistic approach to environmental and social sustainability is reflected in the book's unique conceptualization of this topic. We have also invited authors from other leading research centers in science and policy

to contribute, however, to give full topical coverage to key issues around African mineral development. Wherever possible we have teamed African researchers with non-African researchers in chapter authorship to ensure lessons and insights that transcend geographic biases. We also invited environmental organizations such as Conservation International as well as international policy think tanks such as Chatham House to ensure timely relevance of the material with key stakeholders outside academia. We convened a workshop with the authors in December 2016 to ensure connectivity between chapters and to provide authors and editors with more-robust communication that would better integrate the themes of the volume.

The book is divided into four parts, the delineation of which were determined through interactions at the authors' workshop. To sharpen the focus of key themes we also decided to include field vignettes within each part, with short exemplifying cases written by practitioners. Part I starts by considering the political template on which mineral extraction occurs in Africa with chapters on resource governance and the impact of globalization on development paths within the continent. Part II considers key areas of data deficits that can impact mineral development paths within Africa and how these can be addressed through a range of natural science and social science methods. Part III focuses on the key environmental challenges that are linked to mining in Africa, and some novel ways of addressing these challenges. In addition, the Ebola crisis in West Africa in 2015 prompted us to include a chapter on public health and mining. Finally, in Part IV we come full circle with the challenge of resource governance and present key ways in which scales of mining development can be more effectively managed in the African context of multiple jurisdictions and uneven regulatory capacity between and within states. We are conscious of the tension between aspirations for African unity as an antidote to a fracturing colonial legacy on the one hand, and the desire of African states to distinguish themselves culturally and eschew a simplistic homogenization on the other. In the context of mineral development, however, there has been a concerted effort by the African Union to recognize cross-cutting lessons across Africa, hence the continental cadence of this volume is appropriate. This volume presents an eclectic set of methods to show how environmental science and resource governance require a diverse skill set and consequent capacity building within Africa.

Our goal is to provide an accessible and high-quality anthology that can assist African policymakers and link Africa's challenges to global sustainability conversations. Minerals are an essential part of our lives because of their use in technologies we use daily. The supply chains of so many of these essential elements can be traced back to Africa; this gives the countries of the continent some leverage but also makes them vulnerable to what has been termed "the resource curse." The lessons gleaned from this volume on how to harness Africa's mineral wealth for development will undoubtedly have implications for material use and flows worldwide.

This book has two key conceptual frames that have assisted us in selecting and developing chapters. First, we consider the life cycle of mineral extraction as conducted by mineral developers and regulated by governments. Figure 0.1 lays out the chain of value that goes through the four key phases of an extractive operation. The two contravening arrows at the bottom indicate that the value chain has to constantly contend with costs and benefits that require various forms of scientific data, risk analysis, and policy considerations to balance.

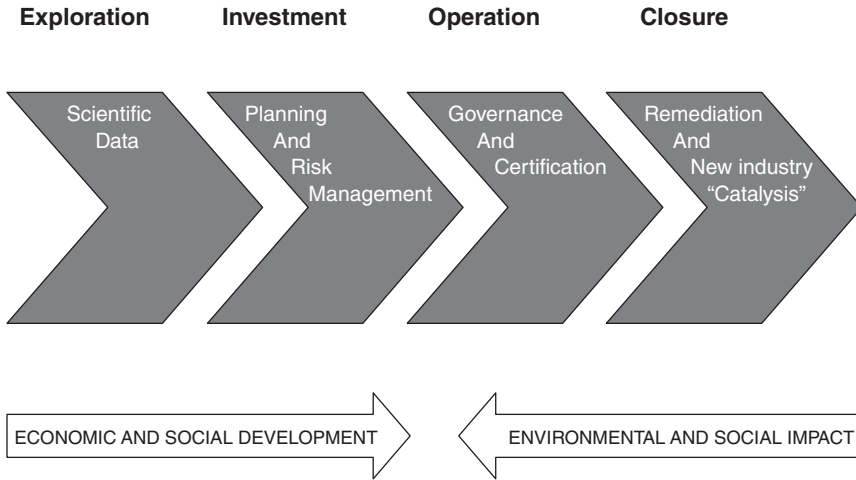


Figure 0.1 Life cycle of mineral extraction

We are preparing this book for publication at a time when there is considerable anxiety regarding the developmental benefits of mining. The resource boom from 2000 to 2012 that was spurred by the rapid infrastructure developments in China has abated, and resource economies are waiting for the next demand cycle to spur economic activity. China's investment in Africa has led to a growing literature of dissent regarding the scale and scope of the enterprise and its overall costs and benefits for the continent.² Furthermore, investment in exploration is currently being hampered by lack of capital and a dire legacy of errant closure of past projects with serious environmental legacies that governments and industry are now trying to remediate.³ At the same time, the extractive enterprise can be sustainable only in its contributions toward development if the capital harnessed from the extractive enterprise can catalyze other sectors of development. Minerals as a primary sector might be deemed non-renewable on human time scales, but the minerals sector certainly has the potential to stimulate other sectors of the economy that might otherwise remain dormant. The economic linkages accorded by the extractive sector need to be considered at every phase of the life cycle. Governments need to consider more carefully the investment of the broader wealth to catalyze other industries beyond the life of the mineral extraction phase.

With this backdrop, we have also considered a second conceptual frame for the book, one that advances the discussion of mineral contributions to Africa's development across the realms of the natural sciences and public policy. This is a novel approach that aims to bridge an apparent divide in studies of mineral development. Much of the literature on extractive industries is either highly technical earth sciences and engineering research on the one hand, or political economy and anthropological analyses of minerals and development (or lack thereof) on the other.⁴ There is also a stark disconnect between the environmental conservation discourse on Africa and the vast economic development literature.

Where integrative anthologies have been attempted, they have focused on very broad questions of sustainability rather than on focusing on analyses by a range of disciplinary practitioners.⁵ We have provided an analytical frame that allows for the science and public policy interface to be more closely aligned and analyzed through the chapter selections for this book.

Figure 0.2 shows the basic data premises on which the science and policy interface must be predicated at the center of the diagram. In this figure we have linked key aspects of the mineral development challenge represented by the book's chapters. It is important to note that we are ultimately concerned about moving away from a linear view of extractive industries and are particularly inclined to highlight industrial ecological approaches to connecting science and policy in mineral extraction. We have circled for emphasis the aspect of the diagram that ties in with the nascent concept of a circular economy.

Existing literature on Africa's extractive industries does not adequately address the cyclical nature of this most volatile of markets.⁶ Academic and applied policy analysis alike tells the story of opportunities and threats facing African countries from heightened demand for minerals, but pays little attention to what could happen when demand drops. Two discourses stand out: (1) the optimistic "Lions on the Move" thesis from the McKinsey Global Institute and (2) the pessimistic "scramble for Africa."⁷ Neither addresses the inevitable situation facing many resource-dependent countries when price fluctuations force operators to put megaprojects on ice at short notice, and transnational corporations divest assets as quickly as they acquired them. How might geology and technology intersect with these economic challenges to allow for more-sustainable opportunities to emerge? Timing, flexibility, and long-term planning are key themes explored in this book, considered at each stage of extractives development.

The cyclical nature of the extractive industries has been shown to have a significant impact on political dynamics in resource-rich countries. For example,

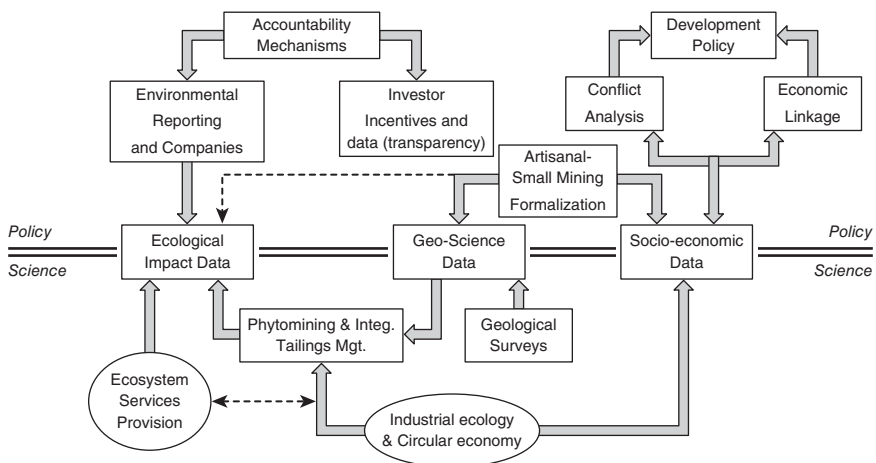


Figure 0.2 Themes linking science and public policy

Anthony Bebbington notes that political elites in resource-rich countries are more vulnerable to commodity price fluctuations than to any other exogenous factor related to extractive industries.⁸ Political scientist Miriam Lowi states that in Algeria, “When oil rents become important in an environment in which cleavages are deep and the ‘national question’ is contested, political stability is sacrificed in periods of resource contraction and distribution crises.”⁹ The cyclical nature of mineral and energy commodity prices undermines the stability of resource-dependent political settlements. This is especially the case for neo-patrimonial systems that use resource rents to co-opt political support. A sharp decline in mineral, oil, or gas prices strips this type of power away.

For example, Zambia’s exposure to the external shock of declining copper prices and rising oil prices in the 1970s has been a well-documented case of the curse of single commodity dependence. The prolonged economic recession eventually led to significant public protests and social mobilization led by the trade union movement. The most frustrating aspect of copper price dependence for the Zambian government has been the disruption of long-term development plans.¹⁰ We have further augmented such socioeconomic case research on Zambia with in-depth analysis of science-based approaches to addressing the country’s mineral quandaries through novel approaches to mine waste management, remediation of sites, health and safety concerns and managing social risk.

A boom in commodity prices increases non-tax revenue to resource-rich countries, which can have a stabilizing effect on ruling coalitions. Whether this stability is achieved by channeling windfall revenues into inclusive social spending, or into more-exclusive patron–client payments, depends on the nature of the political settlement. A stable political settlement is a basic condition for success of countries that have attained development from the mineral and energy resources. Developmental states might be able to achieve this level of stability without political inclusivity. Political and economic marginalization of actors living within resource-rich regions has been seen to fuel conflict in many countries, however. This risk is most acute at the early stages of exploration, licensing, and construction of new projects when they can be derailed by localized conflict, and before revenues have been shared with these subnational actors. Realistic and incremental efforts to achieve broad-based development from resource extraction are needed to balance inclusivity with stability.

The literature on the politics of mining also tends to focus on the interaction between political elites and large, state-owned, and multinational enterprises. There is a gap in considering artisanal and small-scale mining (ASM) from this perspective. This manuscript attempts to address this challenge through chapters that consider the impacts of a broad range of mining development efforts in Africa. Even where official government policy might be to encourage small-scale mining, the political dynamics within a country or region can undermine trust in licensing and regulation procedures. Accentuating these factors are the array of natural variables of ecosystem fragility, disease vector prevalence, and climatic variation across the several environmental zones in Africa. We have situated this anthology within this very broad context of natural resource governance research wherein Africa is the archetype for dealing with the most complex array of ecological and social challenges. We are conscious of the need for clear solutions rather than the recurring lament that often characterizes discourse on African development.

As the “African dream” is reimagined with the advent of the United Nations’ seventeen Sustainable Development Goals and their ambitious 2030 achievement timeline, we hope that this book will be of use to the broader development community.¹¹ Mineral extraction is an evocative topic wherein the narratives become polarized between renewability and non-renewability.¹² As green technology researchers frequently remind us, however, even clean energy sources such as wind and solar require minerals for infrastructure development.¹³ A sound understanding of the natural and social science that underpins mineral extraction is imperative. The costs and benefits of various techniques of extraction, the opportunities and limits of recycling, and the role of technological change in this milieu needs integrative analysis. Our aim in this volume is to highlight the essential intersection of science and politics in efficiently and effectively harnessing the potential for minerals as a contributor to development in Africa.

Notes

- 1 Commodity super cycles are periods of about forty years when commodity prices steadily climb for a decade or two, then fall slowly back to where they were.
- 2 Howard W. French, *China’s Second Continent: How a Million Migrants Are Building a New Empire in Africa* (New York: Vintage, 2014); David H. Shinn and Joshua Eisenman, *China and Africa: A Century of Engagement* (Philadelphia: University of Pennsylvania Press, 2012).
- 3 Ravi Jain, *Environmental Impact of Mining and Mineral Processing: Management, Monitoring, and Auditing Strategies* (London: Butterworth-Heinemann, 2015).
- 4 Pádraig Carmody, *The New Scramble for Africa* (Cambridge, UK; Malden, MA: Polity, 2011); Bonnie Campbell (ed.), *Modes of Governance and Revenue Flows in African Mining* (Basingstoke: Palgrave Macmillan, 2013).
- 5 J. Richards (ed.), *Mining, Society, and a Sustainable World* (Heidelberg; New York: Springer, 2009).
- 6 See, for example, D. Bryceson et al. (eds.), *Mining and Social Transformation in Africa* (London: Routledge, 2014); J. A. Grant et al. (eds.), *New Approaches to the Governance of Natural Resources: Insights from Africa* (Basingstoke: Palgrave MacMillan, 2014). Bonnie Campbell, (ed.), *Modes of Governance and Revenue Flows of African Mining*.
- 7 McKinsey Global Institute, “Lions on the Move: The Progress and Potential of African Economies” (McKinsey & Company, 2010), www.mckinsey.com/global-themes/middle-east-and-africa/lions-on-the-move. Pádraig Carmody, “Cruciform Sovereignty, Matrix Governance and the Scramble for Africa’s Oil: Insights from Chad and Sudan,” *Political Geography* 28:6 (2009): 353–361.
- 8 A. Bebbington, “Governing Natural Resources for Inclusive Development” in S. Hickey, K. Sen, and B. Bukenya (eds.), *The Politics of Inclusive Development: Interrogating the Evidence* (New York; Oxford: Oxford University Press, 2015).
- 9 M. R. Lowi, “Oil rents and Political Breakdown in Patrimonial States: Algeria in Comparative Perspective,” *Journal of North African Studies* 9:3 (2004): 85.
- 10 M. Hinfelaar and J. Achberger, “The Politics of Natural Resource Extraction in Zambia” (Lusaka, Zambia: Southern African Institute for Policy and Research, 2016).
- 11 For a discussion of the relationship of extractives to the Sustainable Development Goals refer to: World Economic Forum, *Mapping Mining to the Sustainable Development Goals: A Preliminary Atlas* (Geneva: World Economic Forum, 2016), http://unsdsn.org/wp-content/uploads/2016/01/160115-Atlas_full.pdf.
- 12 For a broad review of minerals and sustainability discourse from a historical and contemporary perspective refer to Saleem H. Ali, *Treasures of the Earth: Need, Greed and a Sustainable Future* (New Haven; London: Yale University Press, 2009).
- 13 David Abraham, *Elements of Power* (New Haven; London: Yale University Press, 2016).

Part I

The politics of African mining



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1 Harmonizing African resource politics?

Lessons from the African Minerals Development Centre

Rodger Barnes, Kojo Busia, and Marit Kitaw

In brief

- The Africa Mining Vision offers a framework for resource exploitation that achieves sustainable development in countries with diverse mineral prospectivity, development histories, and institutional and human capital.
- The vision's origins and principles for broad-based socioeconomic development across the continent are being implemented by the African Minerals Development Centre.
- The Africa Mining Vision is significant both as a framework for guiding countries that are seeking to maximize the contribution of mining to sustainable development and in educating practitioners and scholars who are working on inclusive social and economic development opportunities from mining in Africa.

Domesticating the Africa Mining Vision (AMV) at the country level through Country Mining Vision (CMV) entails deliberate interventions more than an “invisible hand.” It requires strong national ownership of the process, which, although government-led, must be inclusive enough to promote broad consensus on how to ensure that mining policies outlast political and electoral cycles. A multi-stakeholder approach that considers the perspectives of civil society and community-based organizations, local administrations, and the private sector is fundamental, as shown in the examples of Lesotho and Mozambique. A trusted broker with technical and financial capacity is needed at the country level to effectively facilitate the beginning of the process, through a mechanism that can consequently be organically adopted by the country.

Implementing the AMV at the country level ultimately requires a profound understanding of the institutional and agency dynamics in the country; the incentives to adapt to change and a continuous mechanism to mobilize the multiple stakeholders to collaborate across sectorial and jurisdictional divides. It relies on high-level government leadership to sensitize actors to change and articulate clear

and effective pathways for transformation. The buy-in of key actors and agencies is needed so that ministries responsible for mineral development along with national development authorities become owners and strong implementing agents of the AMV and domesticated CMVs.

Introduction

In February 2009, the African Union Assembly of Heads of State and Government (AU) adopted the Africa Mining Vision (AMV). For the first time, African nations devised a strategy for harnessing the extractive resources sector that would spur economic development and structural transformation across the continent. Based on foundational ideals of equity and fairness, the AMV delivered a comprehensive blueprint for governments, private enterprises, and non-government agencies alike to pursue the optimal exploitation of resources.

In adopting the AMV, the AU called on the international community and Africa's development partners to support the efforts of member states "towards enhancing the contributions of mineral resources to the achievement of the MDGs (Millennium Development Goals), the eradication of poverty and the promotion of sustainable economic growth and development."¹ Through the AMV, the AU set a bold and ambitious agenda to endow the extractive resources sector with a prominent role in socioeconomic development.

This chapter examines the implementation of the AMV as a roadmap for change, both in the governance of extractive resources and in the linkage of the mining industry with other parts of the economy. The chapter first reviews the AMV's historical and political origins along with its main principles and objectives. Next, the chapter describes the AMV's implementation by the institution entrusted with the task, the African Minerals Development Centre (AMDC).

The inception of the AMV coincided with China's spectacular growth and sustained demand for mineral resources. Lower commodity prices and the ensuing fiscal crises are currently challenging many resource-dependent African countries. Questions have arisen over whether the AMV's development objectives can be maintained in a depressed commodity cycle. Busia and Akong contend that the AMV is forward-looking and robust enough "to bring about a lasting paradigm shift for Africa's extractive sector, anchored on its broad-based development."² This chapter examines the approaches, successes, and challenges of implementing the AMV as the primary framework for practitioners and scholars in ensuring that extractive resources contribute to sustainable economic and social development in Africa.

Box 1.1 Text of the Africa Mining Vision

"Transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socioeconomic development."

This shared vision will comprise

- A knowledge-driven African mining sector that catalyzes and contributes to the broad-based growth and development of, and is fully integrated into, a single African market through

- Downstream linkages into mineral beneficiation and manufacturing;
 - Upstream linkages into mining capital goods, consumables, and services industries;
 - Sidestream linkages into infrastructure (power, logistics, communications, water) and skills and technology development (HRD and R&D);
 - Mutually beneficial partnerships between the state, the private sector, civil society, local communities, and other stakeholders; and
 - A comprehensive knowledge of its mineral endowment;
- A sustainable and well-governed mining sector that effectively garners and deploys resource rents and is safe, healthy, gender and ethnically inclusive, environmentally friendly, socially responsible, and appreciated by surrounding communities;
 - A mining sector that has become a key component of a diversified, vibrant and globally competitive industrializing African economy;
 - A mining sector that has helped establish a competitive African infrastructure platform, through the maximization of its propulsive local and regional economic linkages;
 - A mining sector that optimizes and husband Africa's finite mineral resource endowments and that is diversified, incorporating both high-value metals and lower-value industrial minerals at both commercial and small-scale levels;
 - A mining sector that harnesses the potential of artisanal and small-scale mining to stimulate local/national entrepreneurship, improve livelihoods, and advance integrated rural social and economic development; and
 - A mining sector that is a major player in vibrant and competitive national, continental, and international capital and commodity markets.

Harnessing Africa's resource endowment

The narrative of Africa rising has dominated the first decade of the twenty-first century, with the continent's GDP rising on average nearly 5 percent a year.³ This growth, however, has not led to improvements in broad-based measures such as the Human Development Index (HDI) or in reduced rates of poverty. Instead, Africa's share in world trade has remained very low, with its exports concentrated in natural resources and minerals. At the same time, African economies have not changed in ways that would sustain social and economic development. World economic trends such as volatile commodity prices have underscored the perils of strong economic growth without concurrent industrial development and structural transformation.⁴

Yet even though demand for mineral commodities is falling in this post-boom commodity cycle, the diverse range of commodities and extent of development needs across Africa present extraordinary opportunities for wealth creation. As the world's second largest continent, Africa is home to an estimated 30 percent of global mineral reserves, with several countries hosting world-class mineral deposits.⁵ Thirty-four of Africa's fifty-four countries have economies that are mineral dependent, with minerals composing at least one-quarter of their exports.⁶ Africa ranks

among the world's largest suppliers of certain minerals, with three-quarters of the global platinum supply, half of the world's diamonds and chromium, and up to one-fifth of gold and uranium.⁷ Furthermore, it has globally important reserves of bauxite, iron ore, cobalt, tantalum, copper, and tin. As of 2013 Africa received about 14 percent of mining investments worldwide, with \$110 billion invested in 26 projects around the continent.⁸ In 2012, 17 percent of the world's planned worldwide exploration budgets, or \$3.4 billion, was earmarked for Africa.⁹

The continent is also becoming an important petroleum exporter. Countries in sub-Saharan Africa have 5 percent of global production and 5 percent of the world's oil reserves. Nigeria and Angola are among the top 20 oil producers in the world, and between 2001 and 2010 the two countries' oil reserves increased by 20 percent and 100 percent, respectively. Other significant oil reserves have been discovered in Ghana, Uganda, the Democratic Republic of the Congo, and Kenya. The U.S. Geological Survey estimates that Kenya, Mozambique, and Tanzania hold greater reserves of natural gas than the combined reserves of the United Arab Emirates and Venezuela. Mozambique's natural gas reserves are double those of Libya.¹⁰

The McKinsey Global Institute's outlook for growth in Africa thus remains promising, with the continent's production of oil, gas, and most minerals predicted to continue to grow steadily by between 2 and 4 percent per year. At this rate of growth, the value of resources production would rise from \$430 billion in 2016 to \$540 billion by 2020.¹¹

While the rich resource endowment of Africa is unquestioned, uncertainty remains over the extent to which African countries can leverage exploitation of their mineral and petroleum resources to transform their economies and societies.

The link between mineral endowment and economic growth has been the subject of debate for years. Many scholars argue that developing countries dependent mainly on resources for export earnings have experienced relatively slow rates of economic growth.¹² For several decades, economists have warned of the phenomenon known as the resource curse, in which imprudent expenditure of resource rents destabilizes the economy and renders much agricultural and manufacturing activity internationally uncompetitive.¹³ This occurred, for example, in Mexico, Nigeria, and Venezuela during the 1979–1980 oil boom. Some researchers also believe that mining has the propensity to increase local conflict and even spread violence regionally.¹⁴

One emerging paradox in Africa is that some of the countries that are richest in resources rank among the lowest on the HDI. For instance, oil-dependent countries such as Angola and Chad and mineral-dependent states such as the Democratic Republic of the Congo and Guinea have low HDI. Niger is the world's fourth-ranking producer of uranium and yet also trails the index.¹⁵ Yet there is no conclusive correlation between resource dependence and HDI: relatively high HDI levels are found in oil-exporting countries such as Algeria, Gabon, and Libya and mineral-rich South Africa and Botswana. Furthermore, whereas Africa in general has struggled to leverage resource development for the benefit of its people, some mineral-rich countries such as Botswana successfully use mining to induce economic growth and reduce poverty.¹⁶

The evidence suggests that the abundance of a country's resource endowment or reliance on mineral or petroleum exports is not a clear determinant of either

prosperity or impoverishment.¹⁷ While achieving development from minerals is clearly not automatic, neither is it the case that poor socioeconomic development is a necessary outcome of a country's resource endowment. The above analysis of differing development outcomes across various African countries suggests that the management of a country's resources is critically important.

The need for African-driven solutions

Prior to the AMV, no effective template existed for optimizing resource exploitation to achieve sustainable development. Resource economics drew on lessons from the economic transformation of northern European countries after North Sea oil was exploited in the late 1970s. Scholars warned of potential pitfalls such as Netherland's Dutch Disease, and cited examples of best practices such as Norway's use of oil revenue to lift it to the highest levels of development.

But these lessons did not translate neatly to the African context, with its vastly different history and political conditions. The impact of colonialism and the exploitative precedents it established affected the way countries developed their resources as they gained independence.

The global steel requires large volumes of coal and iron ore, and higher demand is an indicator of economic growth. Three global steel cycles since World War II also influenced mineral resource development. These cycles, outlined in the technical documentation supporting the AMV, are shown below:¹⁸

- Phase 1 (1950–1984): high intensity. Postwar reconstruction efforts and increasing buying power within the developed world produces strong mineral demand and high prices. Negligible impact in the developing world.
- Phase 2 (1984–2000): low intensity. Developed world infrastructure installed. Oversupply and low prices for most minerals.
- Phase 3 (2000–ca. 2011): high intensity (higher than phase 1). Developing world takes off and trade rules are revised, reflecting a partial loss of developed world hegemony over global trade systems. High demand and high prices.

Many African states were still colonies during phase 1, and on gaining independence there was a strong push for national sovereignty. Extractive resources came under state control in the 1960s and 1970s, leading to the nationalization of large private companies in Ghana, Guinea, Zambia, and other countries. The timing of this development was unfortunate, however, because it occurred just before the onset of phase 2, a period of weak demand and low prices. State control of the industry served to further weaken it through political interference in business decisions, disrespect for managerial and technical expertise, low reinvestment leading to capital consumption, and inability to access finance.¹⁹

By the late 1980s, generally at the instigation of the World Bank, many African countries instituted reforms to curb abuses and actively sought foreign direct investment. They also privatized state-owned enterprises and revised national mineral policies to emphasize security of tenure (security of the rights to the deposits the miners wish to mine) and to strengthen mineral rights. The new legal, regulatory, and administrative frameworks reflected a shift from government as an

owner-operator to government as regulator-administrator, with the private sector assuming the lead role in mineral development projects.²⁰ Governments offered comprehensive incentive packages to attract mining investors, particularly in the form of reduced taxes and royalties. In the late 1990s the industry witnessed less regulation, lower state share of resource rents, and limited linkages between the resources sector and the rest of the domestic economies.

These reforms accompanied a rise in mineral prices in phase 3, along with increased foreign direct investment and an influx of mining capital, technology, and skills. By the turn of the century, however, critics questioned whether the resources boom, and the ensuing rise in export earnings in many mineral economies in Africa, had a desirable impact on domestic resource development. They criticized the reforms as being narrow-minded and geared toward attracting foreign investment and promoting exports rather than fostering domestic development.²¹

This progression in Africa coincided with an increasing global focus on sustainable development. In 2002 the World Summit on Sustainable Development in Johannesburg shined a spotlight on mining, particularly on how the industry could contribute to global sustainable development. The mining industry came under tremendous pressure to improve its performance in several areas, such as environmental, social, and economic impacts; stakeholder participation, including local and indigenous communities and women; and technical capacity in host countries.

Following the World Summit on Sustainable Development the mining industry sponsored a major initiative to frame its response to the global focus on sustainable development. The Mining, Minerals and Sustainable Development project sought to recast the minerals sector as a major contributor to sustainable development. It acknowledged the dilemma of achieving sustainability from exploitation of non-renewable resources and argued that natural (mineral and petroleum) resource capital could be channeled into financial, human, and institutional capital to propel economic and social development. In its 2002 report, the Mining, Minerals and Sustainable Development project proposed a strategy for implementing sustainable development principles in the mining and minerals industry.²² The International Council on Mining and Metals followed suit the next year and adopted the Sustainable Development Framework to help members improve their sustainable development performance.²³

The extensive scrutiny of the global minerals industry revealed that a complex array of coordinated and interrelated conditions was necessary for resource development to produce desirable social and economic outcomes. Even experiences in developed parts of the world—such as central Australia, where indigenous communities hold significant statutory rights to control access to traditional lands and enter beneficial agreements—showed the need for proactive interventions to ensure that financial and other agreement benefits translated into human and institutional development.²⁴ Without effective linkages through local employment, training, and business development, there was little prospect of skills transfer, wealth creation, or community development.

Industrialization and resource development in Africa thus did not lead to diversified industrial economies. High levels of continental debt, poverty, capacity constraints, and lack of infrastructure only exacerbated the situation.²⁵

For Africa, creating better linkages between the extractive sector and other sectors of the local economy was essential to ensuring that long-term benefits accrued to host countries. Most of Africa's minerals were exported as ores, concentrates, and metals without significant value addition, so there was a great potential for mineral beneficiation. Beyond value addition and increased local processing, the regimes in resource-rich African states also needed to change to integrate the minerals sector within a diversified economy.²⁶

In formulating a long-term strategy to eradicate poverty and establish sustainable growth and development across the continent, it became clear that structural transformation of economies was a central component.

Formulating the Africa Mining Vision

The AMV emerged against the backdrop of externally imposed reforms, including those promoted by the Bretton Woods institutions, that were seen as lacking legitimacy and accountability. These reforms, based on unequal relationships between African countries and powerful multinational and financial institutions, privileged the interests of privately owned companies and elites over those of the majority of the population.²⁷ In formulating the AMV, policymakers recognized that little progress had been made to restructure the mining sector, which had operated as an enclave since colonial times. What was needed was a framework for integrating the sector more coherently into the continent's economy and society.²⁸

Busia and Akong describe the priorities of the AMV as "the product of long-standing aspirations of African governments to chart an alternative development path that is owned by countries."²⁹ Its evolution was stimulated by several initiatives for resource development that were implemented at the sub-regional, continental, and global levels.

Linking the extractive and other industries through economic clusters and infrastructure corridors formed the basis of initiatives such as the AU's New Partnerships for Africa's Development and the Big Table dialogue in February 2007 between African ministers of finance and economic planning and their counterparts in the Organisation for Economic Cooperation and Development.³⁰ Titled "Managing Africa's Natural Resources for Growth and Poverty Reduction," the Big Table was jointly organized by the United Nations Economic Commission for Africa (UNECA) and the African Development Bank.³¹ The Big Table noted that the reforms promoted by the Bretton Woods institutions in the 1990s had not led to development. Instead, it found that the resource industry continued to operate in economic enclaves and that poverty had not been reduced.³² The Big Table recommended that a study group be established to pursue the issue of mineral sector reforms.

In 2007, UNECA set up the International Study Group on Africa's Mineral Regimes (ISG), comprising experts on mineral development issues, including leading policymakers, researchers, academics, and practitioners, along with representatives of the AU, and regional economic communities; UN agencies; the Commonwealth Secretariat United Kingdom; and civil society organizations.³³ The ISG noted the potential for African mineral resources to anchor an

industrialization strategy that would secure sustainable growth and development. Toward this end, the ISG sought to move the focus of mineral policy beyond extracting resources and sharing revenue to encompass a more broadly based restructuring of African economies.

The work of the ISG informed the formulation of the AMV, which was endorsed by the first session of the AU Conference of Ministers Responsible for Mineral Resources Development held in Addis Ababa in October 2008. This conference was notable for the Addis Ababa Declaration on the Development and Management of Africa's Mineral Resources, which reaffirmed the group's "commitment to prudent, transparent and efficient development and management of Africa's mineral resources to meet the Millennium Development Goals (MDGs), eradicate poverty and achieve rapid and broad-based sustainable socio-economic development."³⁴

In adopting the AMV four months later, the AU Assembly requested that the AU conference of ministers develop a concrete action plan for implementing the AMV through the AU Commission and in partnership with UNECA, the African Development Bank, regional economic communities, and other stakeholders.³⁵

The AMV Action Plan was finalized during the second conference of AU mining ministers held in Addis Ababa in December 2011, with input from policymakers, the private sector, non-governmental organizations, artisanal and small-scale miners, academic institutions, and international development organizations.³⁶ As shown in Table 1.1, the AMV Action Plan features nine program clusters structured around the seven pillars of the AMV.³⁷

Table 1.1 Key pillars of the AMV and AMV Action Plan program clusters

<i>AMV pillars</i>	<i>AMV Action Plan program clusters</i>
Fostering a transparent and accountable mineral sector in which resource rents are optimized and utilized to promote broad economic and social development	Mining revenues and mineral rents management
Optimizing knowledge and benefits of finite mineral resources at all levels of mining and for all minerals	Geological and mining information system
Building human and institutional capacities toward a knowledge economy that supports innovation, research, and development	Human and institutional capacities; Research and development
Harnessing the potential of small-scale mining to improve livelihoods and integration into the rural and national economy	Artisanal and small-scale mining
Promoting good governance of the mineral sector in which communities and citizens participate in mineral assets and in which there is equity in the distribution of benefits	Mineral sector governance
Fostering sustainable development principles based on environmentally and socially responsible mining, which is safe and includes communities and all other stakeholders	Environmental and social issues

Developing a diversified and globally competitive African mineral industry that contributes to broad economic and social growth through the creation of economic linkages

Linkages and diversification;
Mobilization of mining and infrastructure investment

Source: AMV Action Plan, www.africaminingvision.org/amv_resources/AMV/AMV_Action_Plan_dec-2011.pdf

Implementing the Africa Mining Vision through the African Minerals Development Centre

The scale of change envisioned by the AMV was ambitious; to carry out its implementation, the second conference of AU mining ministers established the African Minerals Development Centre (AMDC) supported by development partners including Australia and Canada.³⁸ The AU formally launched the AMDC in December 2013 at the Mineral Resources Ministers' Conference in Maputo, Mozambique, with the AU Commission, UNECA, the African Development Bank, and the United Nations Development Programme (UNDP) as implementing partners.³⁹ The AMDC was commissioned to "work with member States and their national and regional organizations to enable mineral resources [to] play a greater transformative role in the development of the continent through increased economic, social linkages and improved governance."⁴⁰ The AMDC's business plan laid out a number of roles for the new center:⁴¹

- tracking and coordinating the implementation of the AMV and activities of the Action Plan;
- identifying gaps and areas of need in the member states and addressing them by tapping expertise and information resources from a broad range of local and international sources;
- undertaking and coordinating policy research to develop policy strategies and options for realizing the AMV;
- conducting an advocacy and information dissemination campaign including websites and discussion fora to engage various stakeholders and help create a movement for achieving the AMV;
- monitoring, evaluation, and review of initiatives undertaken to advance the AMV; and
- generally providing a think-tank capacity for embedding the AMV into Africa's long-term development.⁴²

Effecting change required the AMDC to work with countries that have distinct histories and development trajectories where mineral resources either play or potentially play a significant role in the economy. Africa is a diverse continent, and many countries face considerable political, social, and economic challenges, including poverty, disease, and civil strife. Implementation of the AMV also had to address additional challenges in a range of areas:

- Integrating mining operations into the domestic economy. Most mining operations were developed as enclaves with weak integration into the rest of the economy. In Africa many factors hampered the development of economic linkages in the mineral sector, including inadequate infrastructure; low levels of industrialization, which translates into weak markets for mineral products; procurement policies of mining companies that do not prioritize local content; and, in general, a poor knowledge base and inadequate technological capabilities.
- Establishing effective regulatory frameworks founded on sound legal systems that provide accountability and equity. Such frameworks entail public sector institutions that are transparent in their dealings with the private sector and civil society. Transparency includes fighting corruption using legal recourses as well as adherence to clearly articulated policies.
- Fairly structuring the revenue flows and distributing them locally and nationally, as well as reconciling conflicting interests and managing expectations. The process of transforming revenue flows into permanent wealth that outlasts finite resources requires good planning and making well-informed judgments on savings versus investment.
- Dealing with inadequate capacity and weak coordination of actions within the mineral institutional chain.⁴³ Without strong institutions it is difficult to generate resource-driven broad-based development.
- Addressing permanent adverse impacts of mining on the land and the environment. The effects on the environmental and social impacts of mining are strongly linked. Adverse impacts are worsened by poor governance, a weak regulatory environment, and insufficient enforcement capacity. One of the key challenges is the capacity to enforce impact management instruments, such as environmental and social impact assessments.
- Using participatory and consultative approaches in societies that normally follow a more hierarchical pattern. This challenge is worsened by asymmetry of power, knowledge, capacity, and resources between mining companies and local communities. Involving women and addressing gender issues could be particularly difficult because women are at a disadvantage due to the lack of legal frameworks, policies, and programs that consider their needs and protect their rights; limited access to resources; lack of a political voice; and disproportionate power relations between the genders in households and communities.
- Normalizing the artisanal and small-scale mining sector, which constitutes an extremely important constituency in many mineral jurisdictions. Often artisanal and small-scale miners are trapped in a poverty loop that they have difficulty escaping. They use rudimentary equipment and techniques because their access to knowledge and finance is limited. Many miners also lack the business skills and information needed to enhance the economics of their operations. Environmental impacts are serious and labor conditions harsh. Access to extension services and other administrative support seldom exist. Incidents of child labor, crime, and gender-based violence are widespread in places.
- Facilitating cooperative action at the regional level and moving away from competition for foreign investment. This allows neighboring countries to pursue common development objectives.⁴⁴

Domestication of the Africa Mining Vision through Country Mining Vision

The tenets of the AMV encompass a broad array of economic sectors, well beyond the extractive resources sector. The vision seeks to engage government institutions and stakeholders in changing the way agencies function to ensure well-designed, predictable processes and consistency in dealings among government, businesses, and communities. Collaboration, coordination, transparency, and communication underpin the strategic planning necessary for long-term sustainable development. Multiple stakeholders, often with competing interests, need to have an understanding of the stakes at play.

To implement the AMV at the country level, the AMDC engaged with leading experts to develop the *CMV Guidebook*, which articulates clear-cut guidelines and options for aligning a country's mining policies to the principles of the AMV.⁴⁵ Developing a CMV involves multi-stakeholder consultations to formulate a shared vision on how resource exploitation can promote broad-based development and structural transformation of the country's economy.

The *CMV Guidebook* provides a step-by-step method for strategic assessment, policy dialogue, and sector analysis, as well as mechanisms for conducting stakeholder consultations, including steps for policy design and formulation of a CMV implementation, monitoring, and evaluation tool. The CMV is intended to enrich, not replace, countries' existing economic strategies and national development plans.⁴⁶ The goal is to achieve institutional cohesiveness, whereby sectors pursue coherent policies that ensure a transformative role for extractives in the economy.

The CMV seeks to establish a change process. The trajectory of change and reform often hinges on the maturation of mining or petroleum industry in the country. In a mature regime, there might be a predisposition to conducting business in the usual way; a resistant mindset could emerge among influential policy-makers. In other economies where resource development is an emerging sector, starting fresh can have fewer barriers to introducing AMV-compliant petroleum and mineral regimes.

Lesotho case

Lesotho represents a model case of formulation of a CMV where the AMDC was able to conceptualize, design, and institute the process toward a CMV from the outset and maintain an ongoing commitment toward building the relevant institutions. The AMDC was able to work collaboratively with Lesotho's agencies and introduce best practices for relevant policies, processes, and procedures.

Lesotho is a small land-locked country and is not historically a mineral-based economy. The government commissioned new mining operations, but existing regulations were not adequate for good governance of the sector. Development of a CMV began with a government review of the 1962 Mining and Mineral Policy, with the support of the AMDC and UNDP. The review identified the need to improve mineral resource management, maximize revenue collection and utilization, and increase impact of mineral extraction both at the national and local level.⁴⁷ An inclusive working group was established to drive the CMV

in Lesotho. The Multi-Stakeholder Working Group comprised forty people from several ministries including the Mining Ministry, Economic Development and Finance, as well as non-governmental organizations, local communities, the private sector, and small-scale miners. Workshops were held in 2013 that identified issues and proposed themes to guide preparation of an AMV-compliant Mining and Mineral Policy.

Using a draft Mining and Mineral Policy for discussion, the working group facilitated extensive consultations in 2014 with more than 600 people from 10 administrative districts. The new mineral policy was adopted in June 2015 and is expected to provide strategic direction for the development of Lesotho's mineral resources and ensure that the sector contributes to socioeconomic development and transformation. Many of the new elements of the policy will require further development of the existing legal and regulatory framework. The AMDC is assisting with preparing proposed mining legislation. The process proved very effective partly because of the absence of already developed policies in the mineral sector. The AMDC was able to work collaboratively with Lesotho's agencies and introduce best practice

Experience shows that no one-size-fits-all approach works in the CMV process, but some key implementation lessons have emerged.⁴⁸ The importance of strategic framing for dialogue is paramount. This includes understanding the characteristics and dynamics of the political and economic institutions and how they operate in the country. It is important to appreciate how the linkages between ministries, commissions, and other relevant agencies function. In developing the CMV, it is critical to disentangle the various agencies and to allocate respective roles for implementing the AMV. Initial engagement with a country's top leadership is essential so that leaders can assign an agency, preferably one linked to the head of state, to drive the process.

Another lesson is to appreciate how the country's administration and regulatory processes intersect with mining, including allocation of mineral rights and management of impacts and revenue. While adequate legislation might exist, domestic political interests affect the coordination and capacity of institutions to function effectively, and this effect can become more pronounced where forceful regional or ethnic interests are at stake. Understanding the principles of the AMV is sometimes not enough, since these forces can take sway over proper project planning and allocation of resources. For example, the AMV emphasizes the need for infrastructure development, but domestic politics might influence the location or nature of that development. These same forces can act to supersede principles for regional cooperation in favor of satisfying a political or ethnic constituency.⁴⁹

The nature of the strategic planning exercise is critical in this regard. If the voices advocating framing policy around the AMV are few, the prospects for transformation will be dim. Strong domestic champions are needed to sway the policy elite. In many ways, the policy champions are as important as advocates with technical knowledge of the sector.

Strong national ownership of the CMV process also must be achieved. Although government-led, it must be inclusive enough to promote broad consensus on how to ensure that mining policies outlast political and electoral cycles. A multi-stakeholder approach that takes into account the perspectives of civil society and

community-based organizations, local administrations, and the private sector is fundamental to promoting a realistic view of what benefits the extractives sector can deliver and how they can deliver them. The development of a CMV works best when it is steered by a multi-stakeholder coordinating body or task force dedicated to overseeing the entire process.

Mozambique case

Mozambique exemplifies a country that has embarked on policy and regulatory reform in the mining sector and has used the AMV to contribute to the process. Prior to adopting the AMV in 2009, Mozambique had ratified the Southern African Development Community Protocol on Mining in 2000 to create a sector that would contribute to economic development, poverty alleviation, and an improved standard and quality of life in the region.⁵⁰ Then in 2013, the World Economic Forum, in collaboration with UNECA and UNDP Mozambique, held the Responsible Mineral Development Initiative roundtable in Maputo. The dialogue identified five areas for action: (1) increasing the skilled workforce through training programs; (2) making the Extractive Industries Transparency Initiative (EITI) a permanent forum for multi-stakeholder dialogue on the extractive sector; (3) prioritizing work on local content issues; (4) funding and implementing the Ministry of Mineral Resources communication strategy and outreach; and (5) improving integrated land-use and infrastructure planning.⁵¹

The outcomes of the roundtable informed the formulation of the country's Mineral Resources Policy and Strategy (PERM), which was approved in 2013. The policy was drafted after discussions with a variety of ministries and institutions, including provincial governments, civil society organizations, and private sector partners and associations.

The Mining Law was approved by parliament in 2014 with the objective to regulate the use of mineral resources in accordance with the PERM.

As part of its program Extractive Industries for Sustainable Development in Mozambique, UNDP Mozambique conducted stakeholder policy dialogues in 2016, one of which addressed the impact of declining mineral commodity prices on sustainable development.⁵²

As a follow-up to the dialogue, the Ministry of Mineral Resources and Energy in Mozambique, with the support of UNDP Mozambique, developed the Implementation Plan of the Mineral Resources Policy and Strategy (PI PERM). The PI PERM was the fruit of consultations of many partners, including government at central and provincial levels and all relevant ministries, the private sector, civil society organizations, women's organizations, and academia.

The PI PERM, approved in 2017, was seen as an efficient tool for planning, strategy setting, program delivery, identification of partners and partnership building, and division of labor.⁵³ The PI PERM can be considered as a CMV for Mozambique since it follows, to a large extent, the CMV process as described in the *CMV Guidebook*.⁵⁴ Indeed, the Mozambican process started with the organization of (1) a high-level roundtable and dialogue on extractives; followed by (2) a review of existing legal, institutional and regulatory frameworks that led to the formulation

of the Policy and Strategy of Mineral Resources, significantly compatible with the AMV principles. The Implementation Plan (3) for integrating mining into national development visions and plans (the PI PERM) was then elaborated, informed by the outcomes of (4) dialogues, followed by (5) the elaboration of an effective communication strategy, and (6) the provision of technical support to stakeholders at local and national levels to facilitate consultations with local communities and national stakeholders.⁵⁵ This led to the (7) enhancement of capacity for long-term visioning, strategy setting and integrated development and planning.

Several factors contributed to Mozambique's success at domesticating the AMV: (1) high-level ownership of the process; (2) the presence of an active UNDP at the country level that served as a trusted broker and provided valuable technical and financial support to foster interinstitutional and intra-agency collaborations; multi-stakeholder dialogues; and intersectoral synergies to promote the AMV and to oversee the development of the PI PERM (the CMV); and (3) the emergence and proliferation of AMV champions at several levels, including government institutions and civil society organizations. The challenges ahead are to secure coordination commitment from all stakeholders in implementing the workplans agreed on; to earmark resources for interventions included in the PI PERM, and actual implementation of the PI PERM to achieve the sustainable development desired.

Shifting paradigms under the Africa Mining Vision

Busia and Akong stress that institutional processes under the AMV do not call for a business-as-usual approach. The AMV policy discourse goes beyond optimizing the revenue potential of mining by making improvements to legal and regulatory frameworks, tweaking mineral fiscal regimes, or creating a stable business environment. It opens space for a fundamental, structural change away from maximizing revenues toward harnessing mineral resources for broad-based development.⁵⁶

Market volatility is recognized by scholars as the key problem plaguing an extractive-led development agenda. Commodity prices rise and fall, often in unpredictable patterns that create vulnerability, risks, and crises.⁵⁷ Busia and Akong argue that the current commodity downturn presents an opportunity for African countries to implement the AMV as a forward-looking, multidimensional instrument for change. Their analysis of the current crises facing the extractive sector in Africa concludes that disruptive events open windows of opportunity and are important drivers of paradigm shifts. "The outcomes depend on varied factors including how the AMV ideational foundation is capable of organizing interests, institutions, actors and power for change."⁵⁸

The trajectory of change under the AMV is inherently complex, dynamic, and difficult to predict. The AMDC's evaluations of scenarios for change find that implementation of AMV in different countries will be non-linear and incremental. Although the ideational foundation of the AMV is sound, resistance to change by entrenched interests and actors is likely.⁵⁹

For instance, development partners remain influential actors in policy development and implementation across Africa. Whereas donor countries might advocate for global principles in line with the AMV, at the bilateral level they are wedded