

Mineral Governance Barometer:

Southern Africa

Professor Rod Alence & Professor Robert Mattes



Credits:

OSISA SARW Team Dr Claude Kabemba
Moratuo Thoke
Percy F. Makombe

OSISA Production Team Dorothy Brislin
Bukeka Mkhosi

Design & Layout Michéle Dean, Limeblue Design

Copy Editor: Melody Emmett, Matters Arising

© December 2016



1 Hood Avenue
148 Jan Smuts Avenue
Rosebank PO Box 678,
Wits 2050 Johannesburg

Tel: +27(0) 10 590 2600

 @OSISA



1 Hood Avenue
148 Jan Smuts Avenue
Rosebank PO Box 678,
Wits 2050 Johannesburg

Tel: +27 11 587 5000

 @THESARWATCH

Mineral Governance
Barometer:
Southern Africa

Professor Rod Alence
University of the Witwatersrand

Professor Robert Mattes
University of Cape Town

Acknowledgments

The Open Society Initiative for Southern Africa (OSISA) through its Natural Resource project, the Southern Africa Resource Watch (SARW), was fortunate to secure the services of Professors Rod Alence and Robert Mattes from the University of Witwatersrand and University of Cape Town respectively, as lead researchers for this pilot project on measuring resource governance in Southern Africa. My sincere appreciation to them.

Thanks also to members of the research team. The data used to compile the report was provided by carefully selected country researchers:

- Wole Olaleye for South Africa
- Dr Patience Mutopo for Zimbabwe
- Nancy Kgengwenyane for Botswana
- Edward Lange and Juliana Chileshe for Zambia
- Rachel Etter-Phoya for Malawi
- Tim Healy for Madagascar
- Arthur Kaniki for the Democratic Republic of Congo (DRC)
- Maximillian Weylandt for Namibia
- Dr Sabelo Gumedze for Swaziland
- Lehlohonolo Chefa for Lesotho

Each of these researchers worked hard to collect data in a short period of time. Their engagement in meetings and email exchanges and their comments on draft reports over a period of one and a half years contributed to shaping the content of the report.

I would also like to express my deepest appreciation to my colleagues Percy Makombe and Moratua Thoke, programme manager and programme assistant respectively. Mr Makombe was the coordinator of the research. Ms Thoke provided administrative support to the project.

Dr Claude Kabemba
Director, Southern Africa Resource Watch
Johannesburg

Contents

Introduction	1
What is Mineral Governance?	2
Mineral Governance in Action	3
Mineral Governance in Potential	4
Measuring Mineral Governance	4
Measuring Mineral Governance in Potential	6
<i>State Capacity</i>	
<i>State Accountability</i>	
<i>The Relationship Between State Capacity and State Accountability</i>	
Measuring Mineral Governance in Action	13
<i>Regulation</i>	
<i>Monitoring and Enforcement</i>	
<i>Regulatory Presence</i>	
<i>The Relationship Between Mining Governance in Potential and Mineral Governance in Action</i>	
Unpacking Mineral Governance by Issue-Area	25
The Issue-Areas:	
<i>National Economic and Fiscal Linkages</i>	
<i>Community Impact</i>	
<i>Labour</i>	
<i>Environment</i>	
Mineral Governance by Issue-Area	27
Artisanal and Small-Scale Mining (ASM): An Additional Issue-Area	30
An Aggregate Indicator of Mineral Governance	32
Conclusion	36
References	38
Appendix: Statistical Summaries	40

FIGURES

- Figure 1: State Capacity (scores with confidence intervals)*
- Figure 2: State Accountability (scores with confidence intervals)*
- Figure 3: Association between State Capacity and Accountability*
- Figure 4: Regulation (scores with confidence intervals)*
- Figure 5: Association of Regulation with Capacity and with Accountability*
- Figure 6: Monitoring/Enforcement (scores with confidence intervals)*
- Figure 7: Association between Regulation and Monitoring/Enforcement*
- Figure 8: Association of Monitoring/Enforcement with Capacity and with Accountability*
- Figure 9: Regulatory Presence (scores from components)*
- Figure 10: Regulatory Presence (scores with confidence intervals)*
- Figure 11: Association of Regulatory Presence with Capacity and with Accountability*
- Figure 12: Regulatory Presence by Issue-Area (scores from components)*
- Figure 13: Regulation by Country and Issue-Area*
- Figure 14: Regulatory Presence by Country and Issue-Area*
- Figure 15: Artisanal and Small-Scale Mining (ASM)*
- Figure 16: Aggregate Mineral Governance (scores with confidence intervals)*

TABLES

- Table 1: Mining in Ten Southern African Countries*
- Table 2: Correlations between the Aggregate Indicator and its Four Components*
- Table 3: Univariate Descriptive Statistics*
- Table 4: Selected Bivariate Correlations*
- Table 5: Mineral Governance Indicators (estimates and standard errors)*

BOXES

- Box 1: Measuring State Capacity*
- Box 2: Measuring State Accountability*
- Box 3: Measuring Mining Regulation*
- Box 4: Measuring Monitoring/Enforcement and Regulatory Presence*
- Box 5: Measuring Regulation of Artisanal and Small-Scale Mining (ASM)*
- Box 6: Insights from In-Country Researchers (countries ordered by Aggregate score)*

Foreword

Southern Africa is rich in natural resources and has significant reserves of several of the world's most strategic minerals like gold, platinum, diamonds, chrome, manganese, copper, uranium, nickel, and cobalt. How these mineral resources are managed has implications for development outcomes and the fight against poverty, inequality, and unemployment. Extractive industries represent a potential source of wealth for **Southern African Development Community (SADC)** economies and a variety of benefits, including industrialisation through value addition to minerals; job creation; export earnings, and technology and skills transfer.

Many initiatives exist to promote good governance in the extractive industries. Unfortunately, for most of the SADC countries, mineral extraction and trade are not bringing benefits. The problem is multidimensional and touches the entire chain of production and commercialisation: weak state institutions; insufficient knowledge of the quality and quantity of minerals; weak contract negotiation capability; corruption; weak labour, social and environmental protection; unpredictable and weak fiscal regimes, and weak community engagement and protection.

In response to past failures in the management of mineral resources, there are increasing efforts to ensure that they play a positive role in the development and growth of the region. There are many initiatives in the region monitoring the mining industry with a view to increasing accountability and transparency. However, despite enormous efforts and resources committed to ensuring that minerals benefit citizens, these initiatives have failed to have any significant impact as we continue to attest to the signing of dubious mining contracts; illicit financial flows; corruption; environmental destruction, and human rights abuses.

Currently there is no comprehensive and systematic body of knowledge that analyses the sector in a comparative way in the region so that learning points are created on how countries manage their mining sectors.

The Mineral Governance Barometer is an attempt to close that gap by publishing a research report every two years that systematically and comprehensively assesses progress made by SADC countries towards good governance of their mineral resources. It interrogates the effectiveness of mineral and economic governance in all SADC countries. The Mineral Governance Barometer is a compilation of empirical indicators of the extent and quality of mineral governance in Southern Africa.

In this first issue, which is a pilot study, the focus is on regulatory frameworks and on a state's capacity to implement policies and generally manage the sector. Today's governments are challenged with creating new approaches to governance that enable them to better exploit the developmental potential provided by mineral resources. Establishing regulatory frameworks and state capacity to ensure that activities of mining companies are compatible with efforts to promote inclusive and sustainable development are central to this challenge.

Siphosami Malunga
Executive Director, OSISA.
Johannesburg

Executive summary

Southern Africa is endowed with lucrative mineral resources such as diamonds, gold, copper, coal, platinum, and uranium. This rich endowment can be a major asset in the quest for inclusive and sustainable development, yet mining in Southern Africa has often been criticised as an enclave sector that at best contributes little to economic development and at worst does substantial social and environmental harm. To avoid such pitfalls emerging international consensus emphasises the importance of good mineral governance. This involves the adoption and implementation of regulatory frameworks that promote deeper linkages between the mining sector and the broader economy, and that protect people and the environment from the potentially harmful consequences of mineral extraction.

This pilot study provides a barometer of mineral governance in ten Southern African countries: Botswana, Democratic Republic of the Congo (DRC), Lesotho, Madagascar, Malawi, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe. The barometer takes stock of mining regulations in place at the end of 2015, the extent to which they are implemented, and features of supporting institutions. It is based on the observation that while regulations impose obligations on mining companies, in doing so they directly impose obligations on the state to monitor and enforce compliance, and they also indirectly impose obligations for citizens and civil society to hold the state and mining companies accountable. The barometer includes indicators of mineral governance across four main issue-areas: national economic and fiscal linkages; community impact; labour, and the environment, with artisanal and small-scale mining (ASM) treated as a special topic. The barometer also includes indicators of state capacity and state accountability with respect to mineral governance.

Specialist researchers collected the data used to calculate the indicators in each country using a standardised research instrument. The in-country researchers collaborated in developing and refining the instrument during two workshops. An important feature of the data set is that it consists of objective descriptions of patterns of regulation and implementation and of institutional arrangements, not on subjective value judgements. Researchers compiled information from publicly available, although not always easily accessible sources, to capture not only whether a particular regulation exists in a country, for example, but also whether the state has recently detected or penalised any company for failing to comply with regulations.

Key findings can be summarised on three levels: the prevalence of regulations, the extent of monitoring and enforcement, and the importance of accountability.

The prevalence of regulations varies substantially across countries but is generally high, with five of the ten countries having more than two-thirds of the regulations we looked for. The extent of monitoring and enforcement is considerably lower, with only patchy publicly-available evidence of states detecting and punishing non-compliance by mining companies.

Accountability mechanisms that provide pluralistic fora for public participation emerge as the best predictors of monitoring and enforcement. Stated differently, government officials are less likely

to overlook breaches by mining companies when the citizens and civil society are keeping track.

The findings are also helpful in identifying gaps in what we call “regulatory presence” – a composite of regulations, monitoring, and enforcement. Regulatory presence is lower for economic/fiscal linkages and community impact than it is for labour and environmental regulations. One interpretation is that labour and environmental regulations often apply by default across many sectors, while regulations about linkages and community impact are more specific to mineral extraction. A complementary interpretation is that civil society is often better organised around labour and environmental issues, while the affected constituencies in the other issue-areas are more likely to be sectorally fragmented (economic/fiscal linkages) or geographically isolated (community impact).

National mineral governance scores differ in ways that in part reflect the size and importance of a country’s mining sector, but notable exceptions also emerge. The top four countries are well-known mining economies (South Africa, Zimbabwe, Botswana, and Zambia), however the scores of two other well-established mining economies (the DRC and Namibia) are noticeably lower (the DRC with many regulations but weak implementation, and Namibia with few regulations but a better record of implementing them). Lesotho and Swaziland, which have small mining sectors, had the lowest scores; however, the scores of the emerging mining economies of Madagascar and Malawi are noticeably higher, with Madagascar having the greatest regulatory presence on community impact and ASM, and Malawi scoring particularly well on environmental policies.

The barometer provides an empirical baseline for describing mineral governance in the ten Southern African countries in the pilot study. Further research could extend this baseline to other countries and to the petroleum sector to facilitate a broader comparative and statistical analysis. The finding that accountability mechanisms are crucial suggests that further research is likely to more directly probe patterns of contestation across a range of key stakeholders from mining companies and the state to labour unions and civil society organisations. Information about stakeholder priorities and positions would help to identify areas of conflict and consensus and complement the descriptive indicators in the pilot study.

The Authors

Rod Alence is Associate Professor of International Relations at the University of the Witwatersrand. He specialises in political economy and research methodology, with a regional focus on sub-Saharan Africa. He also has extensive teaching and research experience in the political economy of Africa's natural resources.

He was a Visiting Associate Professor of Political Science at the University of Michigan, Ann Arbor during the 2008-2009 academic year, and he continues to participate in the university's African Social Research Initiative, for example teaching short courses in quantitative research methods in Ghana and Mozambique. He has previously been based at institutions including the Human Sciences Research Council, the University of the Western Cape in South Africa, and the Legon Centre for International Affairs at the University of Ghana.

His research has appeared in journals such as *Journal of Modern African Studies*, *Journal of African History*, *Journal of Democracy*, and *Development Southern Africa*. He holds a PhD in Political Science from Stanford University (2001), and he won the American Political Science Association's annual award for best PhD dissertation in the field of political economy.

Robert Mattes is Professor of Political Studies and Director of the Democracy in Africa Research Unit in the Centre for Social Science Research at the University of Cape Town. He is also Senior Adviser to, and co-founder of Afrobarometer, a ground-breaking regular survey of public opinion in 35 African countries.

Mattes has helped to launch and run other major research projects such as the African Legislatures Project, and the South African National Election Study.

His research has focused on the development of democratic attitudes and practices in South Africa and across the continent. He is co-author (with Michael Bratton and E. Gyimah-Boadi) of *Public Opinion, Democracy and Markets In Africa* (Cambridge University Press, 2005), and co-editor (with David Denemark and Richard Niemi) of *Growing Up Democratic: Does It Make A Difference?* (Lynne Rienner Publishers, 2016).

He has authored or co-authored articles in journals such as *American Journal of Political Science*, *British Journal of Political Science*, *World Development*, *Journal of Democracy*, *Democratization*, and *Party Politics*. He is a member of the Academy of Science of South Africa, and holds a PhD in Political Science from the University of Illinois, Urbana-Champaign (1992).

The Research team

Dr Sabelo Gumedze, *Swaziland*

He is a Visiting Senior Research Fellow at the School of Law at the University of the Witwatersrand. holds a Doctor of Social Science (International Law) from Åbo Akademi University, Finland; a Licentiate of Licentiate of Social Sciences (International Law) from Åbo Akademi University, Finland; a Master of Laws (LLM) in Human Rights and Democratization from the University of Pretoria, South Africa; a Bachelor of Laws (LLB) from the University of Swaziland; and a Bachelor of Arts in Law (BA Law) from the University of Swaziland.

Juliana Chileshe, *Zambia*

She has been a consultant for more than twenty-five years on wide ranging subjects such as environment, education and development. Additionally, she has served as an International Union for Conservation of nature (IUCN) councillor at a global and southern African region level. She also served as a vice chairperson of the commission of education and communication in IUCN. She has also previously worked been employed by for the World Wide Fund for Nature, the Panos Institute for Southern Africa, and the University of Zambia.

Edward Lange, *Zambia*

He has been Country Coordinator for the Southern Africa Resource Watch project (SARW) in Zambia. He has been working on a range of initiatives around Natural Resource Governance in the SADC region and Zambia in particular. Edward has led several CSO's advocacy initiatives in Zambia on the entire mineral value chain, including issues of transparency, accountability and good environmental management practices in the sector. He holds a BA – Human and Social Studies (Major in Development Studies) from the University of South Africa as well as a Law Diploma from the University of Zambia.

Lehlohonolo Chefa, *Lesotho*

He is a graduate from the National University of Lesotho. He is a Joint Japan World Bank Scholarship Programme Alumnus - MA Economic Policy Management. He is also the founding Executive Director of the Policy Analysis and Research Institute of Lesotho (PARIL). He has written a number of papers and reports at both national and international levels including the African Integrity Indicators (2014, 2015 and 2016), Ownership of Mineral Rights in Lesotho (2014) and the 2014 Report on the Most Open and Secretive Government Institutions in Lesotho.

Prof. Arthur Kaniki Tshamala, *DRC*

He holds a Doctorate in Engineering Sciences (Mineral Engineering and Environment) from the University of Liège (Belgium). He is a Professor at the University of Lubumbashi and Honorary Vice-Dean at the Faculty of Polytechnic. He currently teaches in several universities of the DRC and develops skills on the environmental impact of mining and hydrocarbons

activities. He is a consultant to several international organizations including UNECA, WWF and the DRC Senate.

Dr Patience Mutopo, Zimbabwe

She holds a PhD awarded with a Magna Cum Laude from the University of Cologne, Germany and has been a Post-Doctoral Research Fellow at the University of Cologne Germany. She has extensive experience in land and agrarian reforms, gender based research, livelihoods analysis, climate change adaptation strategies, migration and development, policy analysis and the impacts of mining trends on rural livelihoods. She is currently a Senior Lecturer in the Centre for Development Studies, Chinhoyi University of Technology, Zimbabwe. She is the coordinator of the multi-disciplinary Msc Degree Programme in Sustainable Technologies and Livelihoods.

Tim Healy, Madagascar

He has over 27 years of experience in the field of natural resources management and economics initiated in Europe and now over 23 years in Africa and Madagascar. He has also worked in Europe, as an environmental consultant within an international consultancy specializing in environmental management and impact analysis. Later he was an independent consultant attached to institutes of environmental research in Namibia (4 years). Many of his studies have involved Environmental Impact Assessments.

Rachel Etter-Phoya, Malawi

She has been working in the extractives industries with a focus on Malawi. She currently serves as a Head of Accountability, Policy and Programmes with Citizens for Justice in Lilongwe, Malawi, and sits on the Malawi Extractives Industries Transparency Initiative Multi-Stakeholder Group. Prior to this, Rachel consulted as Senior Revenue Specialist for the Revenue Development Foundation in Malawi's Ministry of Natural Resources, Energy and Mining.

Wole Olaleye, South Africa

He is an independent research consultant with over 15 years' experience gained from working in various capacities as researcher, policy and programme manager, and consultant on research projects at national, continental and international levels across sectors. This includes but is not limited to studies on post-war reconstruction societies, national and international migration studies, programme design, monitoring and evaluation, democratic governance, Africa inter-state institutions, Africa's foreign direct investment flows and outflows, and climate change. He holds a LTh; B.A (Hons.) Social Development; M.Phil. (Social Science Research Methodology) from University of the Western Cape and University of Stellenbosch respectively. He is a visiting research associate at University of Witwatersrand School of Governance, Centre for Learning, Evaluation and Results.

Nancy Kgengwenyane, Botswana

She obtained her LLM degree from Australian Centre for Climate and Environmental Law (ACCEL), Sydney Law School, University of Sydney, NSW, Australia. She obtained her LLB degree from the University of Botswana. She has over 22 years of experience working as an environment and natural resources lawyer at national, regional and international levels in the area of mining, climate change, water resources, environment; human and social development.

Nancy's experience includes working for the public service, private sector, UNDP, USAID and with the United Nations Economic Commission for Africa (Addis Ababa, Ethiopia) as a Regional Advisor on Natural Resources Development (mining, energy and water).

Max Weylandt, *Namibia*

Max Weylandt is a Research Associate with the Institute for Public Policy Research (IPPR) in Namibia. He focuses on the analysis of governance issues. He holds a Master's degree in Development Studies from the University of Oxford. The IPPR was established in 2001 as a not-for-profit organisation with a mission to deliver independent, analytical, critical yet constructive research on social, political and economic issues that affect development Namibia.

Michael O'Donovan, *statistical support*

Michael O'Donovan is an independent social science researcher with decades of experience applying statistical methods to the analysis of large data sets. In recent years governance issues have been central to his work, particularly measuring governance quality and its impact. He has worked with diverse clients including the SABC (Digital News), the Multi-Level Governance Initiative (at the University of the Western Cape's Dullah Omar Institute), UN Women (Rwanda), the World Bank, and the Human Sciences Research Council.

Mineral Governance

Barometer: Southern Africa

Introduction

Southern Africa is endowed with lucrative mineral resources – such as diamonds, gold, copper, coal, platinum, and uranium – and some countries possess large mineral reserves. The region also has a legacy of colonial or settler regimes – regimes that often privileged the interests of mining companies over the welfare of local inhabitants and the protection of the environment. A rich mineral endowment can be a major asset in the quest for inclusive and sustainable development. Yet deficiencies in mineral governance have fuelled the criticism that the mining sector is an enclave that at best contributes little to development and at worst does substantial social and environmental harm. Governments in Southern Africa face the challenge of better exploiting the developmental potential of their mineral resources.

Establishing regulatory frameworks to align the activities of mining companies with inclusive and sustainable development is central to the challenge of mineral governance. An emerging global consensus emphasises the need to regulate mining “every step of the way, from discovering minerals in the ground, to extracting them and transforming them into sustainable development” (World Bank 2016; also see Barma et al. 2012; Campbell 2003). Regulatory frameworks must in this view promote deeper linkages between the mining sector and the national economy, and they must protect people and the environment from the harmful consequences of mineral extraction. Within Africa the outlines of a “blueprint” for development-oriented mining is emerging – for example, in the African Union’s (2009) Africa Mining Vision and in efforts to harmonise mining regulations in Southern Africa (United Nations Economic Commission for Africa and Southern African Development Community 2004).

While enacting an appropriate regulatory framework is crucial, it is only a first step in establishing effective mineral governance. A regulatory framework only has its desired effects if the government has the capacity and motivation to implement it. The framework itself consists of laws and regulations, many of which impose direct requirements or restrictions on mining companies. In imposing these obligations on mining companies, a government indirectly imposes obligations on itself and on the state – an obligation to monitor company behaviour to detect non-compliance, and an obligation to penalise companies that do not comply. A government is only *able* to meet these obligations if it has access to state machinery with the required administrative capacity, and only likely to be *motivated* to meet these obligations consistently if it operates in an environment in which citizens and civil society can hold it to account. Understanding mineral governance as more than adopting a regulatory blueprint requires attention to implementation, state capacity and accountability.

Despite increasing attention to mineral governance, our ability to compare the records of Southern African countries systematically has remained limited. Some studies offer sweeping analyses of the adverse consequences of failed resource governance throughout Africa (Bond 2006; Burgis 2015; Kabemba 2013). Others provide qualitative detail on specific aspects of mineral governance or in specific countries – for example on international efforts to promote diamond certification (Grant and Taylor 2004) and on the impact of uranium mining on local livelihoods in Malawi (Kamlongera 2013). The World Bank (2016b) recently initiated a project to collect detailed information about mineral governance, though its current coverage is limited, and it emphasises single-country diagnostics. Important cross-national data sources, such as those compiled by the Extractive Industries Transparency Initiative (2010) and Revenue Watch Institute (2013) are concerned primarily with revenue transparency, and their coverage of Southern Africa is patchy. Meanwhile, extensive quantitative research on the “natural resource curse” primarily compares developmental outcomes in resource-rich versus resource-poor countries, rather than analysing differences in resource governance among resource-rich countries (Alence 2015). This all points to a gap in the understanding of mineral governance in Southern Africa. The urgency of Southern Africa Resource Watch’s call for “instruments that will allow for an easy and correct assessment of the manner in which resources are being managed in the region” (2013: 7) is difficult to dispute.

This study attempts to heed this call by putting forward empirical indicators of mineral governance in 10 Southern African countries. The indicators measure state capacity and accountability mechanisms in the sector, and the scope and implementation of regulatory frameworks in four main issue-areas: national economic and fiscal linkages, community impact, labour, and the environment. The special topic of ASM is also explored. While no set of indicators can be definitive, careful attention is given to measurement validity and reliability. We hope the indicators contribute to understanding mineral governance in Southern Africa.

What is Mineral Governance?

Political scientists have defined “governance” as the process of making rules, adjudicating what those rules mean, and enforcing them (Easton 1957). We understand “mineral governance” to consist of formulating laws and official regulations (“rules”) about the extraction and use of mineral resources. Implementation of rules includes monitoring compliance by mining companies and penalising them for non-compliance. As the scope of regulatory frameworks to address economic, social, and environmental consequences of mining has expanded, so have demands on the state to formulate and implement these frameworks. We draw an analogy between aspects of mineral governance and the distinction in physics between kinetic energy (energy in action) and potential energy (energy due to position or arrangement). Our indicators capture what the state does when it governs the mining sector (mineral governance “in action”) as well as attributes of the state that affect its motivation and capacity to pursue socially desirable patterns of mineral governance (mineral governance “in potential”).

Mineral Governance in Action

The African Union's (2009) Africa Mining Vision has informed the issue-areas in which we measure mineral governance in action. Global multilateral institutions (EITI Secretariat 2016; World Bank 2016a) have also increasingly embraced these. We identified and refined these issue-areas in a collaborative workshop with in-country researchers and regional experts. The four main issue-areas in which regulatory frameworks and their implementation are investigated are:

- National economic and fiscal linkages;
- Community impact;
- Labour;
- Environment.

ASM, with its distinctive challenges, is considered separately.

Our indicators of mineral governance in action capture the prevalence of rules and the extent of implementation in the four main issue-areas. In-country researchers used a standardised research instrument to collect evidence by reviewing legislation, official documents, and news media reports, and by interviewing “key informants.” For each prospective rule contained in the instrument, they asked three questions:

1. Does such a rule exist in the country's laws or regulations?
2. Does publicly available evidence exist indicating that an official body has detected non-compliance with the rule by a mining company during the past five years?
3. Is there publicly available evidence indicating that an official body has enforced the rule by imposing a penalty on a mining company within the past five years?

The indicators describe patterns of activity (or the lack thereof) in each country without being value-laden by researchers. In principle, this approach can be replicated by researchers with different subjective views about what good mineral governance should consist of. A disadvantage is that the indicators cannot be interpreted uncritically as measures of quality. For example, there might be an expectation that elaborate regulations to protect local communities imply better governance in a particular issue-area; however, regulations that are poorly conceived or poorly implemented may bring no benefit or even cause harm. In the same way, where companies are regularly found to violate mining laws and are punished for doing so, this does not necessarily mean the state is successfully implementing regulations. If this was the case, companies would be so certain of punishment that they would be deterred from violating laws in the first place.

Mineral Governance in Potential

Capacity and accountability are the two major attributes of a state that pursues socially desirable patterns of mineral governance. Indicators of a state's capacity and accountability enable us to investigate whether they are associated empirically with our indicators of a state in action.

“State capacity” refers to the ability of a state to manage its mining sector effectively. State capacity is required to formulate an appropriate regulatory framework. The state must be able, for example, to collect, disseminate, and analyse information about the size, structure, and impact of its mining sector. Once rules have been formulated, state capacity is needed to implement them. The state must be able to monitor whether mining companies comply with the requirements and restrictions imposed on them, and it must be able to impose penalties for non-compliance. The greater its capacity, the greater a state's potential will be to achieve socially desirable patterns of mineral governance. “State accountability” refers to mechanisms that allow citizens, civil society, and other non-state actors to hold the state (including its political leadership and administrative agents) to its obligations to regulate, monitor, and enforce compliance in the mining sector. Accountability mechanisms include legislative and judicial processes and independent institutions that impose restraints on the use of executive authority. State accountability is crucial in motivating state officials to pursue socially desirable patterns of mineral governance. Without accountability, mineral governance can easily degenerate into a selective, rent-seeking activity, where politicians or state officials relax rules for companies that give favours or pay bribes, and enforce the rules more vigorously for companies that do not. A state that can be called to account for failing to meet its obligations will be motivated to achieve socially desirable patterns of governance in the mining sector.

A state that is capable and accountable is desirable in its own right. However, our aim is to determine whether potential for mineral governance translates into mineral governance in action. Are states that can be held accountable more likely to regulate their mining sectors in ways that are conducive to inclusive and sustainable development? Are states with greater capacity more likely to implement regulations effectively? Our analysis investigates whether our indicators of governance in potential and governance in action go together in practice.

Measuring Mineral Governance

The mining sectors of the ten Southern African countries in our study vary widely in size and importance, as shown in Table 1. South Africa has by far the largest mining industry, earning more than \$29 billion in 2014. It has well over 100 current mining projects with an ore reserve value of at least \$250 million. Swaziland has the smallest mining industry, earning \$11 million in 2014 and lacking any large current projects. The top six countries in the table, listed in order of total mining income, have been major mining economies for a long time. They face the challenges of “mature” industries – including the depletion of high-yield deposits and the accumulated social and environmental consequences of mining and mine closure. The DRC and Botswana stand out as the most economically dependent on mining, which in 2014 accounted for more than one-fifth of their GDP. The bottom four in the table have smaller mining sectors

that have grown in recent years. Since the discovery of lucrative diamond deposits in Lesotho, for example, mining has grown from a negligible share of GDP to 8.7 percent.

Table 1: Mining in Ten Southern African Countries

	Number of Mining Projects	Total Mining Income (US\$ millions, 2014)	Mining (per cent of GDP)
South Africa	143	29,454	8.4
Congo, DR	23	7,759	23.7
Botswana	17	4,017	25.3
Zambia	10	1,774	6.5
Namibia	11	1,593	12.4
Zimbabwe	13	1,340	9.4
Lesotho	4	190	8.7
Malawi	3	59	1.1
Madagascar	6	36	0.3
Swaziland	0	11	0.3

Note: "Number of mining projects" is those with assessed ore reserve value of more than \$250 million (Banerjee et al. 2015); total mining income and mining (per cent of GDP) are from SADC 2014.

Differences in the size and history of the mining sectors in the 10 countries are relevant as we turn to the indicators of mineral governance. We might, for example, expect to see greater regulatory attention given to mining in countries with large industries that account for large shares of GDP. However, smaller industries also tend to have higher rates of growth, and arguably an active regulatory presence is especially important when new mining projects are being developed. History may also matter, as approaches to mineral governance in Africa have changed substantially over time. They have fluctuated between emphasising private versus state ownership, and over time concerns about social and environmental impact have received more attention. Countries with long-established industries are more likely to approach mineral governance in ways that reflect the residue of experience, while countries with emerging industries may be more influenced by current ideas about best practice.

Measuring Mineral Governance in Potential

State Capacity

The capacity of a state, particularly for collecting and disseminating data about the size, shape, performance and impact of the mining industry, makes it possible to develop an informed regulatory framework that can be implemented effectively.

The state capacity indicator determines whether a state carries out regular geologic surveys; whether the relevant ministry has access to basic research, legislative drafting, and legal expertise; whether data on the size, income, and fiscal contribution of the mining industry is accessible, and whether senior ministry officials have personal computers and Internet access. It also includes information on the frequency with which a state publishes information on the operations of mining companies, the fiscal contribution of mining, the social impact of mining, and whether a ministry has its own website.

There are 27 separate items in the state capacity indicator, each scored between zero and one. These items, listed in Box 1, are clustered in six thematic sub-indicators. Each country's state capacity score is a simple average of the six sub-indicators, which mathematically must fall between zero and one. A country with a score of zero would lack all 27 attributes investigated, and a country with a score of one would possess all 27 attributes. A score of zero does not imply that a country has no state capacity at all, just as a score of one does not imply that a country has perfect state capacity. The scores simply reveal the proportion of 27 attributes in place in each country.

Box 1: Measuring State Capacity

The indicator of State Capacity consists of 27 individual items:

Does the Ministry or Department with responsibility for the mining sector have access to:

- Legislative drafting expertise?
- Research support staff?
- Legal expertise on issues relevant to mining?

Does the Ministry or Department with responsibility for the mining sector have access to IT capacity:

- Have its own website?
- All or nearly all senior staff have computers with internet access?

Does the Ministry or Department with responsibility for the mining sector have access to official data:

- Regular geological survey data?
- Total national mineral reserves?
- Total income of the mining sector?
- Taxes, commissions, and royalties paid by mining companies?

How often does an official body publish data on:

- Gross earnings of the mining sector?
- Investment in mining exploration and development?
- Costs of mineral extraction (production)?
- Production or earnings data broken down by mining company?
- Cost of state subsidies to mining sector?
- Taxes paid by the mining sector?
- Royalties and non-tax payments to state by mining sector?

How often does an official body publish:

- A registry of mining companies operating in the country?
- Social impact assessments produced before new mining contracts are awarded or new projects are implemented?
Social impact assessments for ongoing mining contracts or projects?

How often does government publish information on:

- Mining sector contributions to national infrastructure (e.g., transport, energy, water)
- Mining sector contributions to dedicated national development fund (e.g., education, housing, social development)
- Total employment in mining sector
- Employment of foreign nationals by mining sector
- Employment of domestic technical staff in mining sector
- Technical training to domestic staff in mining sector
- Mining inputs (e.g., capital goods, consumables, services) procured from domestic suppliers
- Extracted minerals processed within the country

Figure 1 shows that the average score is 0.54, meaning that many countries lack key elements of state capacity. Countries and their scores are presented in traffic-light colours to show whether their scores fall in the bottom third of the scale (red), the middle third of the scale (amber), or the top third of the scale (green). South Africa and Botswana are in the green range, comfortably outperforming the rest, with more than 90 percent of the attributes we investigated. This is not surprising, since South Africa has by far the largest mining sector in dollar terms, while Botswana has the largest mining sector as a share of GDP. Zimbabwe, Namibia, Madagascar, Malawi, Swaziland, and Zambia are in the amber range. The bottom two countries, the DRC and Lesotho, are in the red range. The weak showing of the DRC is particularly striking: it is a major mining economy that ranks second in mining income and in a share of GDP, yet it possesses less than one-third of the state capacity attributes. Zambia is also a major mining economy with a disappointing score, perhaps partly reflecting difficulties adapting the state’s role in the wake of major privatisation reforms in the mining sector. Lesotho’s position at the bottom of the rankings is less surprising, given its small mining sector. However, the sector has been growing rapidly and weak state capacity could hinder the country’s ability to harness its resources effectively.

Figure 1: State Capacity (scores with confidence intervals)

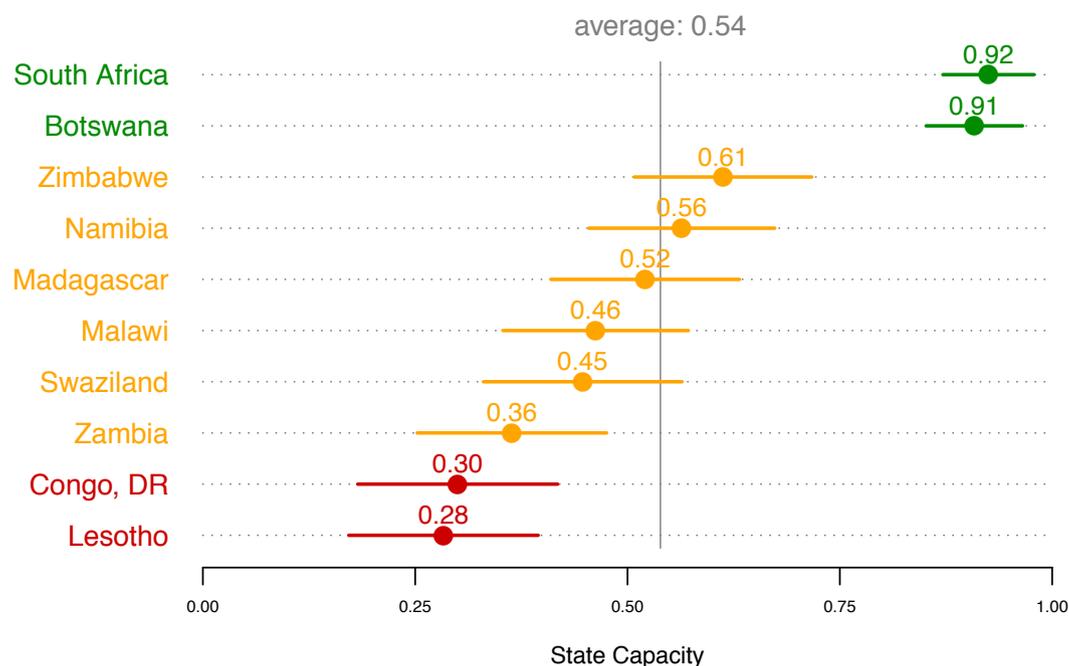


Figure 1 also includes “confidence intervals” as horizontal lines around each score. The scores themselves (dots) are always our best estimates of the characteristics in question. The confidence intervals are statistical estimates of the scores’ reliability. The intervals are calculated to show the reliability of differences between scores. If two countries’ confidence intervals do not overlap horizontally, we can be 90 percent confident that the country to the right outperforms the

country to the left. For example, Madagascar's state capacity score is 0.52. We can be confident that Madagascar's score lags behind Botswana's (0.91) and exceeds Lesotho's (0.28), because their confidence intervals do not overlap. But we should be much more cautious about claiming that Madagascar's score lags behind Namibia (0.56) or exceeds Malawi's score (0.46), because their confidence intervals overlap considerably. (Technical details are reported in Table 5, in the appendix.)

State Accountability

The propensity of a state to translate mineral resources into inclusive and sustainable development is likely to depend on mechanisms of state accountability. Legislative and judicial mechanisms, and the role played by independent institutions in limiting the scope of executive authority allow citizens, civil society, and other non-state actors to hold a state to its obligations to establish and enforce regulations in the mining sector. An unaccountable state could fortuitously act as if guided by a benevolent dictator but its political leadership and administrative agents could be tempted to establish and enforce regulations selectively – corruptly extorting benefits from mining companies, or colluding with mining companies at the expense of its citizenry. While state capacity gives a government the ability to govern effectively, accountability mechanisms give it the motivation to do so.

The indicator of state accountability is based on 32 items, listed in Box 2. Most pertain to legislative and other independent, constitutional institutions through which government officials (and indirectly mining companies that collude with them) can be held accountable. The time frame investigated was the five-year period up until the end of 2015. A central focus was the legislative committee responsible for mining and any other consultative forums in which mining legislation is proposed and overseen. Some items pertained to the expertise available to these institutions, as well as participation by trade unions, business organisations, civil society groups, and political parties. Others focused on the activities of the legislative committees – whether they proposed or reviewed legislation and whether they convened oversight hearings on issues ranging from government contracts with mining companies, to mining companies' compliance with applicable laws, to the government use of revenue derived from mining. Some items focused on whether an independent, statutory body (like an Ombud or Public Protector) exists and receives public complaints related to the mining sector. Others probed whether the government publishes information about gifts and other benefits that mining companies provide to government and government officials. Finally, the indicator includes information about civil-society organisations and non-state news media. These 32 items are clustered into eight sub-indicators. The state accountability indicator is the average of the sub-indicators.

Box 2: Measuring State Accountability

The indicator of State Accountability consists of 32 items:

How often does government publish information about:

- Gifts to government officials by businesses or citizens?
- Business sponsorship of official trips by government officials?
- Business sponsorship of official government meetings?
- Business donations to the ruling party?
- Business donations to opposition parties?

How often do:

- Opposition parties participate in parliamentary mining forum consultations?
- Opposition parties participate in civil society mining forum consultations?
- Business organizations participate in parliamentary mining forum consultations?
- Business organizations participate in civil society mining forum consultations?
- Labour unions participate in parliamentary mining forum consultations?
- Labour unions participate in civil society mining forum consultations?
- Non-governmental organizations participate in parliamentary mining form consultations?
- Non-governmental organizations participate in civil society mining forum consultations?

Does the legislative committee with responsibility for the mining sector have:

- Access to legal expertise on issues relevant to mining?
- Access to legislative drafting expertise?
- Its own research support staff?
- The power to require government ministers and officials to appear and answer questions?

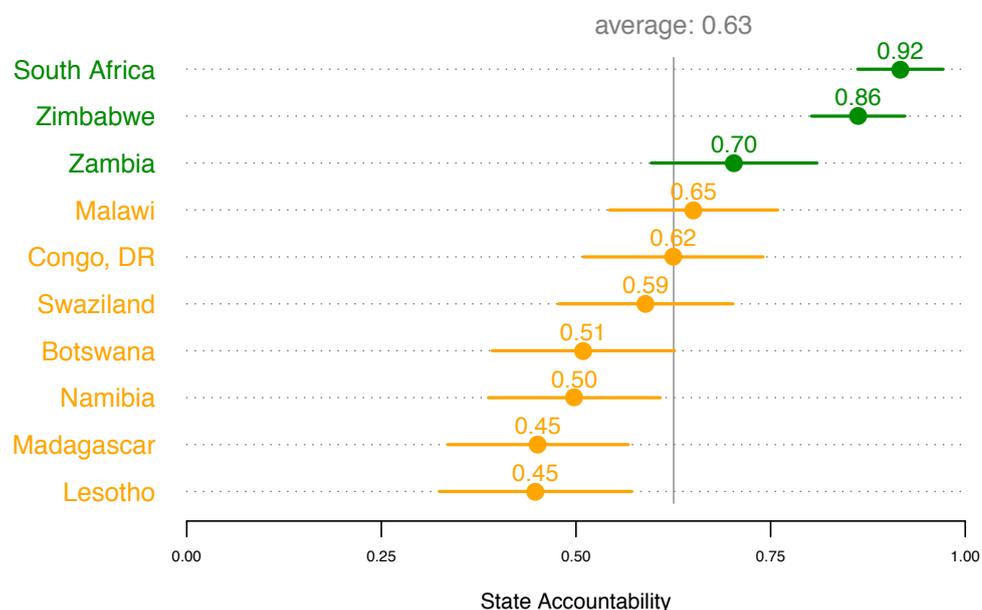
Has the legislative committee with responsibility for the mining sector:

- Discussed new legislation related to mining?
- Recommended amendment of existing, or adoption of new legislation related to mining?
- Heard evidence or testimony in hearings from trade unions?
- Heard evidence or testimony from Chamber of mines or individual mining companies?
- Heard evidence or testimony from civil society organizations?
- Held oversight hearings on government contracts with mining companies?
- Held oversight hearings on government bid/tender processes in mining?
- Held oversight hearings on government use of income from mining?
- Held oversight hearings on mining companies' compliance with laws and regulations?

- Is there an independent statutory body such as an Ombud or Public Protector through which citizens or organisations may lodge complaints about mining companies compliance with licenses, contracts, or the law?
- Has this independent statutory body heard complaints or grievances against mining companies?
- Has this Independent statutory body recommended any actions against mining companies?
- Is there formal multi-sectoral coordination between different ministries, departments, and or official bodies with regard to monitoring and reporting on operational aspects of environmental impact requirements for mining?
- The number of civil society organizations active on mining issues (to a maximum of 5)
- Is there a non-state newspaper/publication that reports extensively on the mining industry?

Figure 2 shows that the average state accountability score is 0.63, exceeding the average state capacity score. South Africa again leads, with more than 90 percent of the attributes investigated. Botswana, which scored highly on capacity, gets a much lower score on accountability, with approximately half the accountability attributes. Zimbabwe scores almost as well as South Africa on accountability. This may reflect improvements in its legislature under the government of national unity at a time of considerable donor support. Madagascar and Lesotho again score at the low end, with less than half the attributes. According to the accountability scores, many states lack mechanisms and patterns of engagement through which citizens, civil society, and other non-state actors can hold the state to its obligations to promote inclusive and sustainable development.

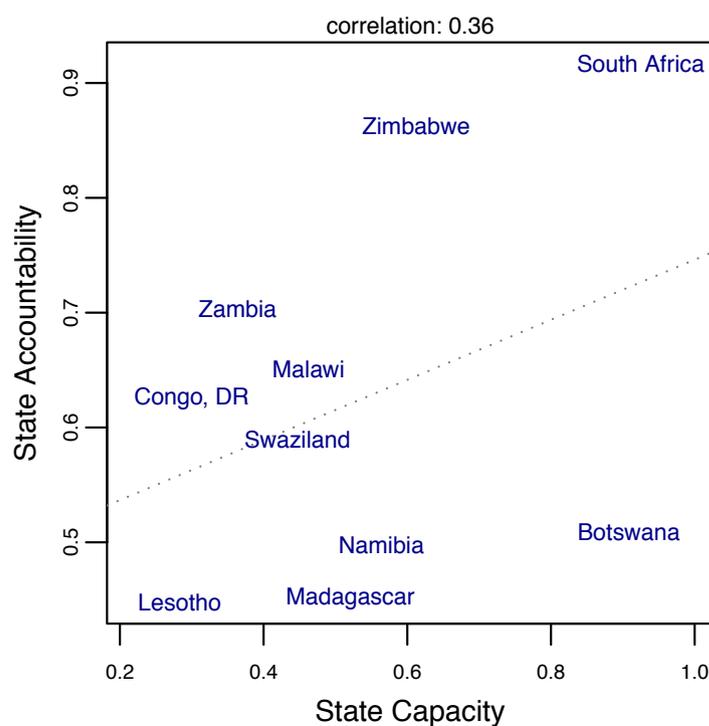
Figure 2: State Accountability (scores with confidence intervals)



The Relationship between State Capacity and State Accountability

The relationship between state capacity and accountability is shown in Figure 3, a scatter plot in which country labels are centred over their scores on the two indicators. South Africa ranks first in both dimensions, while Lesotho ranks last in both. Capacity and accountability are positively correlated – that is, countries with high scores for capacity also have higher scores for accountability, and vice versa. The correlation (reported at the top of the figure) is modest at 0.36 – on a scale where zero means no correlation at all and one means a perfect positive correlation. For several countries capacity and accountability differ substantially. Botswana’s capacity score exceeds its accountability score by a wide margin, while Zambia’s accountability score exceeds its capacity score by almost as much. Many different combinations of capacity and accountability appear in the scatter plot. We now turn from mineral governance in potential to mineral governance in action to see how these differences play out in practice.

Figure 3: Association between State Capacity and Accountability



Measuring Mineral Governance in Action

The adoption and implementation of regulatory frameworks across the four issue-areas informed by the Africa Mining Vision and the more detailed follow-up (2011) report by the United Nations Economic Commission for Africa's international study group on Africa's mining regimes represent mineral governance in action. At a collaborative project workshop, 38 rules within these issue-areas (listed in Box 3) were identified. For each item, in-country researchers asked three questions:

- Does a rule imposing requirements or restrictions on mining companies exist as of the end of 2015?
- If so, is there credible evidence that an official body has detected non-compliance by a mining company within the past five years?
- Where there is evidence of non-compliance is there proof that an official body has imposed penalties on a mining company within the past five years?

The answers to the first question, compiled across the 38 items, provide the basis for our estimate of the coverage of the country's regulatory framework. From the answers to the second and third questions, we estimated the degree of monitoring and enforcement.

In the rest of the section, we summarise the results across all four issue-areas. The regulation indicator captures the prevalence of rules in each country – the overall scope of a country's regulatory framework. The monitoring and enforcement captures the rates of official detection and penalties for non-compliance, with respect to the rules in place in each country. Finally, the regulatory presence indicator measures regulation, monitoring, and enforcement of all 38 rules. At each step, we examine the relationship between these indicators of mineral governance in action and state capacity and state accountability.

Regulation

The regulation indicator is the average prevalence of rules across the four issue-areas. Technically the clustering of items into sub-indicators gives them subtly different weights. Figure 4 presents the results. The average score is 0.63, meaning that nearly two-thirds of the 38 rules are in place in the ten countries. Eight of the 10 countries have at least half the rules in place. Swaziland and Namibia are the exceptions. Regulation scores are high for three countries with large and well-established mining sectors: Zambia leads with 82 percent prevalence, followed closely by South Africa and Botswana. Despite having smaller and newer mining sectors, countries like Lesotho, Madagascar, and Malawi have enacted more than half of the rules – perhaps reflecting the recent trend toward more elaborate mining codes in Africa. The three countries with the lowest scores on regulation – Botswana, Swaziland, and Namibia – have small populations, though Botswana and Namibia rank first and third of our 10 countries in mining income as a percentage of GDP. Namibia, with regulation prevalence of only 35 percent, has been considering reforms to its mining code but had not made any major changes by the end of 2015.

Box 3: Measuring Mining Regulation

The indicator of Regulation consists of the following 38 items across four issue-areas.

National Linkages (11 items)

- Do laws or regulations:
- Specify penalties for mining companies that fail to publish earnings data?
- Specify penalties for mining companies that fail to publish data on investment or extraction (production) costs?
- Specify penalties for mining companies that fail to publish data on subsidies received from the state?
- Specify penalties for mining companies that fail to pay taxes due?
- Require mining companies to retain a portion of profits earned within the country?
- Require mining companies to make a specific contribution to national infrastructure (e.g. transport, energy, water) OR to a dedicated national development fund (e.g. education, housing, social development)?
- Require mining companies to procure a portion of mining inputs (e.g. capital goods, consumables, services) from domestic suppliers?
- Require mining companies to process domestically a portion of the minerals they extract (“beneficiate”)?
- Require mining companies to create a minimum number of jobs OR to limit the employment of foreign nationals?
- Require mining companies to hire a portion of their technical staff domestically?
- Require mining companies to provide technical training for domestically hired technical staff?

Community Impact (13 items)

Do laws or regulations:

- Require mining companies to obtain the consent of local communities affected by mining development?
- Require mining companies to have regular, ongoing consultations with local communities affected by mining?
- Require mining companies to conduct social impact assessments before contracts are awarded or new projects are implemented?
- Require mining companies to conduct continuing social impact assessments after contracts are awarded or as projects are being implemented?
- Prevent mining companies from buying private land directly from its owners?
- Prevent mining companies from buying communal land directly from traditional leaders (or “chiefs”)?
- Regulate mining companies’ ability to use local water supplies?
- Restrict mining companies’ ability to displace local populations?
- Require mining companies to resettle displaced populations?
- Require mining companies to hire a portion of their workers or staff from the local community?

- Require mining companies to build or to make direct contributions to building public facilities for the use of local communities affected by mining OR to contribute financially to dedicated community funds?
- Specify mining companies' responsibilities for disaster management?
- Restrict mining companies' right to decide whether or when to close a mine?

Labour (9 items)

Do laws or regulations:

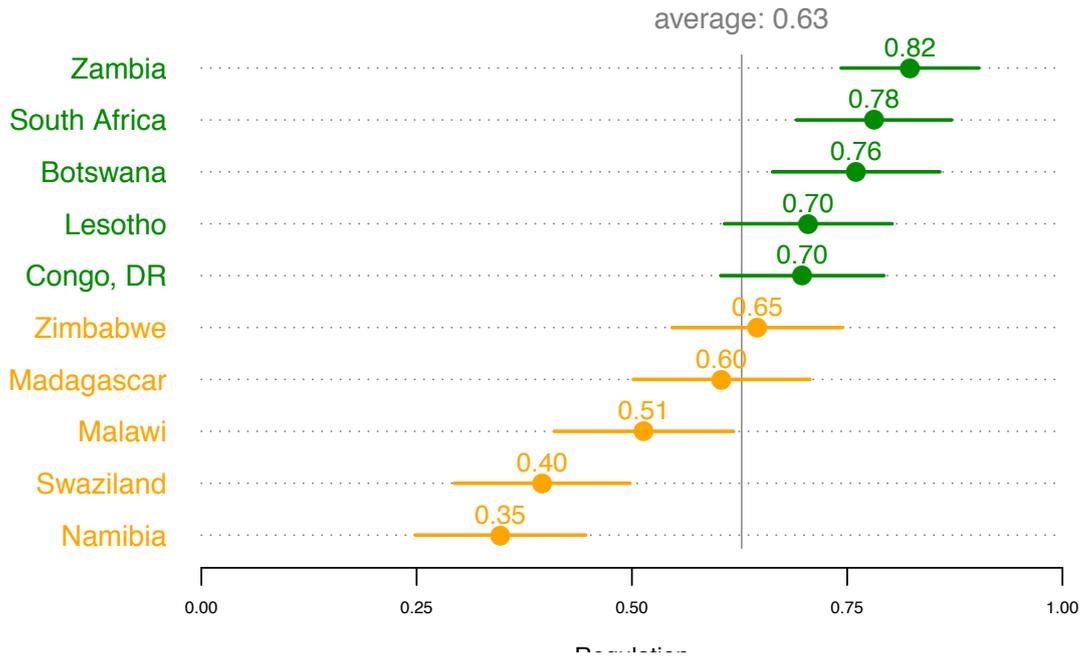
- Specify a minimum wage applicable to the mining sector?
- Require mining companies to get government permission to retrench workers?
- Require mining companies to meet standards of worker safety?
- Require mining companies to contribute to employee health care?
- Require mining companies to meet standards of gender equality in employment practices?
- Require mining companies to meet standards of gender equality in workplace practices?
- Ban mining companies from employing children?
- Specify when and how mining companies may discipline employees?
- Specify when and how mining companies may terminate individual employees?

Environment (5 items)

Do laws or regulations:

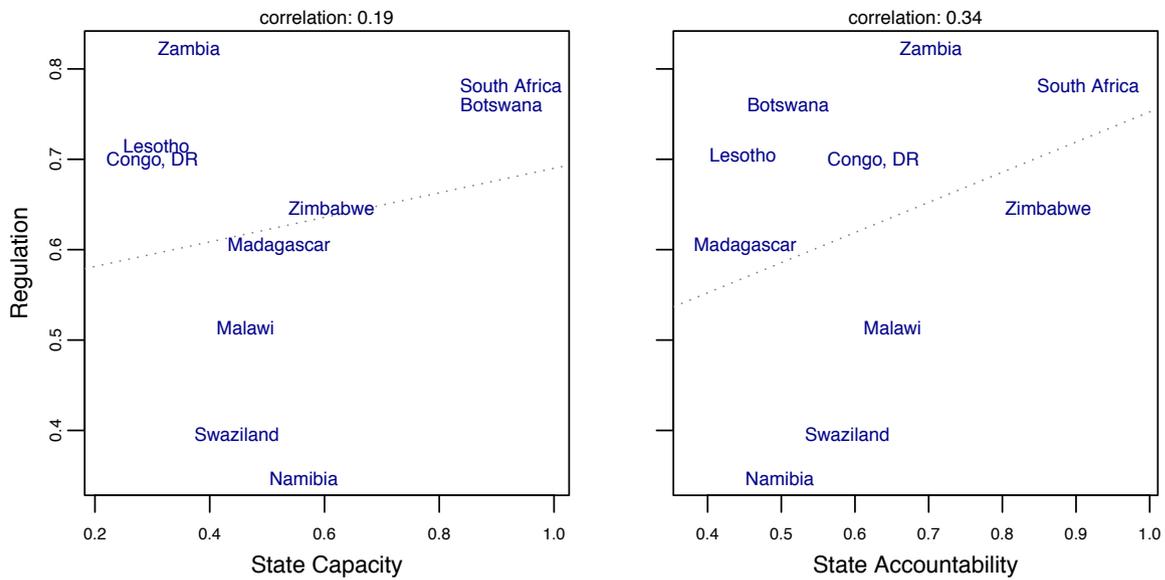
- Hold mining companies legally liable for local environmental damage?
- Limit the quantity of minerals that companies are permitted to extract in a given year?
- Require mining companies to conduct environmental impact assessments before contracts are awarded or new projects are initiated?
- Require mining companies to compile formal environmental management plans?
- Require mining companies to make financial contributions to dedicated environmental funds OR to make non-financial, offsetting contributions to environmental protection?

Figure 4: Regulation (scores with confidence intervals)



With only 10 countries in our scatter plots, we cannot assert any strong generalisations. Among these 10 countries, though, accountability in the mining sector seems to be linked more closely to the prevalence of regulations than capacity is.

Figure 5: Association of Regulation with Capacity and with Accountability



A substantive interpretation is that countries with robust accountability mechanisms and vibrant civil societies are more likely to regulate mining in ways that promote national economic and fiscal linkages, enhance community welfare, and protect workers and the environment. Robust accountability mechanisms allow trade unions, civil society organisations, and other non-state actors to play an active role in debating and exercising oversight of the mining sector. Countries with such mechanisms often end up with more elaborate sets of laws and regulations. Comparing Botswana and South Africa illustrates this. Both have high levels of state capacity, but South Africa has a much more robust set of accountability mechanisms than Botswana does. Seemingly, as a result it has a far more extensive regulatory framework. Many factors other than accountability mechanisms may contribute to the prevalence of mining regulations. Some causality may run in the other direction, with extensive regulations encouraging broader participation in legislative committees and other consultative and oversight bodies. But accountability and regulatory prevalence generally correlate in our 10 countries.

Monitoring and Enforcement

When a government imposes requirements or restrictions on mining companies, it imposes obligations on itself and the state apparatus to monitor companies' activities and to apply penalties where appropriate. No matter how well-crafted a country's regulatory framework for mining is, without effective monitoring and enforcement it is just a set of documents on a shelf. Our indicator of monitoring and enforcement focuses only on the specific rules (of the 38 in Box 3) that a country has adopted – since the state can only monitor and enforce rules that are official. Monitoring is of the proportion of the 38 rules where an official body detected non-compliance by a mining company in the five years up until the end of 2015. Enforcement relates to the proportion of the rules against which an official body imposed penalties on a mining company found to be non-compliant in the same period. The monitoring and enforcement indicator gives the average of the two proportions: detecting non-compliance and punishing non-compliance, as shown in Box 4.

Box 4: Measuring Monitoring/Enforcement and Regulatory Presence

Monitoring and Enforcement

The indicator of Monitoring and Enforcement is based on items regarding the detection and punishment of mining company non-compliance for those laws and regulations (of the 38 listed in Box 3) that a country has in place:

- Publicly available evidence (court records, government findings, filed grievances) of official state detection of mining companies' non-compliance with regard to each of the laws or regulations (a "conditional" average across only those laws and regulation in place in the country);
- Evidence that the state has imposed penalties (e.g. remedial action, fines, license revoked/denied, criminal prosecution) on mining companies where non-compliance has been detected (a "conditional" average across only those laws and regulations in place in each country)

(The indicator of Monitoring and Enforcement is based on "conditional" averages to capture how well a country monitors and enforces the laws and regulations actually in place.)

Regulatory Presence

The indicator of Regulatory Presence combines an average of the Regulation and a modified version of the indicator of Monitoring and Enforcement for all the laws and regulations (of the 38 listed in Box 3), whether or not they are in place.

It is an equally weighted average of:

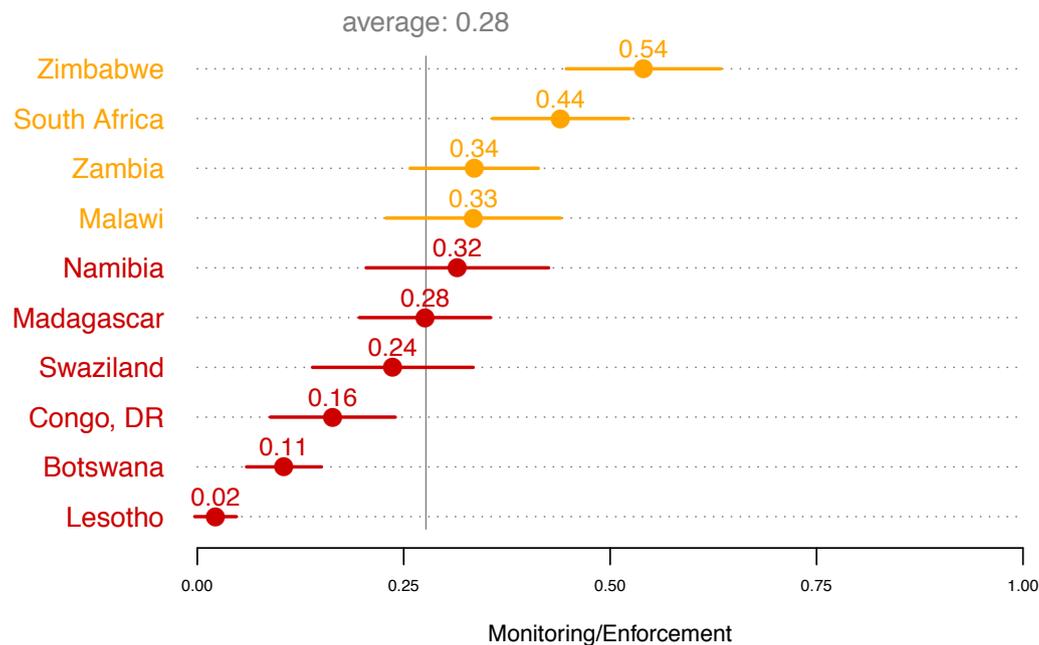
- The indicator of Regulation described in Box 3; and
- A modified indicator of Monitoring and Enforcement (based on "unconditional" averages of detection and punishment of company non-compliance across all 38 laws and regulations in Box 3).

(The modified indicator of Monitoring and Enforcement used in calculating Regulatory Presence avoids "rewarding" countries with fewer laws and regulations in place with higher scores.)

Since monitoring and enforcement are based on observable detection and penalties, countries with more cases of company non-compliance receive more attention. A country like South Africa with more than 100 active mining companies is likely to see more non-compliance than a country like Swaziland that has only a handful of mining companies. Moreover, states that excel at detecting and penalising non-compliance may deter non-compliance. In the extreme, non-compliance could be deterred entirely, leaving no opportunities for the state to impose penalties. Paradoxically, perfect monitoring and enforcement could result in zero observed detections and penalties. Conversely, many observed detections and penalties could be symptomatic of erratic or arbitrary enforcement that encourages non-compliance. In the countries in our study, effective monitoring and enforcement can generally be expected to result in at least some observable detection and penalties, but this need not always be true.

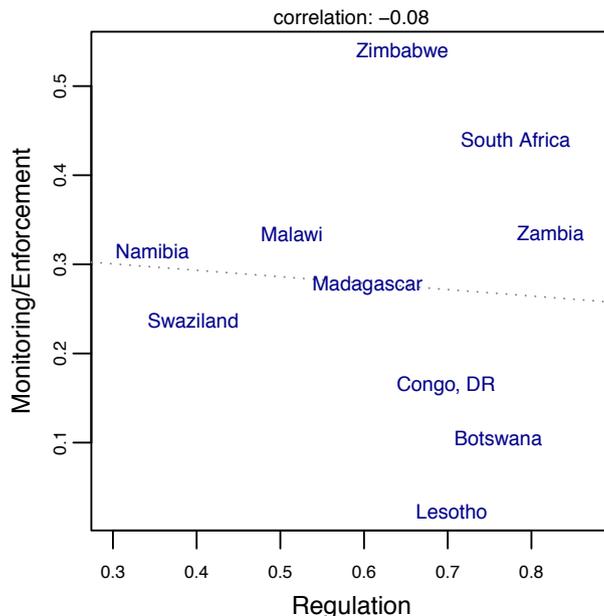
Figure 6 shows the scores for monitoring and enforcement. It is immediately obvious that monitoring and enforcement scores are much lower than those for regulation, averaging only 0.28. Compared with the eight of 10 countries that scored above the midpoint (0.50) on regulations, only Zimbabwe meets that standard for monitoring and enforcement, although we set the bar low: a state needs to detect or punish non-compliance with a rule only once in five years to get the highest score. Low monitoring and enforcement scores signal that a state is more successful at imposing rules and restrictions on mining companies than meeting its obligations to implement them. Lesotho and Botswana have the lowest scores. A possible explanation is that diamond companies run as public-private partnerships dominate both countries' mining industries. Some state oversight may be exercised within the companies involved. The DRC has a low score, and though it has a large, state-owned mining company (Gécamines), its mining industry is less concentrated than those of Lesotho and Botswana.

Figure 6: Monitoring/Enforcement (scores with confidence intervals)



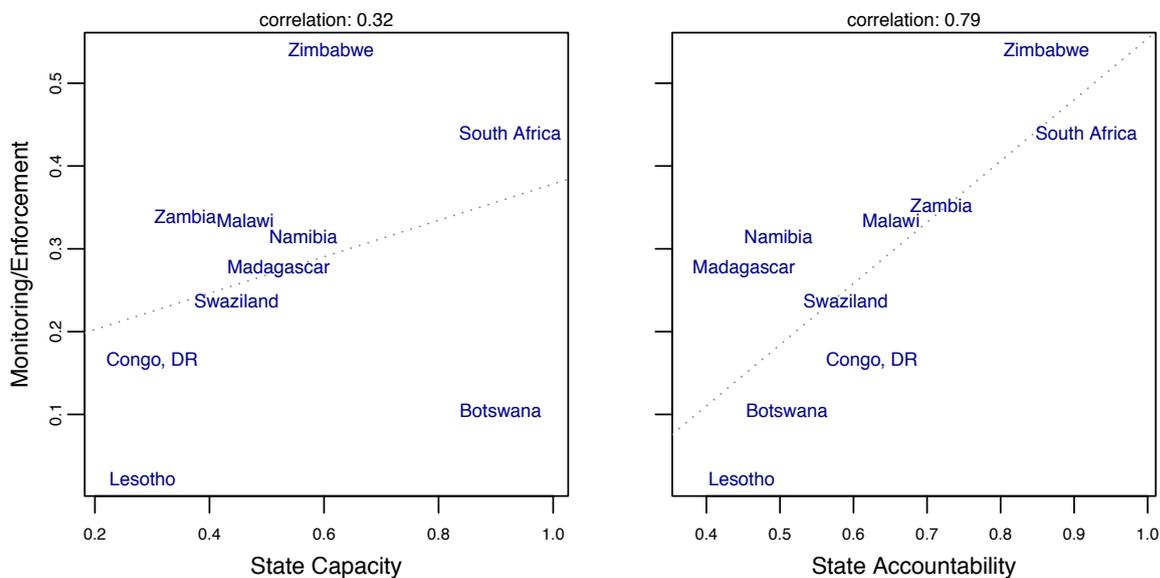
Active implementation of mining regulations turns out to have little to do with the prevalence of a state's regulations. Figure 7 shows the association between regulation, on one hand, and monitoring and enforcement, on the other. The line slopes slightly downward, as the corresponding correlation is negative (-0.08). The slope and the correlation are not far from zero. It is evident that there is little or no correlation between the number of regulations a state has and the monitoring and enforcement of compliance. The right side of the graph, which depicts the countries with the most complete regulatory frameworks, illustrates this point. Some countries, like Zimbabwe and South Africa, have the highest monitoring and enforcement scores. Others, like Lesotho and Botswana, have the lowest scores. The four countries with the least rules – Namibia, Swaziland, Malawi, and Madagascar – are comparatively effective in monitoring and enforcing compliance, with detection and punishment rates between a quarter and a third.

Figure 7: Association between Regulation and Monitoring/Enforcement



Returning to our hypotheses about the relationship between mineral governance in potential and mineral governance in action, now with respect to the implementation of rules, the patterns in Figure 8 indicate that state capacity and accountability do contribute to better monitoring and enforcement. The lines in both panels slope upward, showing positive correlations. The pattern is sharper for accountability than it is for capacity. Monitoring and enforcement is more sensitive to accountability mechanisms and an active civil society and citizenry than it is to state capacity. The correlations in Figure 8 are almost twice as strong as the analogous

Figure 8: Association of Monitoring/Enforcement with Capacity and with Accountability



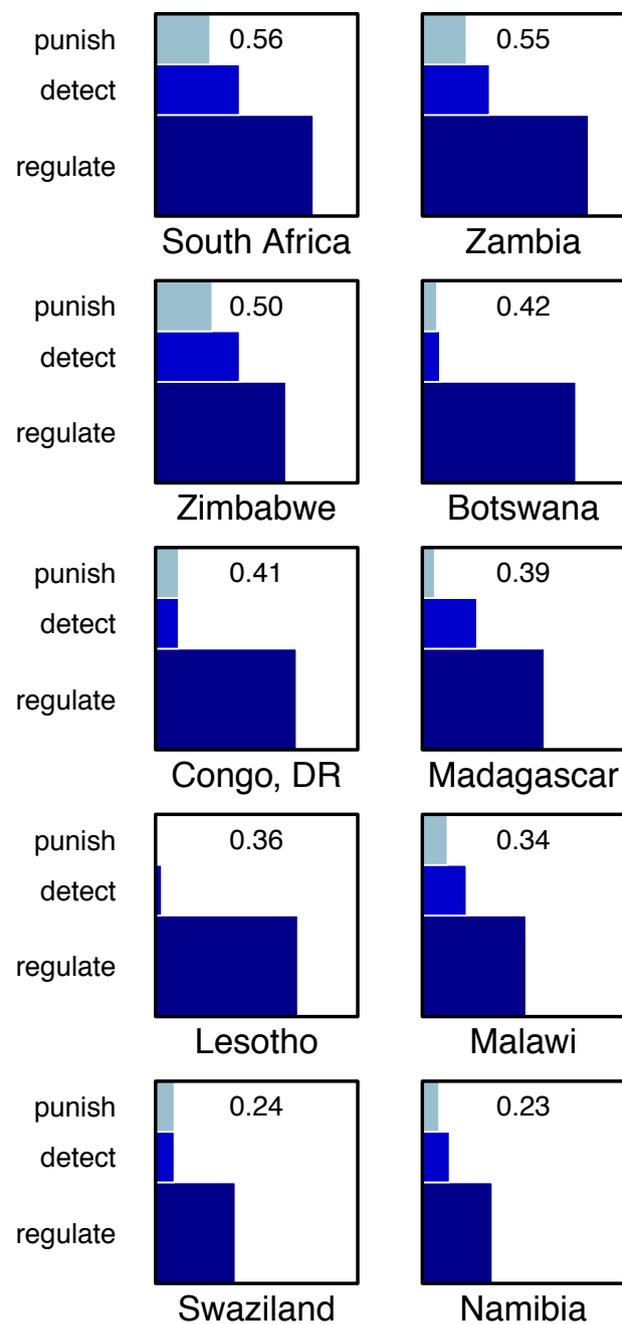
correlations with regulation in Figure 5. Accountability seems to be especially important in pressurising the state to monitor and enforce its own regulations.

Regulatory Presence

Regulatory presence is a concept that combines the prevalence of regulation with overall detection and punishment of non-compliance. It is the average of the regulation score and a revised monitoring and enforcement score, with the detection and punishment of non-compliance by mining companies calculated as a proportion of all 38 rules. It differs from the original monitoring and enforcement score, which was the proportion of only those rules a country actually has in place. The rationale for the difference is to avoid indirectly favouring countries with few regulations in an indicator of regulatory presence.

Figure 9 illustrates the construction of the indicator, with countries ordered according to their scores. The bottom half of each box is for regulations, and the horizontal bar represents the proportion of a country’s regulations. South Africa and Zambia, for example, have about 80 percent of the possible rules (as shown in Figure 4) and so the horizontal bar fills about 80 percent of the bottom half of the box. The top half of each box is divided between detected non-compliance and punished non-compliance. The bars are stacked because it is impossible to detect non-compliance without first regulating, and it is impossible to punish non-compliance without first detecting it. The regulatory presence score is the proportion of the box filled by the bars. The more a country regulates, detects, and punishes, the higher its score. However, different patterns can give rise to similar

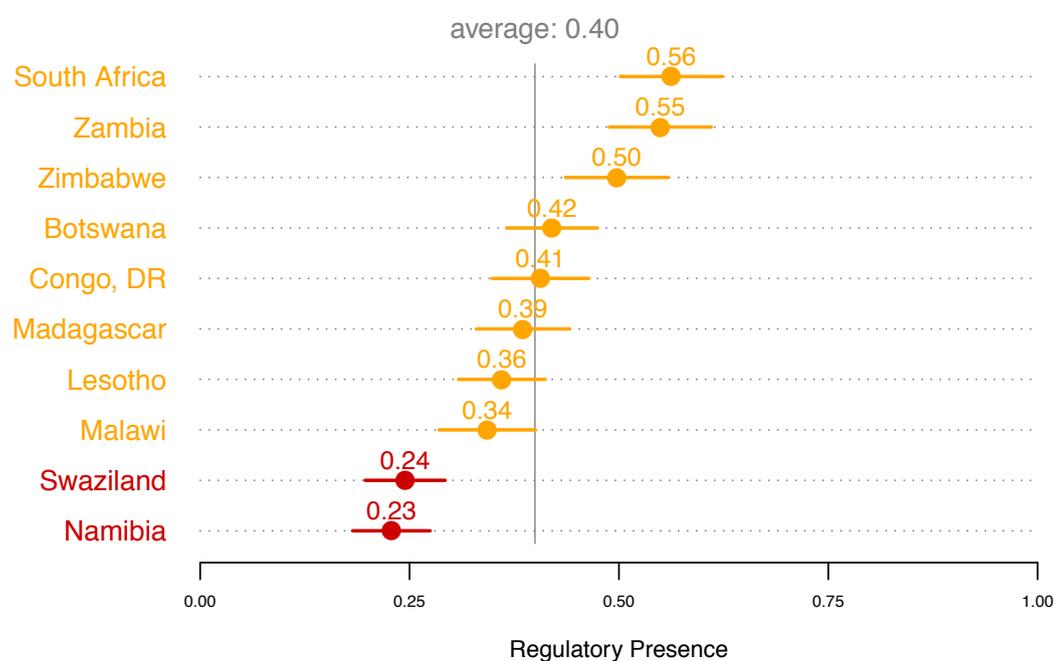
Figure 9: Regulatory Presence (scores from components)



scores. Lesotho’s score is almost identical to Malawi’s, for example, but Lesotho’s in the case of Lesotho this is almost entirely due to regulations, while Malawi regulates less but detects and punishes more.

Regulatory presence gives a summary of mineral governance in action by combining the prevalence of regulations and the extent of state detection and punishment of non-compliance. Figure 10 shows the scores (with confidence intervals). The scores can never exceed the regulation scores in Figure 4, because achieving the same score for regulatory presence as for regulation would require detecting and punishing non-compliance for every rule. Figure 10 shows that that is far from the truth, with an average score of 0.40. South Africa, Zambia, and Zimbabwe are the only countries to achieve at least 50 percent. Five other countries are clustered below half and above one third – Botswana, DRC, Madagascar, Lesotho, and Malawi. Meanwhile, the bottom two include the countries with the smallest mining industry in dollar terms in the 10-country sample, Swaziland, and the country with the fifth largest industry, Namibia. Namibia’s low score is anomalous, reflecting its unusually sparse regulatory framework.

Figure 10: Regulatory Presence (scores with confidence intervals)

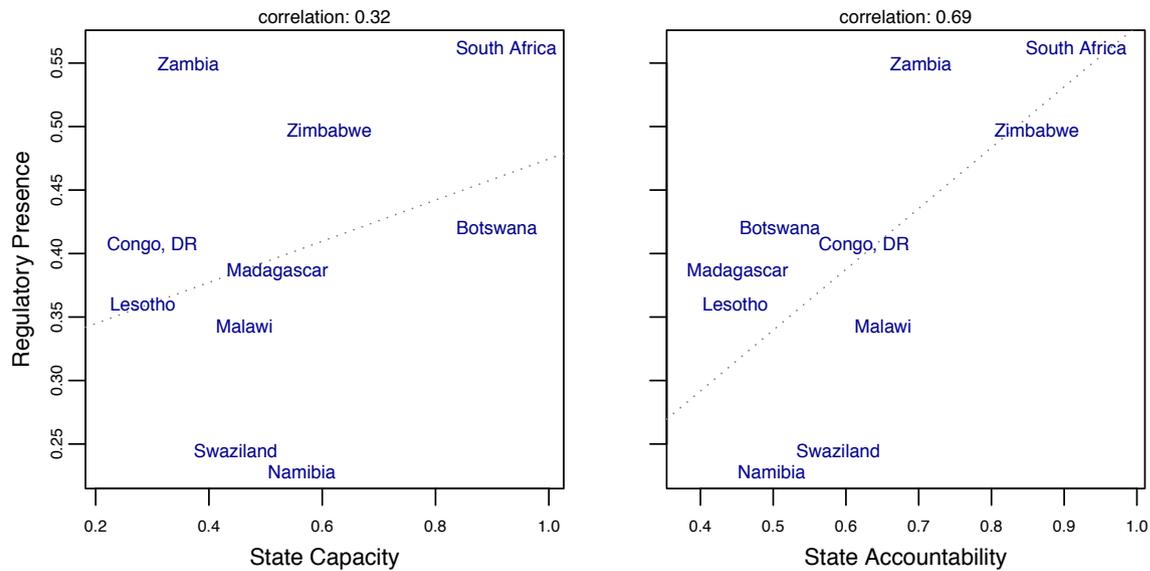


The Relationship between Mineral Governance in Potential and Mineral Governance in Action

Regulatory presence is the most encompassing indicator of mineral governance in action. In this section we examine its association with our indicators of mineral governance in potential. Figure 11 repeats the now familiar pattern: Regulatory presence is positively associated with both indicators, and it is more closely associated with accountability (correlation of 0.69) than with capacity (correlation of 0.32).

Mineral governance in action in our 10 Southern African countries falls markedly short of the ideal. Many features of the regulatory framework outlined in documents such as the Africa Mining Vision are missing. More importantly, implementation is weak. However, scores on indicators of regulations, monitoring, and enforcement vary considerably among countries. Accountability in the mining sector appears to be more crucial than capacity in influencing a country’s record for developing regulations and implementing them. Yet, since only 10 countries are included in the study, these patterns are suggestive but far from statistically definitive.

Figure 11: Association of Regulatory Presence with Capacity and with Accountability



Unpacking Mineral Governance by Issue-Area

In this section the four issue-areas are described in more detail and the additional issue area, ASM, is analysed.

The Issue-Areas

National Economic and Fiscal Linkages

If the extraction of non-renewable mineral resources is to contribute to sustainable economic development, rents from mineral extraction must be used to stimulate economic activity in other sectors. Rents are the unearned benefits of mining; the profits earned above the costs of extraction and a normal return to capital. The three main options for harnessing rents for broader development are:

- Stimulating upstream (or backward) economic linkages by procuring inputs to mining, including labour, domestically;
- Downstream (or forward) economic linkages by processing mineral output domestically, and
- Fiscal linkages by taxing rents and using them to promote economic development (Barma et. al 2012; Lewis 1989).

The indicator of linkages is based on 11 items listed in Box 3, clustered into six sub-indicators. These sub-indicators relate to data provision, taxes and profit retention, contribution to development funds and infrastructure, beneficiation and local procurement of inputs, job creation, and technical skills transfer.

Community Impact

Even if mineral extraction contributes to the national economy, local communities affected by mining may not benefit and they may be harmed. The mining industry poses risks and challenges more acutely than other industries. For example, mining typically makes heavy demands on local livelihood resources such as land and water and the physical location of mineral resources may lead to the displacement of communities. While mining can create local economic opportunities, it also makes communities more vulnerable to mining accidents and disasters and in the longer term to mine closure.

The indicator of community impact is based on 13 items listed in Box 3, clustered into six sub-indicators. These sub-indicators relate to consulting with and getting consent from local communities, conducting social impact assessments, using local land and water resources, displacing and resettling local communities and providing employment opportunities, providing infrastructure, and providing social protection in the face of accidents and mine closure.

Labour

Mineral extraction raises labour issues that are common to all industrial employment, and others - particularly related to health and safety - that are more acute in the mining industry.

The labour indicator is based on nine items listed in Box 3, clustered into four sub-indicators:

- Wages and large-scale retrenchment;
- Health and safety in the workplace;
- Gender equity and children's rights;
- A mining company's discretion to discipline individual workers or terminate their employment.

Environment

Mineral extraction by definition involves the depletion of non-renewable subsoil assets, and the process of mining carries other environmental costs. The notion of "green accounting" is based on the premise that an assessment of mining and development must tally the benefits against the costs in terms of resource depletion and environmental damage (World Bank 2011).

The environment indicator is based on six items listed in Box 3, clustered into four sub-indicators:

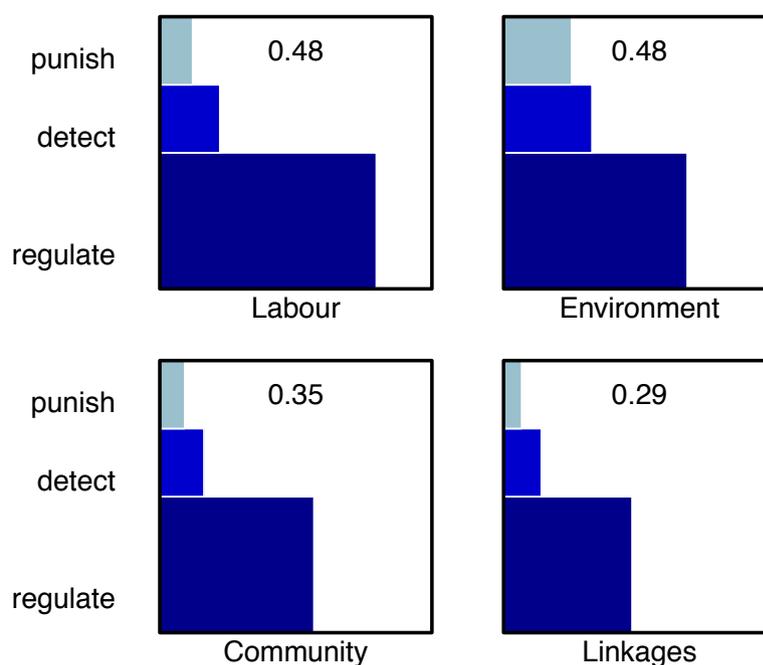
- Legal liability for environmental damage caused;
- Whether or not a mining company is subject to limits on the quantity of resources they may extract;
- A mining company's responsibilities regarding environmental impact assessments and environmental assessment plans;
- Requirements in relation to environmental protection.

Mineral Governance by Issue-Area

How does mineral governance differ across the four issue-areas? Countries can vary markedly, but it is useful to analyse whether, on average, some issue-areas have substantially more regulation or regulatory presence than others.

Figure 12 depicts the component breakdown of regulatory presence by issue-area, averaged over the 10 Southern African countries. Labour (0.48) and environment (0.48) outperform community (0.35) and linkages (0.29). The ranking on regulation alone is the same, although the scores are higher, given imperfect implementation. The scores, upon which the “regulate” bars are based, are 0.80 for labour, 0.68 for environment, 0.57 for community, and 0.47 for linkages.

Figure 12: Regulatory Presence by Issue-Area (scores from components)



A possible interpretation is that labour and environment regulations apply by default throughout the economy, while regulations regarding community impact and national linkages are more specific to mineral extraction. A complementary interpretation is that civil society may be better organised around labour and environmental issues, while the affected constituencies in the other-issue areas are more geographically isolated (community impact) or sectorally fragmented (national linkages). Community impact and national linkages have become more important priorities in mineral governance, for example in the Africa Mining Vision, but the mining codes of the different countries have changed to reflect this.

Breaking down the regulatory framework of each country by issue-area gives a more textured perspective. Figure 13 depicts regulation within each issue-area for each country. Countries are listed from top to bottom according to their overall regulation scores. Confidence intervals are

omitted because the number of items is much smaller within issue-areas. In the upper panels, for labour and environment, most scores are in the top third of the scale (coloured green), while the rest are in the middle third (coloured amber). In the lower panels, many more scores are in the amber zone, with some even in the bottom third, coloured red.

More cross-national variation exists in community and linkages. In linkages industrialised countries have higher scores, possibly reflecting the influence of established economic interests in mineral processing and procurement. In community, Madagascar emerges as a surprise leader with 92 percent of the rules in place. This reflects a particular concern about regulating the expansion of mining in populated areas.

Figure 13: Regulation by Country and Issue-Area

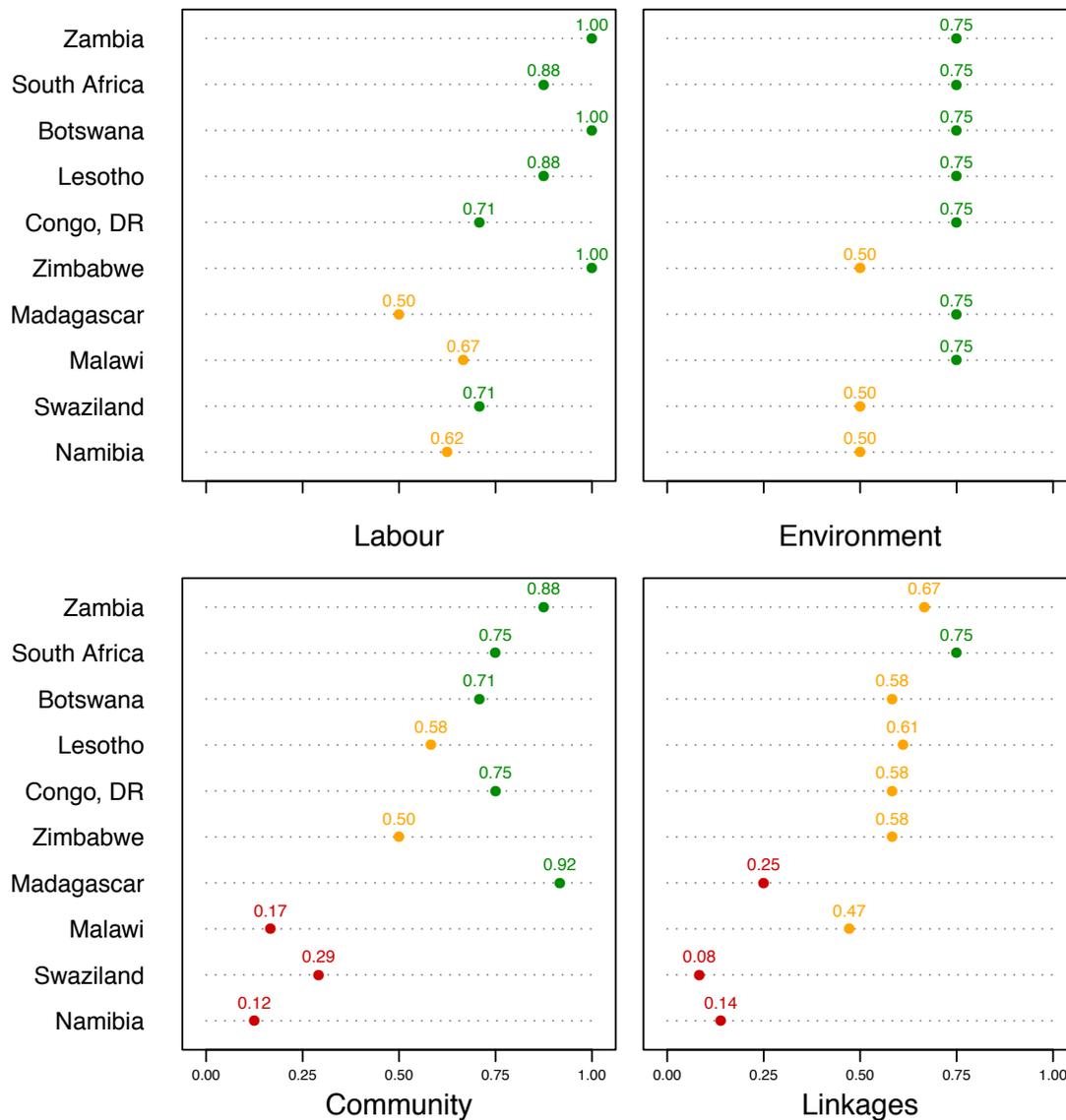
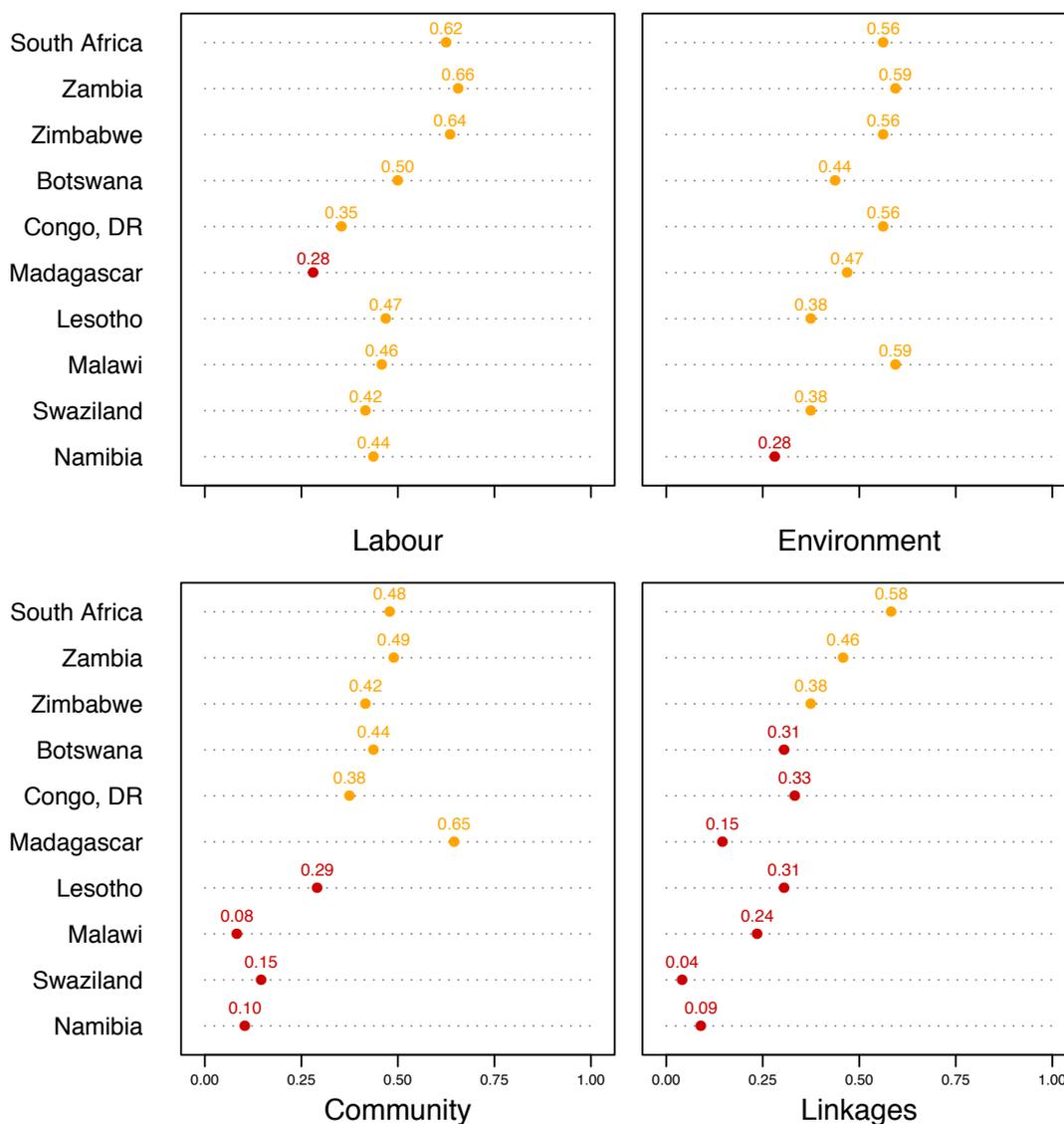


Figure 14 depicts the cross-national breakdown of regulatory presence by country. An obvious difference from regulation is that no green scores are achieved in any of the four panels. This is due to highly imperfect monitoring and enforcement. The pattern of regulatory presence is otherwise similar to that for regulation alone. The many red scores in community and linkages, particularly near the bottom of those panels, highlights the lack of effective regulation regarding local social impact and enclave tendencies in mining.

Figure 14: Regulatory Presence by Country and Issue-Area



Artisanal and Small-Scale Mining (ASM): An Additional Issue-Area

ASM is a special theme in the Africa Mining Vision. Artisanal mining can refer to mining carried out using practices and tools that preceded and coexist with large-scale, capital-intensive mining. The broader ASM category can refer to a wide range of activities, including surface mining using mechanised earth-moving equipment, typically with a permit. Artisanal mining is a particular concern because it is directly relevant to local livelihoods, sometimes for the better and sometimes for the worse. It can contribute, and has contributed, to the livelihoods of communities located near mineral deposits. Yet because artisanal mining is often poorly regulated, unregulated, or illegal, its benefits come with social, economic, and environmental risks. An appropriate and effective regulatory framework for the ASM sector is the goal.

Since ASM does not directly involve the large-scale mining companies that are active in other issue-areas, the focus of the study was on determining the extent to which rules are in place to govern ASM, as shown in Box 5. We asked whether laws or official regulations distinguish between ASM and large-scale mining and, if so, if licenses or permits are required for ASM. We investigated whether ASM is restricted to specific geographical areas or mineral commodities. We also investigated whether ASM is subject to health and safety regulations and whether child labour is banned. Finally, we checked whether any laws or regulations encourage integrating ASM with larger-scale mining, called for in the Africa Mining Vision.

Box 5: Measuring Regulation of Artisanal and Small Scale Mining

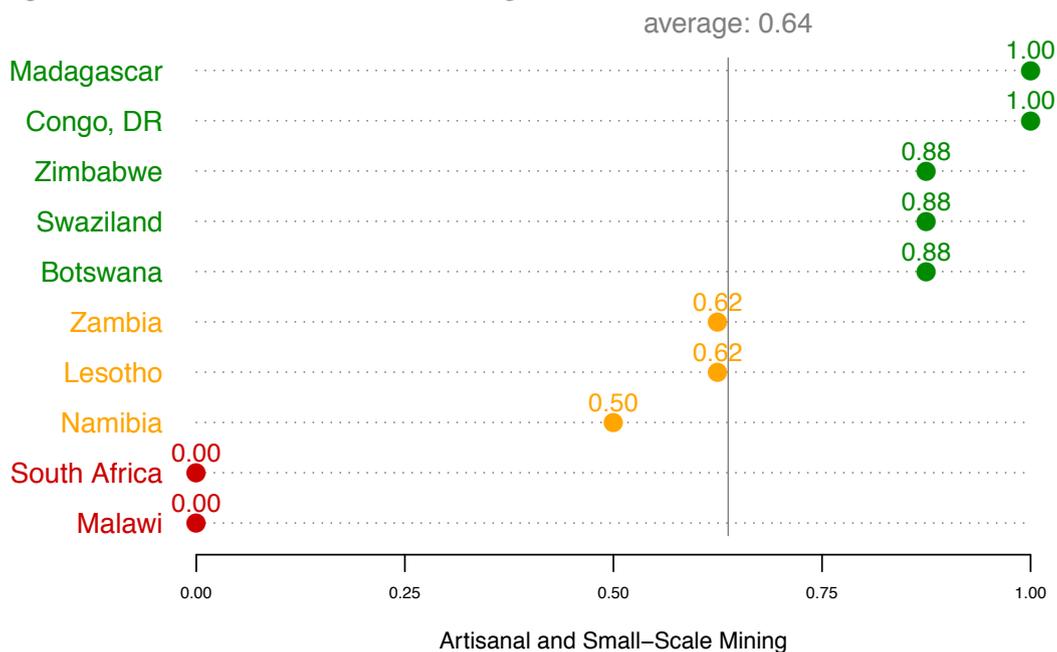
The indicator of ASM Regulation consists of the following 8 individual indicators.

Do laws or regulations:

- Explicitly distinguish between artisanal and small scale mining and larger scale mining?
- Specify geographic areas or zones where ASM is or is not permitted?
- Specify which minerals can or cannot be extracted through ASM?
- Ban the use of child labour in ASM?
- Set out specific requirements or regulations that affect the safety of those mining in the ASM sector?
- Set out specific requirements or regulations that affect the health conditions of those mining in the ASM sector?
- Require licenses or permits for those mining in the ASM sector?
- Encourage greater integration of ASM with the formal and larger scale mining sector?

Figure 15 depicts the results reflecting that the ASM regulations in the 10 countries range from comprehensive to non-existent. Madagascar and the DRC possess all eight of the items that we looked for, giving them perfect scores. They are also the two countries with by far the largest recorded ASM sectors in Southern Africa (see Yager 2016; 2014). At the other end of the spectrum Malawi and South Africa lack policies on ASM. South Africa essentially treats artisanal mining as illegal mining, and in recent years has experienced several disasters in which illegal miners have been trapped in disused mining shafts.

Figure 15: Artisanal and Small-Scale Mining (ASM)



An Aggregate Indicator of Mineral Governance

A central aim of the study has been to develop a basis for comparing mineral governance in Southern African countries. The indicators presented probe several dimensions – from state capacity and accountability to the prevalence of regulations across several issue-areas and the degree of observable monitoring and enforcement. Countries that score well on some indicators occasionally score poorly on others, but for the most part key indicators correlate positively with each other. An indicator that aggregates the major indicators of mineral governance can summarise overall patterns. In this section we construct such an indicator and then use quantitative analysis and qualitative insights to explore what it can and cannot tell us about mineral governance in Southern Africa.

The aggregate indicator is informed by the distinction between mineral governance in potential and mineral governance in action. These two major components are given equal weight in calculating the aggregate. Mineral governance in potential includes state capacity and state accountability, while mineral governance in action includes regulation and monitoring/enforcement. The aggregate indicator is the simple average of four components: State capacity, state accountability, regulation, and monitoring/enforcement.

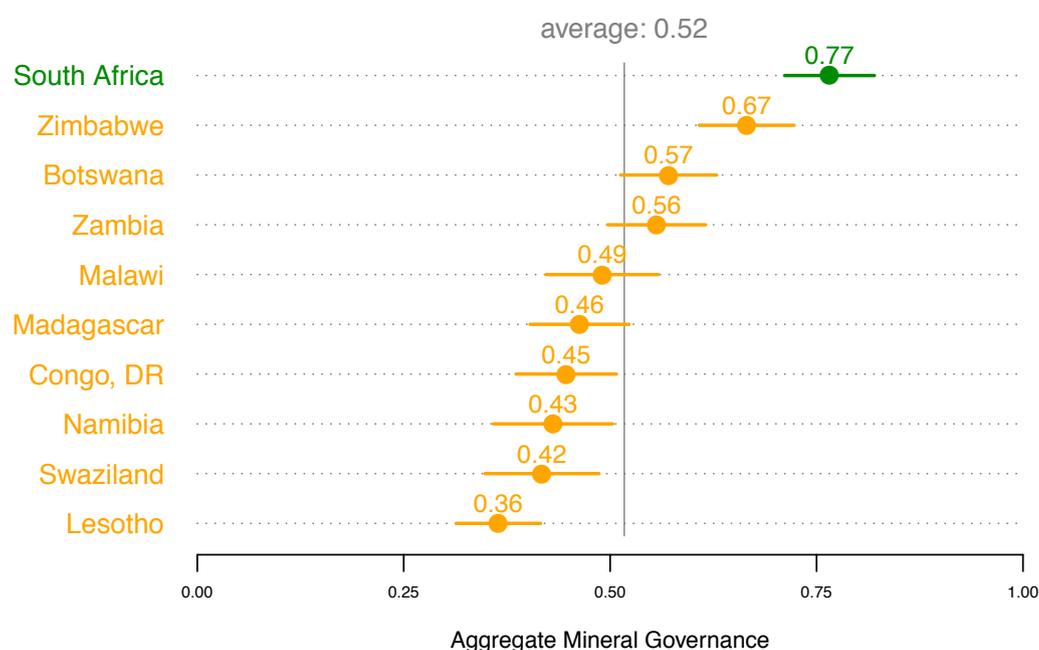
Table 2 depicts correlations between the aggregate and its components. Every correlation is positive. The positive correlations emerge because scores on the component indicators generally go together, with some countries getting higher scores across the board, and others getting lower scores across the board. The positive correlations are inflated because each component is mathematically contained in the aggregate. The component most closely correlated with the aggregate is accountability (0.85). This means that the distribution of a country's aggregate scores closely mirrors the distribution of its accountability scores. This in turn means that accountability captures features of mineral governance that are closely associated with the other components. The component most weakly correlated with the aggregate is regulation (0.50), which means that the prevalence of regulations is not aligned to overall mineral governance to the extent that the other three components are.

Table 2: Correlations between the Aggregate Indicator and its Components

	Aggregate
Capacity	0.74
Accountability	0.85
Regulation	0.50
Monitoring/Enforcement	0.69

The aggregate score and its confidence interval are depicted for each country in Figure 16. The 10-country average of 0.52 highlights the fact that there is ample room for improving mineral governance in Southern Africa since approximately half of the attributes and actions we looked for were in place at the end of 2015. The four countries with scores that exceed the average are all major mining economies: South Africa, Zimbabwe, Botswana, and Zambia. The countries with the two lowest scores have small mining industries: Lesotho and Swaziland. They do not lag far behind a number of countries with similar scores and overlapping confidence intervals: Malawi, Madagascar, the DRC, and Namibia.

Figure 16: Aggregate Mineral Governance (scores with confidence intervals)



A single numerical score only partially represents the challenges of mineral governance that a country faces. Box 6 contains comments from the in-country researchers, with countries listed from the highest to the lowest aggregate scores.

Some common themes emerge from these qualitative impressions of mineral governance.

Box 6: Insights from In-Country Researchers (countries ordered by Aggregate score)

South Africa (Wole Olaleye)

“Seemingly confrontational relations between the state and mining companies in South Africa reflect the government’s efforts to show the public that it takes the transformation of the mining industry seriously. Yet many citizens see this transformation as expanding the stake of black elites at the expense of vulnerable mining communities.”

Zimbabwe (Patience Mutopo)

“Zimbabwe scores highly on mineral governance, but the broader political and economic context could undermine these successes. Also, many citizens believe that the Mines and Minerals Act gives too much power to foreign-based mining companies, as it is colonial-era legislation. The mining sector faces major challenges despite past gains.”

Botswana (Nancy Kgengwenyane)

“The fact that Botswana’s has few examples of officially detected non-compliance and penalties imposed regarding mining regulations may be because diamonds form the backbone of the country’s economy, and therefore mining companies operate and act at high levels of due diligence and compliance.”

Zambia (Edward Lange)

“Since the privatization reforms in Zambia, many government officials do business with mining companies, and government decisions about the sector are often driven by the mining houses. The state’s technical capacity is also weak – for example it does not have clear estimates of mineral reserves – and this weakness is exploited by mining companies in negotiations with government.”

Malawi (Rachel Etter-Phoya)

“Malawi has few comprehensive rules about community impact and benefits or economic linkages. But mining governance is improving. The anticipated new Mines and Minerals Bill will hopefully usher in a new approach as the sector grows – ensuring that communities have a greater say about their future, and that mining is better integrated into the development of the national economy.”

Madagascar (Tim Healy)

“Although there are few large-scale mining operations in Madagascar, artisanal and small-scale mining (ASM) activities are vast and scattered throughout country – estimated to involve up to one million individuals. Since the 1990s the country has adopted mining and environmental instruments that address ASM and communities near mines, but there has been very little effective implementation.”

Congo, DR (Arthur Kaniki)

“The DRC has progressive mining legislation in place. The high level of non-compliance by mining companies reflects the state’s lack of capacity to monitor and enforce its own policies, as well as the prevalence of corruption among officials responsible for detecting and sanctioning non-compliance.”

Namibia (Maximillian Weylandt)

“Namibia’s lack of mining regulations can be traced to the fact that major legislation is up to two decades old. The country has not kept up with international expectations, especially on transparency in the extractive sector. A new Minerals Act has been in the works for years, but it is unclear when it will be tabled. The planned introduction of an Access to Information law next year could improve transparency in the sector.”

Swaziland (Sabelo Gumedze)

“Swaziland has no great mineral wealth, and what it has is not equitably distributed. Owing to a weak political and economic system, mineral governance remains weak. Prospects for mining expansion exist, but mining deals are shrouded in secrecy – not ideal for mineral governance.”

Lesotho (Lehlohonolo Chefa)

“There are two major challenges of mining governance in Lesotho – corruption and weak institutions. The two are linked because when institutions are weak, ineffective, and under-resourced it makes it easy for rent-seekers to exchange bribes for mining rights.”

Comments on South Africa and Zimbabwe, the two top-ranked countries, highlight tensions between the state and mining companies. This contrasts with the comment on Botswana, the country in third place. A history of settler and colonial rule in South Africa and Zimbabwe has fed public perceptions that mining benefits a white and/or foreign elite, rather than contributing to more inclusive patterns of economic development. The large mining industries and well-established institutions in these countries goes a long way in explaining their high scores. However, tensions between the state and mining companies may motivate more aggressive monitoring and enforcement of existing regulations and this could paradoxically raise numerical scores. The comment on Botswana paints a picture of greater cooperation with high levels of compliance by mining companies. Greater compliance means fewer opportunities to detect and punish violations of mining regulations, which would paradoxically lower Botswana’s numerical score.

Comments on Zambia, the DRC, and Namibia – countries with substantial mining industries that score less well – highlight different shortcomings that can undermine mineral governance. The contrast is sharpest between the DRC and Namibia. The comment on DRC indicates that the country has progressive mining regulations but weak monitoring and enforcement. The comment on Namibia indicates that the country has limited mining regulations and that these have barely been modified for decades. However, the component scores showed that Namibia does monitor and enforce the regulations it does have. The DRC and Namibia have similar aggregate scores but their strengths and weaknesses are identical. Zambia illustrates yet another pattern: it is near the top on regulatory presence but near the bottom on state capacity, apparently due to the partial capture of the state by mining companies following privatisation reforms.

Comments on Madagascar and Malawi – countries with small, emerging mining industries – highlight differences in community impact and ASM. Madagascar’s score is high with respect to these two areas, while Malawi’s scores is low. The comment on Madagascar emphasises the unusual prominence of ASM and a related concern with the potential impact of large-scale

mining on local communities. The comment on Malawi implies that the lack of attention to community impact is partly due to the smallness of the sector. Differences in regulation between the countries may exaggerate differences in mineral governance as the countries have similar aggregate scores. The comment on Madagascar points to implementation problems, while the comment on Malawi anticipates improvements in regulations.

Comments on Swaziland and Lesotho, countries with small mining industries and the lowest aggregate scores, highlight problems related to lack of transparency and corruption (also mentioned in the comment on the DRC). These are reminders that even in countries with limited state capacity, challenges of mineral governance are not simply to do with technical expertise and administrative effectiveness. Without institutions to hold state officials and mining companies accountable, mineral governance can be undermined by rent-seeking in the public and private sectors.

This section has summarised the indicators of mineral governance in a single aggregate. The statistical correlations between the aggregate and its components clarified important patterns in the data, while the comments from in-country researchers added qualitative insight. In the concluding section, we draw together lessons about mineral governance and about measuring mineral governance in Southern Africa.

Conclusion

The Mineral Governance Barometer is a pilot study that has developed empirical indicators of mineral governance in 10 Southern African countries. Despite increasing attention being given to the importance of mineral governance in the region, many studies have focused on the details of particular countries or issues, while the coverage of Southern Africa in larger cross-national data sets has been patchy. The lack of systematically compiled indicators has hindered the comparative assessment of mineral governance across countries and issue-areas.

The study has conceptualised mineral governance as governance in potential, in particular the presence of a capable and accountable state, and governance in action, the patterns of regulation, monitoring, and enforcement undertaken by the state. While our approach is informed by the issue-areas highlighted in documents such as the Africa Mining Vision, we see mineral governance as more than adopting a regulatory blueprint.

Regulations in the mining sector typically impose requirements and restrictions on mining companies. Consensus has emerged within the region and beyond that such regulations are necessary if mining is to contribute to inclusive and sustainable development.

We have further emphasised that when a state imposes requirements and restrictions on mining companies, it simultaneously imposes direct obligations on itself and indirect obligations on citizens and civil society. The direct obligations are to monitor the compliance of mining companies and to impose penalties when non-compliance is identified. The indirect obligations on citizens and civil society are to hold the state and mining companies accountable in fulfilling their obligations under law. The conception of mineral governance as a set of linked obligations upon mining companies, the state, and ultimately citizens and civil society is a running theme in the study.

An important empirical finding is that state accountability is a central component of mineral governance, closely correlated with state capacity and with monitoring and enforcement. We measured state accountability by investigating the laws and participatory institutional mechanisms that citizens and civil society can use to hold the state and mining companies to account. The centrality of accountability shows that state officials most diligently keep track the activities of mining companies when they know that that citizens and civil society are keeping track of them. Although adopting appropriate policies and building administrative capacity are important, the study suggests that laws and institutions that give voice to the ostensible beneficiaries of mineral extraction are perhaps the most fundamental bases for the effective. The study also helped to identify gaps in regulatory presence – a composite of regulations, monitoring, and enforcement. Overall we found that many of the kinds of regulations advocated in documents like the Africa Mining Vision are in place, but there is an absence of observable evidence of effective monitoring and enforcement. Our in-country researchers provided anecdotal reminders that

failures in monitoring and enforcement do not necessarily reflect a general lack of capacity but can sometimes be explained by corruption and other accountability failures. Regulatory presence also varied by issue-area, being somewhat greater for labour and environment than for national economic and fiscal linkages and community impact. One possible explanation is that citizens and civil society are often better organised around labour and environmental issues, while affected constituencies in the other issues-area are more likely to be sectorally fragmented (economic and fiscal linkages) or geographically isolated (community impact).

As a pilot study, the barometer provides a useful baseline for more systemic analysis of mineral governance in Southern Africa. An obvious direction for further research would be to extend the barometer to other countries, and perhaps to extend sectoral coverage to petroleum. Another complementary direction would be to probe patterns of contestation across a range of key stakeholders – from the state and mining companies to labour unions and civil society organisations. The current study has focused on collecting evidence to describe patterns of regulatory presence. In doing so it uncovered the substantive importance of accountability mechanisms and methodological challenges of observational equivalence. For example, the absence of penalties imposed on mining companies could be a sign of poor state enforcement or high company compliance, and widespread penalties imposed on mining companies could be a sign of strong state enforcement or of confrontational state-company relations. A clearer picture of subjective stakeholder views would help to clarify the kind of objective descriptive evidence contained in this study.

References

- African Union. 2009. *Africa Mining Vision*. Addis Ababa: African Union.
- Alence, Rod. 2015. "Where Did Africa's Resource Go?" *Resource Insight* 16. Johannesburg: Southern African Resource Watch.
- Bannerjee, Sudeshna Ghosh, Zayra Romo, Gary McMahon, Perrine Toledano, Peter Robinson and Inés Pérez Arroyo. 2015. *The Power of the Mine: A Transformative Opportunity for Sub-Saharan Africa*. Washington: World Bank.
- Barma, Naazneen H., Kai Kaiser, Tuan Minh Le, and Lorena Viñuela. 2012. *Rents to Riches? The Political Economy of Natural Resource-Led Development*. Washington: World Bank.
- Bond, Patrick. 2006. *Looting Africa: The Economics of Exploitation*. Scottsville, South Africa: University of KwaZulu-Natal Press.
- Burgis, Tom. 2015. *The Looting Machine: Warlords, Tycoons, Smugglers and the Systematic Theft of Africa's Wealth*. London: William Collins.
- Campbell, Bonnie. 2003. "Factoring in Governance Is Not Enough: Mining Codes in Africa, Policy Reform and Corporate Responsibility." *Minerals and Energy* 18, no. 3: 2-13.
- Easton, David. 1957. "An Approach to the Analysis of Political Systems." *World Politics* 9, no. 3: 383-400.
- Extractive Industries Transparency Initiative. 2016. *The EITI Standard*. Oslo: EITI International Secretariat.
- Extractive Industries Transparency Initiative. 2010. *Overview of EITI Reports*. Oslo: EITI International Secretariat.
- Gatz, Donald F., and Luther Smith. 1995. "The Standard Error of a Weighted Mean Concentration – Bootstrapping vs. Other Methods," *Atmospheric Environment* 29, no. 11: 1185-1193.
- Grant, Andrew, and Ian Taylor. 2004. "Global Governance and Conflict Diamonds: The Kimberley Process and the Quest for Clean Gems." *The Round Table* 93, no. 375: 385-401.
- Jackson, Taylor, and Kenneth P. Green. 2015. *Fraser Institute Annual Survey of Mining Companies, 2015*. Vancouver: Fraser Institute.
- Kabemba, Claude. 2013. "Myths and Mining: The Reality of Resource Governance in Africa." *Open Debate* 8. Johannesburg: Southern Africa Resource Watch.
- Kamlongera, Paul Justice. 2013. "The Mining Boom in Malawi: Implications for Community Development," *Community Development Journal* 48, no. 3: 377-390.

- Lewis, Stephen R., Jr. 1989. "Primary Exporting Countries," in *Handbook of Development Economics*, ed. Hollis Chenery and T.N. Srinivasan, vol. 2, 1541-1600. Amsterdam: North-Holland.
- Revenue Watch Institute. 2013. *Resource Governance Index: A Measure of Transparency and Accountability in the Oil, Gas and Mining Sector*. New York: Revenue Watch Institute.
- Southern Africa Resource Watch. 2013. *Southern Africa Resource Barometer*. Southern African Resource Watch. Southern African Development Community Parliamentary Forum: Johannesburg.
- Southern African Development Community. 2014. *SADC Statistical Yearbook, 2014*. Gaborone: Southern African Development Community.
- United Nations Economic Commission for Africa. 2011. *Minerals and Africa's Development: The International Study Group Report on Africa's Mineral Regimes*. Addis Ababa: United Nations Economic Commission for Africa.
- United Nations Economic Commission for Africa and Southern African Development Community. 2004. "Harmonization of Mining Policies, Standards, Legislative and Regulatory Frameworks in Southern Africa," ECA/SA/TPub/Mining/2004/03 (30 December).
- World Bank. 2016a. "The Mining Investment and Governance Review: Overview," online summary, <http://www.worldbank.org/en/programs/mingov#1> (accessed 20 September 2016).
- World Bank. 2016b. *The Mining Investment and Governance Review (MInGov): Methodology*. Washington: World Bank.
- World Bank. 2011. *The Changing Wealth of Nations: Measuring Sustainable Development in the New Millennium*. Washington: World Bank.
- Yager, Thomas R. 2016. "The Mineral Industry of Madagascar," 2013 *Minerals Yearbook*. Washington: United States Geological Survey.
- Yager, Thomas R. 2014. "The Mineral Industry of Congo (Kinshasa)," 2012 *Minerals Yearbook*. Washington: United States Geological Survey.

Appendix:

Statistical Summaries

Table 3: Univariate Descriptive Statistics

	mean	median	minimum	maximum
State Capacity	0.54	0.49	0.28	0.93
State Accountability	0.63	0.61	0.45	0.92
Regulation	0.63	0.67	0.35	0.82
Linkages	0.47	0.58	0.08	0.75
Community Impact	0.57	0.65	0.13	0.92
Labour	0.80	0.79	0.50	1.00
Environment	0.68	0.75	0.50	0.75
Monitoring/Enforcement	0.28	0.30	0.02	0.54
Regulatory Presence	0.40	0.40	0.23	0.56
Linkages	0.29	0.31	0.04	0.58
Community Impact	0.35	0.40	0.08	0.65
Labour	0.48	0.46	0.28	0.65
Environment	0.48	0.52	0.28	0.59
ASM	0.64	0.75	0.00	1.00
Aggregate	0.52	0.48	0.36	0.77

Table 4: Selected Bivariate Correlations

	Cap	Acct	Reg	Mon/ Enf	Reg Pres	Agg
Capacity	1.00	0.36	0.19	0.32	0.32	0.74
Accountability	0.36	1.00	0.34	0.79	0.69	0.85
Regulation	0.19	0.34	1.00	-0.08	0.88	0.50
Monitoring/Enforcement	0.32	0.79	-0.08	1.00	0.40	0.69
Regulatory Presence	0.32	0.69	0.88	0.40	1.00	0.79
Aggregate	0.74	0.85	0.50	0.69	0.79	1.00

Table 5: Mineral Governance Indicators (estimates and standard errors)

	State Capacity		State Accountabil-ity		Regulations		Monitor/Enforce		Regulatory Presence		Aggregate	
	est.	std. err.	est.	std. err.	est.	std. err.	est.	std. err.	est.	std. err.	est.	std. err.
Botswana	0.908	0.049	0.509	0.101	0.760	0.084	0.105	0.039	0.420	0.047	0.571	0.050
Congo, DR	0.300	0.101	0.625	0.099	0.698	0.082	0.164	0.065	0.406	0.050	0.447	0.052
Lesotho	0.283	0.096	0.448	0.106	0.705	0.084	0.022	0.022	0.360	0.045	0.365	0.044
Madagascar	0.521	0.096	0.451	0.100	0.604	0.088	0.276	0.068	0.385	0.048	0.463	0.052
Malawi	0.463	0.094	0.651	0.093	0.514	0.090	0.334	0.091	0.343	0.050	0.490	0.059
Namibia	0.564	0.094	0.498	0.095	0.347	0.085	0.315	0.095	0.228	0.040	0.431	0.062
Swaziland	0.447	0.101	0.590	0.096	0.396	0.088	0.237	0.084	0.245	0.041	0.417	0.060
South Africa	0.925	0.046	0.917	0.047	0.781	0.077	0.440	0.071	0.562	0.052	0.766	0.047
Zambia	0.364	0.096	0.703	0.091	0.823	0.069	0.335	0.067	0.549	0.052	0.556	0.051
Zimbabwe	0.612	0.090	0.862	0.051	0.646	0.085	0.540	0.080	0.497	0.053	0.665	0.049

Note: Standard errors for the (weighted) estimates are calculated using the Cochran method as described by Gatz and Smith (1995: 1186). Confidence intervals in the figures in report are centred on the estimate, plus or minus 1.16 standard errors – meaning that the null hypothesis of no difference can be rejected for two horizontally non-overlapping intervals with roughly 90 per cent confidence. Issue-area indicators and Licenses/Contracts are not reported because they are based on too few component scores to calculate meaningful standard errors, and the estimates themselves are included in figures in the main report.



OSISA is a growing African institution committed to deepening democracy, protecting human rights and enhancing good governance in the region. Its vision is to promote and sustain the ideals, values, institutions and practices of open society, with the aim of establishing vibrant and tolerant southern African democracies in which people, free from material and other deprivation, understand their rights and responsibilities and participate actively in all spheres of life.

In pursuance of this vision, OSISA's mission is to initiate and support programmes working towards open society ideals and to advocate for these ideals in southern Africa. Established in 1997, OSISA works in 11 southern African countries: Angola, Botswana, DRC, Lesotho, Malawi, Madagascar, Mozambique, Namibia, Swaziland, Zambia and Zimbabwe. OSISA works differently in each of these countries, according to local conditions.

OSISA is part of a network of autonomous Open Society Foundations, established by George Soros, located in Eastern and Central Europe, the former Soviet Union, Africa, Latin America, the Caribbean, the Middle East, Southeast Asia and the US.



SARW is a formative project within the Natural Resources Governance Initiative of OSISA. Its main objective is to monitor corporate and state conduct in the extraction and beneficiation of natural resources in Southern Africa. It seeks to assess the extent to which the policies, practices and efforts of the players in the sector can and do contribute to sustainable development. Other specific objectives include:

- To consolidate research and advocacy on natural resources extraction issues in Southern Africa;
- To put a spotlight on the specific dynamics of natural resources in Southern Africa, building a distinctive understanding of the regional geo-political dynamics of resource economics;
- To provide for researchers, policy makers and social justice activists especially in academic and civic spaces- a platform of action, coordination and organisation, in the watching and strengthening of corporate and state accountability in natural resources extraction;
- To highlight the relationship between resource extraction activities and human rights as they obtain on the ground, and develop advocacy efforts that engage this reality.

