



VALE COLUMBIA CENTER
ON SUSTAINABLE INTERNATIONAL INVESTMENT
A JOINT CENTER OF COLUMBIA LAW SCHOOL AND
THE EARTH INSTITUTE AT COLUMBIA UNIVERSITY

Resource-Based Sustainable Development in the Lower Zambezi Basin

A draft for consultation

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The Vale Columbia Center on Sustainable International Investment seeks to be a leader on issues related to foreign direct investment (FDI) in the global economy, paying special attention to the sustainability dimension of this investment. Its objectives are to analyze important topical policy-oriented issues related to FDI, develop and disseminate practical approaches and solutions, and provide students with a challenging learning environment. Founded in 2006 as the Columbia Program on International Investment, the Center became the Vale Columbia Center on Sustainable International Investment (VCC) in 2008.

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This consultative draft is meant to foster discussion and multi-stakeholder collaboration and engagement on how Mozambique’s natural resources can be leveraged for sustainable development in the region. As such, it is a “living” draft and remains a work in progress. The VCC looks forward to continued discussion with all stakeholders in Mozambique on these issues, including further feedback and comments on this consultative draft.

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List of Acronyms

ACIS	Sofala-based Business Association
AFD	Agence Française de Développement
AfDB	African Development Bank
AfSIS	Africa Soil Information Service
AGRA	Alliance for a Green Revolution in Africa
AICD	Africa Infrastructure Country Diagnostics
AMDCM	Mozambican Association for Mineral Coal Development
ATM	Mozambique Tax Authority
AU	African Union
BAGC	Beira Agricultural Growth Corridor
bn	billion
CBH	Cahora Bassa Hydrostation
CCFB	Companhia dos Caminhos de Ferro de Beira SARL
CDN	Corredor de Desenvolvimento do Norte
CEAR	Central East African Railways
CFM	Caminho de Ferro de Moçambique
CIP	Centro de Integridad Publica
COCEP	Commission for Studies and Projects
COMESA	Common Market for Eastern and Southern Africa
COREP	National Public-Private Commission for TVET Reform
CPI	Mozambican Investment Promotion Center
CSR	Corporate Social Responsibility
CTA	Confederation of the Business Associations of Mozambique
DANIDA	Danish International Development Agency
DFID	UK Department for International Development
EDM	Electricidade de Moçambique
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
ESCOM	Electricity Supply Corporation of Malawi
ETR	Effective Tax Rate
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization
GAPI	Gabinete de Consultoria e Apoio à Pequena Indústria
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	German Company for International Cooperation
GMD	Mozambique Debt Group
GSDI	Global Spatial Data Infrastructure Association
Ha	Hectare
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
HMNK	Mphanda Nakuwa Hydroelectric Dam
ICT	Information and Communication Technology
IESE	Institute de Estudos Sociais e Económicos
IFC	International Finance Corporation
IFDC	International Fertilizer Development Center

IGM	Instituto de Geología e Minas
IMF	International Monetary Fund
INE	Institute for National Sciences
INGC	National Disaster Management Institute
IPEME	Institute for the Promotion of Small and Medium Enterprises
IPEX	Institute for Export Promotion
IRCON	Indian Railway Construction International
IRD	Integrated Rural Development
IRDP	Integrated Rural Development Project
IRR	Internal Rate of Return
IWRM	Integrated Water Resource Management
JA	Justiça Ambiental
JICA	Japan International Cooperation Agency
KfW	German Development Bank
kg/ha	Kilograms per hectare
kV	Kilovolt
M&E	Monitoring and Evaluation
Mbp	Megabits
MCC	Millennium Challenge Corporation
MCLI	Maputo Corridor Logistics Initiative
MDA	Mineral Development Agreement
MDGs	Millennium Development Goals
METI	Mozambique Extractive Industries Transparency Initiative
MICOA	Ministry for the Coordination of Environmental Action
MIGA	Multilateral Investment Guarantee Agency
MINAG	Ministry of Agriculture
MIREM	Ministry of Mineral Resources
MPD	Ministry of Planning and Development
Mt	Megatons (1 million metric tons)
MTC	Ministry of Transportation and Communication
MTEF	Medium Term Expenditure Framework
Mt	Megatons
MV	Millennium Village
MVP	Millennium Villages Project
MW	Megawatt
NAPA	National Adaptation Program of Action
NEPAD	New Partnership for Africa's Development
NGO	Non-Governmental Organization
PAF	Performance Assessment Framework
PAPA	Food Production Action Plan
PARP	Plan of Action for the Reduction of Poverty
PARPA	Plan of Action for the Reduction of Absolute Poverty
PES	Economic and Social Plan
PFM	Public Financial Management
PIP	Public Investment Program
PPP	Public-Private Partnership
PRISE	Integrated Road Sector Program
REDD	Reducing Emissions from Deforestation and Forest Degradation

RICON	Consortium of RITES and IRCON
RITES	Rail India Technical and Economic Services
RRT	Resource Rent Tax
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SCDN	Sociedade de Desenvolvimento do Corredor de Norte
SDI	Spatial Development Planning Initiatives
SMEs	Small and Medium Enterprises
TVET	Vocational Education and Training
UEM	Eduardo Mondlane University
UN	United Nations
UNDP	United Nations Development Program
UNECA	United Nations Economic Commission for Africa
UNEP	United Nations Environment Program
UNFCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
UNPEI	United Nations Poverty-Environment Initiative
USAID	United States Agency for International Development
USD	United States Dollar
VCC	Vale Columbia Center on Sustainable International Investment
WB	World Bank
WWF	World Wildlife Fund

Executive summary

Mozambique's natural resources can be highly profitable for both investors and Mozambique's citizens. The goal of all stakeholders is a mutually beneficial, long-term relationship, which enables the profitability of the industry as well as ensures that the investments translate into widespread development benefits for the population. In fact, ensuring that extractive activities contribute to sustainable and equitable development is in the mutual interest of governments and companies, both of which benefit from advances in development—at the community and national levels—over the long term.

The challenge is therefore to develop and apply a framework to turn resource wealth into effective and sustained economic development that is inclusive and contributes to poverty reduction, including through infrastructure development, linkages with local industries, the transfer of capital and technology, job creation, and capacity building. That the resources are non-renewable puts a premium on developing such a strategy at the early stages of production.

Resource-based development requires a complex cooperative network connecting governments, business, civil society, local communities, and international organizations and partners. However, even though all stakeholders have the same ultimate goal—namely, long-term sustainable development supported by profitable investments in the extractive sector—the practical approaches to achieve this end are complex and typically beyond the remit of any one partner. Moreover, the potential synergies between national or regional priorities and the companies' investments are often missed, and there is rarely an assessment of the regional (trans-national) development potential of these massive investments, through regional integration, cross-border infrastructure developments, regional trade, and regional energy transmission.

The African Union's Mining Vision, adopted in 2009, aims to achieve “transparent, equitable and optimal exploitation of mineral resources to underpin broad-based sustainable growth and socio-economic development.”¹ This Mining Vision outlines how natural resources can contribute meaningfully to concrete development outcomes in Africa by 2050. Implementing the African Mining Vision and ensuring that the extractive industry investments contribute to the economic diversification and long-term sustainable development of Mozambique is the goal of this report. Specifically, this report aims to support a mutually beneficial framework of common actions and purposes within which the long-term sustainable development process in Mozambique and the Lower Zambezi region can best proceed. Each of the five chapters in this report identifies concrete actions and opportunities to realize the shared vision of resource-based development.

Chapter 1 describes the needs and opportunities for investing in integrated regional development in the Zambezi Valley, including both Mozambique and Malawi, where more than 70% of the population is rural farming households, and the potentially transformative extractive industry is still a recent phenomenon. Without targeted investments in rural development, the urban-rural income divide will worsen and likely give rise to political and social unrest. Mining regions generally suffer from economic disruptions such as a surge in demand-driven prices and, especially, food prices that

¹ www.uneca.org/csd/.../AfricanReviewReport-on-MiningSummary.pdf

can only be mitigated by increasing investments in agricultural production and raising the incomes of local communities. Chapter 1 focuses especially on rural communities in the Zambezi valley, as they represent a very large majority of the countries' low-income households. Ensuring that the extractive industry investments in the Zambezi region benefit the region necessarily means scaled-up investments in the development of these communities to ensure food security, reduced incidence of preventable diseases, and increased access to basic education and infrastructure. Chapter 1 recommends targeted public-private partnerships to scale-up development in these communities, including developing agro-business alliances, a regional agricultural research and development facility, improved soil and land information, and integrated rural development projects, drawing on the experience of Millennium Villages. These recommendations aim to reinforce and expand multi-sector investments through the Government of Mozambique's current approach of development corridors.

Unleashing the agriculture productivity through this targeted public-private investment strategy will create a healthy productive base for the economy. Complementary investment in infrastructure and human capital are needed to ensure economic diversification and development. This is the focus of Chapter 2. Currently, the lack of infrastructure—rail, roads, energy, water—and an underdeveloped workforce are limiting the ability of the country to reach its full potential. Increased investments in both infrastructure and capacity building are necessary both for improved productivity on smallholder farms and for optimal operations of the mega-projects and mining investments. Chapter 2 discusses how improved maintenance and expansion of crucial infrastructure and human capital along the Beira and Nacala corridors would help create upstream linkages (in the services industry and mining inputs) and downstream linkages (into mineral beneficiation) conducive to a diversified economy. A sound regulatory framework is necessary to oversee these investments, coordinate public and private actors, and ensure equal and fair treatment of all stakeholders and isolation from political interference. In the Nacala corridor, the requisite regulatory framework is complicated by cross-border infrastructure and trade arrangements. Multi-stakeholder cooperation in leveraging the resource sector for an improved regulatory framework and industrial development along the corridors is in the mutual interest of the individual stakeholders. Chapter 2 proposes specific activities for multi-stakeholder engagement, including building an aspirational infrastructure map and establishing a National Linkage Center, among other activities.

Investments in mining, infrastructure, agriculture, and other economic activities necessarily present environmental risks that could result in long-term irreversible impacts without careful management. Chapter 3 discusses the particular challenges of environmental protection, risk mitigation, and climate change resilience, especially in the context of the impacts of mining, transportation, and other economic activities. While many countries have mine site or project-specific environmental impact assessments, the cumulative impacts may not be known. Chapter 3 proposes an environmental management system that includes cumulative risk assessments and mitigation strategies, considering the many competitive uses of land and water in the Zambezi Valley, their combined environmental impacts, and necessary corresponding policies to ensure environmental protection.

The path to economic diversification will need to be embedded in a long-term development strategy for managing resource revenues, supported by multi-year planning and budgetary mechanisms. The extent to which both linkages and increased revenues will contribute to national development depends on Mozambique's planning and financial institutions and capacity. Chapter 4 discusses how to approach a government strategy for managing resource revenues, including long-term

development planning tools that bring coherence to national and sector-specific plans; identifying public investment priorities; aligning the budget and budgetary mechanisms with the planning process and public investment plans; and designing a revenue management and allocation plan to support the national development strategy. Chapter 4 discusses the value of a credible and comprehensive medium-term expenditure framework, financial models of anticipated resource revenues, and improving the coordination of the private sector and development partners with respect to the national development strategy.

The extractive industries in Mozambique—including coal, natural gas, mineral sands, phosphates, and other natural resources—are expected to continue to grow in the near future. While early investments were considered risky in the years after Mozambique’s civil war, Mozambique is no longer an untested investment destination. Mozambique has proven itself stable for investments, and government institutions and the regulatory framework continue to improve. Companies can be profitable, and continued investments in infrastructure will continue to increase the profitability of investments. Mozambique’s legal framework and fiscal regime can and should reflect this improved investment climate, requiring more benefits from future investors, through revenues, infrastructure investments and corporate social responsibility (CSR) commitments. Chapter 5 discusses how the government can design a progressive, transparent, and fair fiscal and regulatory framework for the extractive industries, as well as how the Mozambique Extractive Industries Transparency Initiative (MEITI) presents an opportunity to establish rigorous operational and fiscal audits to monitor the implementation of contracts and enshrine transparency in the relevant institutions.

While ambitious, with adequate support and pooled resources, many of these opportunities are indeed within reach. To support their implementation, the conclusion of this report contemplates establishing three structures to support and enable further progress: a Zambezi Valley Resource-Based Development Coordinator, to support the relevant ministries and to connect and coordinate partners and institutions working toward sustainable and equitable resource-based development in the Zambezi region; an international Resource-Based Development Advisory Group, to assist in the planning and implementation of a resource-based development strategy; and a Zambezi Valley Resource Policy Forum, at which all stakeholders can assess needs and opportunities, monitor progress, and plan for the future.

This draft is a consultative draft. Although every opportunity and idea in this report reflects conversations and information accessed in the region, **the VCC will now consult widely with this report: (1) to seek guidance on whether this report accurately reflects the vision of the stakeholders, and (2) to work with stakeholders to develop a road map for implementation.**

Summary of recommendations, by chapter

Chapter One

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Unlocking the agriculture potential in the Beira and Nacala corridors	<p>Expanding rural roads network by prioritizing the most fertile regions, such as the highly untapped productive areas of Tete province where demand for food commodities is increasing rapidly</p> <p>Strengthening and scaling up rural finance institutions and initiatives, such as GAPI and the AGRA-MCA fund, drawing on successful recent financial leveraging experience from Nigeria and other countries, and possibly bundling with risk transfer instruments including index-based weather insurance</p> <p>Establishing the Zambezi Valley Agriculture Development Center (1) for smallholder-focused adaptive research (including climate risk management), seed multiplication, extension, and training throughout the region, 2) to be located in Tete and operate in a decentralized agro-ecosystem-based manner through existing government facilities)</p> <p>Adopting a voucher-based input subsidy program (1) focused on both productivity improvement and post-harvest improvement, 2) with strong participation of agro-dealers, 3) drawing on experience of the region</p> <p>Assembling up-to-date, spatially referenced soil and climate information to support agriculture in the most agronomically suited regions of Beira and Nacala corridors by extending the work of AfSIS and linking with weather/climate monitoring efforts over a longer time scale</p> <p>Establishing the Agro-Business Alliance of Extractive, Agriculture, and Food Industries with the objective of supporting the commercialization of smallholder agriculture in the Zambezi Valley</p>	<p>Min. of Public Works and Housing, Min. of Agriculture, MPD, MICOA</p> <p>Local Governors, National Road Authority (ANE), ,</p>	<p>Central Soil Laboratory in Maputo, Extractives, Mosaic, Agrium, Walmart, AGRA, CGIAR</p> <p>National Institute of Meteorology (INAM)</p>	<p>WB, AfDB, MCC/MCA, USAID, Embrapa, AGRA, CGIAR, BAGC, CEPAGRI, GAPI, IFDC, AFSIS, CIESIN, ICRAF, CIAT-TSBF, ISRIC, ILO, IRI, WMO, Columbia University</p>
Integrated Rural Development (IRDP) in the Beira and Nacala corridors	<p>Designing and implementing a network of IRDPs in the provinces of Tete, Niassa, Nampula, Zambezia, Sofala, Manica and Gaza provinces, to be informed by a study of existing MV and other rural development projects during June-August 2011, conducted by the MST and the Earth Institute at Columbia University.</p> <p>Establishing a National IRDP Policy Support Secretariat to facilitate inter-agency coordination, synthesize IRDP experience to inform national policy, and coordinate capacity building, monitoring and evaluation and resource mobilization for program expansion</p> <p>Supporting selected universities in Mozambique to develop and implement new undergraduate and master's level programs in sustainable development practice</p>	<p>Min. of Agriculture, Min. of Science and Technology (MST), MPD, Min. of Health, Min. of Education, Min of Labor, Min. of Public Works and Housing, Min. of Energy</p>	<p>MST's network of MV, University Eduardo Mondlane, University Lurio, Africare</p>	<p>Earth Institute/ Columbia University, UNDP, USAID</p>

Chapter Two

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Aspirational 10- year map and comprehensive database	<p>Planning tool for Transport and Energy Sector (to identify potential for shared platforms with mega-projects, to anticipate risks of congestion on corridors, to revive stalled projects, to invest in missing links) Backed by data survey and transport sector statistics</p> <p>Can motivate the creation of a fund to facilitate more investments in infrastructure and in operations and maintenance of it</p>	MTC, COCEP, MPD	National Statistics Institute, Current and Future Investors in infrastructure	WB, AfDB, GSDI
Completing two key trunk infrastructure of the Beira Corridor by leveraging partnership	<p>Renewing the Sena line concession arrangement by implementing the multi-user model, maximizing public interest and economic viability</p> <p>Renewing the corridor regulatory framework respecting 5 principles (1) 25-30 year- concession period, 2) non-discriminatory tariffs, 3) monitoring and auditing commission of multi-disciplinary experts to audit concession returns and applied tariffs, 4) coding regime into PPP legislation 5) strong independent regulatory body precluding political interference)</p> <p>Leveraging the partnership of the Sena Line put forth by the multi user model to ensure the completion of CESUL, Phase 2</p>	MTC, SDI Unit, CFM	AMDCM, Coal Mining Companies, IPPs, ESKOM	AfDB, DFID, European Investment Bank, WB
Completing two key trunk infrastructure of the Nacala Corridor by cross-border integration	<p>Devising operational and binding cross-border arrangement (1) integrated border and corridor management under a steering committee of SADC or COMESA, 2) consultation with stakeholders under a Corridor Logistic Initiative such as MCLI, 3) establishment of the binding nature of the cross-border agreements into the national law, 4) cross-border logistic solutions to enable shared platform with the rest of economy)</p> <p>Leveraging the cross-border approach of the Nacala Line to revive the Interconnector (joint financing for each phase, SAPP project coordinator, pooled resources in designing a well-package project)</p>	MTC, SDI Unit, CFM, CEAR, Ministry of Energy, EDM, Local governors, ESCOM, SADC, SAPP	Vale, CDN and other Minority Stakeholders, IFC, MIGA	African Union, DFID, WB, AfDB, JICA, Norway Embassy, Chinese EXIM Bank
Public-private partnership for the diversification of the economy	<p>Strong industrial policy to lift inhibitors of value addition (1) targeting human resource constraints, 2) enabling the business environment, 3) shifting toward a value chain approach)</p> <p>Collaborative approach to set up a National Linkage Center (1) to identify the right value chains, 2) to monitor value-addition of linkage program, 3) to advise on suitable corporate policies, 4) to suggest public-private sponsored initiatives)</p> <p>Collaborative approach to set up a competitiveness commission (1) to assess potential for downstream, and 2) its related fiscal and investment policy)</p>	Min. of Education, Min. of Labor, Min. of Science and Technology, COREP, Min. of Commerce and Industry, SDI	IGM, Instituto Superior Politecnico, LEM, Don Bosco, UEM, Local Banks, IPEM, IPEX, ACIS, CTA, Megaprojects	Italian Cooperati-on, Canadian Cooperati-on, WB, UNDP, Danida, GIZ, IFC

Chapter Three

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Strategic cumulative impact assessment (CIA) study, and monitoring program	<p>Joint initiative to assess cumulative environmental direct impacts of mining operations as actually experienced by local communities and stakeholders (water pollution and water resource management, air pollution and greenhouse gas emissions, soil and land degradation, and effects on biodiversity)</p> <p>Expanding the CIA to include competitive use of water and land to inform policy making related to water and land use, using GIS and to be coordinated at cross-border level, especially for cross-border warning system for flood alerts and integrated water resource management plan (IWRM)</p>	MICOA, MPD, Min. of Agriculture	AMDCM, Mining Companies, SDI unit	UNEP, UNIDO, WMO, GSDI, ACWR, Impacto, Consultec
Strengthening environmental governance	<p>Investing in technical assistance for government employees involved in environmental assessment and licensing at national and local level</p> <p>Updating the legal and regulatory regime, maximizing environmental protection while promulgating realistic guidelines (1) establishment of stringent emission and pollution limitations, 2) assessment of water concession period and value of assurance bonds according to cumulative impacts of mines</p> <p>Designing enforcement mechanisms (1) audits before license renewal, 2) continuous monitoring of industrial activities, 3) applying significant penalties for environmental violations, 4) enshrining transparency in system and 5) ensuring better public participation and oversight)</p> <p>Adopting CIA at Ministry level (through an inter-ministerial unit in order to strengthen institutional linkage and assessment of environmental challenges as a cross-cutting issue)</p>	MICOA	Industry, Government, Civil Society Organizations, National Universities	UNDP, UNPEI, Earth Institute/ Columbia University
Public-private cooperation to achieve climate-resilient development	<p>Mitigating climate risks and realize opportunities through 1) disaster risk reduction; 2) managing climate risks with systems reducing vulnerability, with an emphasis on strategies to reduce rainfall-induced production variability; and 3) adaptation to climate change, with a focus on high-risk areas and sectors</p> <p>Building science, information systems and capacity with a focus on 1) impacts of weather/climate on development; 2) climate processes and science, including forecasting; and 3) techniques for integrating climate information into decision and policy-making</p> <p>Making the climate risk and opportunity management approach an integral part of development policy, planning, and governance with an emphasis on public-private cooperation and multi-stakeholder engagement</p> <p>Mitigating climate change by 1) pooling resources to fund improvements in the logistics of operations required by the implementation of REDD; and 2) GHG emissions standards enumeration by the government, respected by mining companies (through technical solutions to incorporate green technology into activity industries or carbon-offsetting programs)</p>	MPD partnering with MICOA, INGC, Min. of Agriculture,	National Institute of Meteorology (UNAM), NAPA, Other Ministries, Private sector (including insurance/finance industry, agriculture supply chain, etc.) UEM, Civil Society Organizations	UNFCC, AfDB, IIED, UNDP, , Earth Institute, the African Centre of Meteorological Applications for Development (ACMAD), WMO, IGAD Swiss Re, IFRC, WB, CLIM DEV, Forum for Agricultural Research in Africa (FARA), ENDA.

Chapter Four

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Planning for resource-based development	<p>Medium-term development plans should include resource-based infrastructure, linkages, revenue management, domestic resource needs, and cumulative environmental risks</p> <p>Creating an inter-ministerial commission 1) to supervise the PIP, 2) to oversee statistical analysis, 3) to ensure consistency of planning tool, 4) to begin streamlining various development plans</p>	MPD	Other Ministries, Development Partners, Provincial Governments	Development Partners
Aligning and operationalizing key objectives, priorities and actions of development plans	<p>Streamlining central and sector planning documents to focus on priority issues in line with MDG targets</p> <p>Creating an institutional framework for engaging line ministries, donors, and private sector</p> <p>Designing a PIP to identify and cost strategic public investment projects and align with financing options</p> <p>Streamlining M&E indicators and processes, reducing redundant reporting and administration, and increasing rigor of statistical analysis.</p> <p>Convening a planning workshop for MPD and line ministries</p>	MPD, Min. of Finance	Other Ministries, Development Partners, Provincial Governments, Private Sector	Development Partners
Preparing a robust MTEF	<p>Reconciling the budget process with the MTEF</p> <p>Aligning and costing key development priorities (such as the PIP) in the MTEF</p> <p>Modeling available resources (tax and other revenues, donor support, extra-budgetary funds and quasi-fiscal activities, such as private-sector expenditures)</p>	MPD, Min. of Finance	Other Ministries, Development Partners, Provincial Governments	IMF, WB
Improving efficacy of donor support and private-sector development activities	<p>Increasing the transparency and predictability of donor allocations over MTEF time horizon</p> <p>Coordinating donor support among the donors and around the government's identified priorities</p> <p>Channeling more donor support through the government's own systems and reporting all according to budget classification</p> <p>Aligning private-sector development activities with government's priorities and systems</p>	MPD	Other Ministries, Development Partners, Private Sector	Development Partners
Monitoring the national development planning process	<p>Improving Budget Transparency (such as through enhanced MEITI)</p> <p>Supporting civil society and private-sector engagement in planning and monitoring processes</p>	MPD, Min. of Finance	MEITI, Debt Group, FDC, CPI	Development Partners, Private Sector

Chapter Five

Recommendations	Main Features	Led by	Stakeholders	Technical Assistance
A commission to lead comprehensive review and updating of legal framework and assess grounds for upgrading contracts	<p>This commission could:</p> <p>1) Review current contracts and legal framework, ensure lessons are learned and assess whether and how current contracts might merge into the new framework. In particular, the commission could focus on reviewing the fiscal and non-fiscal benefits of existing legislation and contracts, and the possibilities for (1) implementing resource rent taxation, (2) implementing capital gains taxation, (3) clarifying the royalty base, (4) limiting the currently overly-broad stability guarantee, (5) reforming confidentiality provisions to reflect government policy of transparency, and (6) streamlining depreciation schedules and capital allowances. Other mineral policy aspects, not dealt with in this report, could also be included in the review, such as resettlement policies and artisanal and small-scale mining, among others, similar to the Tanzanian Bomani Commission.</p> <p>2) Reflect the diversity of Mozambican society and include a wide-array of expertise to have international and national credibility. It could also usefully rely on the many pro bono and international perspectives from SADC colleagues, the Resource-Based Development Advisory Group, and others.</p> <p>3) Provide updated Mining Laws and Regulations and an updated Model Contract</p> <p>4) Plan for independent financial modeling to be conducted for all future contracts after the Commission has completed its work</p>	MIREM	AMDCM, PPP, and Concession Holders, Civil Society Organizations (CSOs)	World Bank, IMF, AfDB, UNDP, SADC, IFC, Academia
Training scale-up for implementing institutions	<p>Building on trainings in contract negotiations from UNDP with deeper and longer trainings for all relevant ministries, with a focus on skill-building such as financial modeling and mock negotiations</p> <p>Scaling up auditing training, particularly if more complex taxation mechanisms are included in an updated law (like the suggested RRT) and/or model contract</p>	MIREM, Min. of Finance	Min. of Finance, MPD, MTC, AMDCM, CSOs, Academia	UNDP, AfDB, IMF, World Bank, Academia
Deepened and strengthened EITI	<p>Deepening the EITI to include (1) more companies (2) financial, physical, and process audits (3) contract disclosure (4) infrastructure and CSR expenditures and audits and (5) link to budget transparency</p> <p>Using an EITI law to implement these innovations</p>	MIREM, MEITI	Multi-Stakeholder Groups	World Bank Trust Fund for EITI, AfDB

Introduction to the Lower Zambezi Basin and the VCC Five-Pillar Framework

An area of enormous opportunity: the Lower Zambezi Basin

The Lower Zambezi River basin in Mozambique is one of the world's poorest regions, yet also one of tremendous highly diversified development potential. Not only does Mozambique have substantial untapped mineral resources—the major anchor of this particular study—the country also has 10 million hectares of arable land; 2,500 kilometers of coastline with five ports; major transport corridors with the capacity to interconnect not only Mozambique's populations, but also its land-locked neighbors of Malawi, Zambia, and Zimbabwe; proximity to the South African economic market; and a large and young labor force.

The coal sector in particular is set to boost Mozambique's economy, with estimated resources of 23,000Mt.² The area is considered to be the largest untapped coal reserve in the world, with the capacity to drive the region's growth for decades to come. In September 2010, the Deputy Minister of Mineral Resources announced that eight coal mines will be operating in Tete province by 2016, with a total output of 48Mt per annum by 2017 and 100 Mt per annum by 2025.³ Tete province also holds the bulk of the 12.5 gigawatts of power generation potential in Mozambique. Recent scholarly literature has emphasized that "Tete has unique attributes that make it ideal for development into the next regional industrial hub for Southern Africa."⁴ In addition to the world-class deposits of coal in Tete Province, Mozambique has confirmed deposits of phosphates, natural gas, and substantial hydropower potential. Tete Province and Mozambique are well-positioned to benefit from the large investments in their natural resources. The challenge for the region is to harness its economic potential for regional integration, and sustainable, diversified and inclusive growth.

Extractive industries can be important levers for long-term resource-based sustainable development, through revenue generation, infrastructure development, and technology and capital transfer, among other channels; however, the manner and extent to which these benefits actually accrue to host countries depend heavily on the policies and practices of host countries and extractive companies. The well-known "resource curse" can become a reality, in which the benefits of the mining sector are squandered through overvalued exchange rates and mismanagement of the revenues. Even in the absence of fiscal mismanagement or poor governance, there can be missed opportunities for leveraging large investments in extractive industries to maximize the development impact of the investments for current and future generations. Moreover, the potential negative environmental impacts caused by mining, transportation, agriculture, and other economic activities are numerous and, without careful environmental management, may be irreversible.

Large multinational mining and oil corporations often invest substantial resources, hoping to be present in the host country for several decades. These investments may require rehabilitated or newly constructed infrastructure—ports, roads, rail, power—all of which can propel broader development when aligned with the infrastructure needs of the host country and communities. The companies will require skilled labor and strong supply chains, and investing early and carefully in vocational training

² "Mozambique: Going for growth," *Mining Journal*, October 29, 2010.

³ *Mining Journal*, 29 Oct 2010

⁴ A. B. Sebitosi and A. da Graca "Cahora Bassa and Tete Province (Mozambique): A Great Potential for an industrial hub in Southern Africa," A. B. Sebitosi and A. da Graca, in *Energy Policy* 37 (2009), pp. 2027-2032.

and business incubators can both increase human capital and decrease operational costs for the company over the long run. Resource processing and beneficiation industries can further multiply the benefits of the original investment by creating local employment and reducing the cost of products to local manufacturers and consumers. The large investors can also be effective partners in addressing and mitigating environmental risks by taking steps both to manage the impacts of the investments and to build resilience in the country to other environmental challenges, especially those stemming from global climate change.

There is currently a vibrant dialogue in Mozambique about the future of the country and how the new mining boom can contribute not only to accelerated growth, but also to better distribution of the growth benefits among the population of the country and the larger SADC region, including by helping to realize the 12% poverty reduction by 2015 envisioned in the PARP.⁵ There is broad recognition that the country is at a pivotal moment. Several megaprojects have been active for some time now, such as Mozal and Sasol. A small number of mining companies are in production, while most are scheduled to begin production in 2011, including Vale and Rio Tinto/Riversdale. Other companies have signed concession agreements and will begin production in the coming years. And numerous exploration activities are proceeding in the country as well. The expectations are high, though the concerns among all stakeholders are numerous as well. At first, the various interests may not seem aligned, and rumors and skepticism proliferate among diverse interests. Transparency, dialogue, and consultative planning can bridge this. Approaching resource-based development comprehensively, such as through the five-pillar approach outlined in this report, can help Mozambique and the region fulfill its development potential.

Vast development needs that can be addressed by a resource-based development strategy

Mozambique is one of the world's poorest countries with an estimated per capita gross national income (GNI) of \$440 in 2009.⁶ Despite impressive economic growth rates (6-8%) and encouraging development progress made by the government in the last decade, poverty continues to be severe and widespread.⁷

Progress towards the Millennium Development Goals (MDGs) has been strong; however, faster progress is needed to achieve them by 2015. The 2008/9 household budget survey, released recently by the Third National Poverty Assessment,⁸ provided evidence of significant progress across a range of non-monetary poverty indicators. There were large improvements in access to education (both primary and secondary); improved access to health services, particularly in rural areas; increases in asset ownership; and improvements in housing quality. At the same time, the 2008/9 measures of poverty based on consumption, particularly food consumption, did not decrease as expected. This was a disappointing and surprising outcome to many who expected the impressive economic growth rates to translate into improved development indicators. For instance, in Tete Province, the influx of investment in the energy and mining sectors, and associated growth in the services sector, have not

⁵ From 54.7% in 2009 to 42% in 2014. (PARP 2010-2014).

⁶ http://devdata.worldbank.org/AAG/moz_aag.pdf

⁷ Ibid.

⁸ Poverty and Wellbeing in Mozambique: Third National Poverty Assessment, National Directorate of Studies and Policy Analysis, Ministry of Planning and Development, September 2010.

substantially improved development indicators; the largely rural population remains impoverished, with poor indicators in education, health, and agricultural productivity.

To leverage the potential of the minerals sector for inclusive growth, South Africa and NEPAD recognized the potential of spatial development planning along several “corridors” that have been identified according to high-rent anchors, such as coal. The Government of Mozambique and the World Bank have adopted the spatial development corridor approach, identifying six spatial development corridors in Mozambique. The goal of the spatial development corridor approach is to leverage the anchor projects for more integrated growth along transport and service corridors, and to ensure that the benefits of the high-rent investments translate into widespread development outcomes. The strategy relies on strong planning mechanisms, including both inter-ministerial coordination to address complex development challenges and also opportunities to coordinate public investments with private investments located along the development corridors, to increase the opportunities for limited resources (both fiscal and infrastructure) to be used effectively, and to take advantage of cross-sector and even cross-border synergies.

This is particularly true for coordinating with national resource investors—and especially the mining companies operating in Tete province—which rely on the Beira and potentially the Nacala corridors for the export of the raw material and therefore have a particular interest in building and upgrading the physical infrastructure as well as investing in the sustainable development of the populations along the corridors. The increased availability of public and private funds and interest along those two corridors has opened up an array of investment possibilities that, if coordinated, planned, and well-governed, provide the basis for unlocking the long-heralded agricultural potential and developing the infrastructure and the workforce, which will enable a shift away from resource-dependence toward economic diversification.

This report aims to implement the African Mining Vision to ensure that the extractive industry investments contribute to economic diversification and long-term sustainable development of Mozambique. The approach of the report is a five-pillar framework for resource-based development, inspired by the African Mining Vision, and discussed in more depth below.

Five-pillar framework for resource-based sustainable development

We have approached the **Zambezi Valley Development Study** with a five-pillar framework for resource-based development to guide our inquiry and recommendations. This framework is underpinned by the premise that responsible, long-term, sustainable investment leads to benefits for both the investors and the residents of the host countries and that sustainability is the mutual responsibility of both investors and governments. The five pillars of the framework are:

- 1) ***Integrated Rural Development and Agriculture Scale-Up***: An integrated strategy for targeted investments in agriculture and rural development, to ensure that communities in the region benefit from the presence of the extractive industries.
- 2) ***Leverage Mining Investments***: Leveraging the extractive industry investments in infrastructure, vocational training, upstream linkages (into mining capital goods and consumables) and downstream linkages (into mineral beneficiation) for national and regional development objectives.
- 3) ***Environmental Protection***: An environmental protection system that allows for multi-

stakeholder management of the cumulative environmental risks and impacts associated with resource investments, their requisite infrastructure investments, and their impact on other regional environmental challenges, such as climate change resilience, water management, or deforestation.

- 4) ***Long-term Planning and Revenue Management.*** An effective government strategy and capacity for leveraging the investments and for managing resource revenues, including national development planning, effective budgetary mechanisms and execution, and strategic allocation of resource revenues.
- 5) ***Transparent and Mutually Beneficial Legal Framework.*** A transparent, legal framework for extractive investments, mutually beneficial to industry and the host country, that is implemented and monitored by strong governmental and societal institutions with the cooperation of industry.

These five pillars aim to integrate the roles, responsibilities, and opportunities for governments, private sector, development partners, NGOs, and academia. The framework recognizes the value of an integrated approach to development—including infrastructure, business development, agriculture, health and environment—and identifies the entry-point for how natural resource assets can be leveraged for such an integrated approach to development. The framework covers all stages of the value-chain of natural resource extraction, from exploration, through contracting and contract implementation, to revenue collection, management, and spending.

The chapters of this report follow each pillar, highlighting the specific opportunities in Mozambique for multi-stakeholder collaboration. They seek to highlight the roles that extractive companies, governments, communities, development partners, and civil society can play, and very often they stress the need for multi-stakeholder coordination to ensure mutually beneficial outcomes for industry and communities. While each stakeholder may be guided by different philosophies, goals, and objectives, there is a shared vision of economic development and broad-based and equitable prosperity. The question is how to get there. The chapters identify concrete actions and opportunities to realize this shared vision.

Methodology

a. Senior guidance

The project has been supervised by Dr. Jeffrey D. Sachs, Director of the Earth Institute at Columbia University. Dr. Sachs provided strategic direction and overall support to the project. He is personally familiar with the region and its development challenges, and has worked very closely over the years with the political leadership in Mozambique, Malawi, and Zambia, as well as with other governments throughout the African continent. The project also greatly benefited from the guidance of Dr. Glenn Denning, Professor of Professional Practice at Columbia University's School of International and Public Affairs and Director of the Earth Institute Center for Globalization and Sustainable Development. Until recently, Dr. Denning was the Director of the Earth Institute's Millennium Development Goals (MDG) Centre in Nairobi, which he helped found. Dr. Denning has more than 30 years of experience in agriculture and rural development, including throughout the African continent.

b. Criteria for observations and recommendations

The VCC has approached the Zambezi Valley Development Study with the five-pillar framework as guidance for our inquiry and recommendations. This report applies the five-pillar approach in a specific regional context, the Zambezi Valley, looking at the implications for Mozambique, private-sector investors (especially the mining sector), development partners (including regional development banks and international donors), local institutions including universities, national and international NGOs, and local communities. Therefore, the observations and recommendations throughout the chapters of this report track the Five Pillars discussed above and integrate the roles, responsibilities, and opportunities of each of the stakeholders.

This report does not aim at comprehensiveness, but rather the recommendations presented are those that the VCC considers would:

- 1) address a critical need,
- 2) benefit from more coordinated attention and pooled resources, and
- 3) encourage and deepen multi-stakeholder partnerships.

The report is issue-based and solution oriented. It brings comparative international practices and analyzes their applicability in the context of Mozambique. It focuses on positive opportunities for development through collaboration and innovation.

Importantly, this report does not address several fundamental issues related to extractive industries and sustainable development, including human rights, gender issues, resettlement, land rights, artisanal mining, and specific environmental disruptions of mining and infrastructure. Nor does this report focus on mine-site development opportunities or CSR programs. This omission does not lessen the need for best practices and sustainable development at the mine site, nor for the consideration of other critical aspects of sustainable development. These issues are critical and should be considered by all stakeholders as integral to development planning.

This report also does not directly address the growing hydrocarbon sector. It is particularly pressing to incorporate this new sector into the national and regional development strategy. Although many of the concepts discussed in this report are relevant for the hydrocarbon sector, there are unique characteristics of the sector that could be usefully considered in the development context that are not addressed in this report.

Instead, the guiding premise of the report is that it is important to consider the regional impact and potential of resource-based development, which receives comparatively less attention, especially in a holistic framework that recognizes the interconnectedness of various sectors of the economy and public and private partners. That is the focus of this report, though we hope that the discussions that follow incorporate those aspects of development not specifically addressed herein.

c. Sources of information

Our information is based on extensive desk research and field research in the region during 2009-2011, including extensive meetings with government, industry, and local partners. From the central Government, the report benefited from meetings with the Ministries of Mineral Resources, Finance,

Planning, Science and Technology, Transportation and Communications, and Agriculture, as well as with the President's office. In Tete Province, we met with the Provincial Directorates of Energy and Mineral Resources, Public Works, Agriculture, and Education. We also met with several public agencies, including CPI, GPZ,⁹ and EDM.

From the business community, the report benefited from meetings with Vale, Riversdale, Rio Tinto, Mozal, Kenmare Mining, Banco Terra, ABC Bank, BCI, BOM, ProCredit, Standard Bank, Servo Catering Mozambique, CTA, ACIS, Finantia Consulting, and Yara. We also met with representatives of the Beira Agricultural Growth Corridor, a public-private initiative.

From the donors and technical assistance community, we met with the World Bank, IFC, the African Development Bank, the UN Country Team, the European Union delegation, DFID, USAID, MCA, MCC, Norway Embassy, Danida, GIZ, the Italian and Canadian Cooperation, ADIPSA,¹⁰ Technoserve, and AGRA.

We also met with several non-governmental organizations, including Africare, CPI, WWF, WorldVision, Village Reach, Care for Life, the Mozambican Debt Group, SEDE,¹¹ FDC,¹² and PSI.¹³

From Academia and research institutes, we met with the Rector and several professors of the University Eduardo Mondlane, and with the IESE, IRRI,¹⁴ and IFDC.

From the community of international experts who have worked with several countries to put in place resource-based development policies, we met with Paul Jourdan, Jeff Wood, James Otto, David Perkins, and Bo Giersing.

Finally, we met with many other individuals and groups from other resource-rich countries to provide comparative perspective. We also met with stakeholders in Malawi (government officials, development partners, and civil society) to understand the shared interests, challenges, and opportunities along the Nacala corridor.

We are deeply grateful for the insights and cooperation of all of these partners, and inspired by the immeasurable level of commitment to and confidence in the development of the Zambezi Valley.

d. Why this report? Why the Lower Zambezi Valley?

While visiting Vale's mine site at Moatize and hearing about the company's regional infrastructure plans, Dr. Sachs suggested that the Moatize mine could be a game-changer if the public and private sector embraced an ambitious sustainable resource-based development strategy. At Dr. Sachs' suggestion, Vale agreed to fund a study that would lead to this strategy. This report does not focus on Vale's mine, nor does it address or comment on Vale's corporate social responsibility policy in

⁹ Zambezi Valley Planning Office.

¹⁰ ADIPSA, Apoio ao Desenvolvimento de Iniciativas Privadas no Sector Agrário, is a Danish-funded agriculture business development provider.

¹¹ Saúde e Desenvolvimento Empresarial.

¹² Community Development Foundation.

¹³ Population Services International.

¹⁴ International Rice Research Institute.

Mozambique or elsewhere. Although not addressed in this report, the VCC unequivocally believes that, *at minimum*, Vale and all other extractive industry companies should adhere to international law, host country law, and best practices in these areas; host governments and civil society should rigorously monitor and enforce these practices. Beyond these *de minimus* requirements, there are opportunities for companies to set higher standards as corporate citizens and development partners through their business practices and community engagements; though not discussed in this report, these aspects of a company's engagement at the mine site are integrally important to local development and to a company's social license to operate.

The purpose of the report is to propose multi-stakeholder opportunities to implement a development strategy, taking as a premise that sustainable development is in the shared interest of all stakeholders and is therefore a shared responsibility. Our hope is that the Government will lead the implementation of the recommendations, and that Vale, as one of the largest investors in Mozambique, will be a catalyst towards the implementation of some of the recommendations, working in close coordination with other investors, the donor community, neighboring countries, non-governmental organizations, and most importantly, Mozambique's citizens. We also hope that this report will be useful as a model for other regional resource-based development strategies.

e. Next steps

This first draft is the basis for discussion and consultation with the Government of Mozambique, Vale and all stakeholders in Mozambique and the region that we are hoping will continue to collaborate constructively to help implement the recommendations. In order to support the coordination of the stakeholders and the implementation of key initiatives, the report suggests the establishment of a Zambezi Valley Resource-Based Development Coordinator, an international Resource-Based Development Advisory Group, and a Zambezi Valley Resource Policy Forum. Each of these and the roles they could play are described in the conclusion. The VCC, The Earth Institute, Columbia Law School and the broader Columbia University community—all of which have contributed tremendously to this report—look forward to supporting these processes and our regional partners on an ongoing basis.

Chapter One: Integrated Rural Development in the Zambezi Valley

Introduction

In 1910, R. C. F. Maugham, consul for Portuguese East Africa, wrote, “I am convinced that the future of Zambezia depends on the development of its agriculture, and that although doubtless valuable mineral resources exist, they will only form a weak second line in the movement that will sweep this district.”¹⁵ One hundred years later, the global demand for energy has projected coal mining to prominence with the promise of vast revenues derived from investments in Tete Province. Together with Mozambique’s other mineral and energy resources, the increased availability of public and private funds has opened up an array of investment possibilities that may, ironically, provide the basis for unlocking the long-heralded agricultural potential of the Zambezi Valley.

This chapter discusses both the need and potential for investing in integrated rural development in the Zambezi Valley. In the context of this report, “integrated rural development” refers to sustainable multi-sectoral investments that address the specific needs and conditions of the rural communities living in the regions affected by the Zambezi Valley mining investments (including along transportation corridors). In the Zambezi Valley, this geographic scope includes all rural communities living in and between resource-rich Tete Province and the Nacala and Beira ports (i.e., along the Nacala and Beira corridors, respectively). Our goal is to maximize and expand the sustainable development impact of the large extractive investments in Tete Province along the two development corridors and even beyond.

Low-income rural communities along the Beira and Nacala corridors comprise about 80% of the population. Farming is the main source of food and income for most households; however, agricultural productivity remains very low. Therefore, this chapter focuses on opportunities for advancing *smallholder* agriculture, rather than the large-scale commercial estates.¹⁶ The latter are considered only in the context of the potential for implementing and strengthening out-grower schemes that could benefit smallholders. By focusing investments on smallholder agriculture, the dual objectives of food security and poverty reduction can be tackled for a large section of the population. Such investments are critical for enabling a more equitable sharing of benefits from extractive industries.

After providing an overview of the specific needs and conditions of the communities along the Beira and Nacala corridors, this chapter explores practical investment opportunities to inclusive and diversified agriculture-led growth along the corridors, envisioning that its benefits will be spread beyond Mozambique to the entire Zambezi Valley.¹⁷

¹⁵ Maugham, R.C.F. (1910) Zambezia : a general description of the valley of the Zambezi River, from its delta to the River Aroangwa, with its history, agriculture, flora, fauna, and ethnography. <http://www.archive.org/details/cu31924028621641>

¹⁶ Of the 1.5 million hectares of land under production in Mozambique, more than 98% is cultivated by smallholders.

¹⁷ As the Nacala corridor crosses through Malawi, consideration of southern Malawi is included in our analysis. In general, we propose closer collaboration between Mozambique and Malawi in implementing and assessing integrated rural development programs, given the mutual benefits of regional development and the shared agro-ecological profiles in the Zambezi Valley region.

1. Poverty along the Beira and Nacala corridors

Despite impressive national economic growth rates (6-8%) and encouraging development progress made by Mozambican Government in recent years, poverty continues to be severe and widespread in the Zambezi Valley (See Table 1).¹⁸

Mozambique's 2008/09 household budget survey (known as IOF08¹⁹) provided evidence of significant progress across a range of non-monetary poverty indicators. There were large improvements in access to education (both primary and secondary); access to health services was improved, particularly in rural areas; asset ownership increased; and housing quality improved. However, the 2008/09 measures of poverty based on consumption, particularly food consumption, did not decrease significantly. While consumption poverty fell significantly from 1996/07 to 2002/03, the IOF08 showed that consumption poverty at the national level stagnated at about 55% of the population.²⁰ This was indeed a disappointing outcome that highlighted the challenge of achieving more inclusive and equitable growth in Mozambique.

National statistics, though informative, hide distinct regional patterns of change in poverty levels (Table 2). While the rural poverty rate worsened in the Zambezi Valley, it declined in the northern regions over the same period. Indeed, rural northern regions of the country showed the largest decreases in poverty: from 59% to 46% between 2002 and 2008. In the central region, corresponding in part with the Beira corridor, poverty surprisingly *increased* from 46% to 60%, in particular, in Manica, Sofala, and Zambezia provinces. In contrast, Tete province saw a decline in poverty from 60% to 42%.²¹ This is likely attributable to the economic growth associated with recent mining investments and its impact on service industries and employment in Tete town.

¹⁸ Per capita gross national income (GNI) was \$440 in 2009. In Malawi, per capita GNI was \$280 in the same year.

¹⁹ Inquérito ao Orçamento Familiar 2008/09

²⁰ Adapted from the IFAD Rural Poverty Portal:

<http://www.ruralpovertyportal.org/web/guest/country/home/tags/mozambique> and the Third National Poverty Assessment (September 2010):

http://aec.msu.edu/%5C/fs2/mozambique/caadp/THIRD_NATIONAL_POVERTY_ASSESSMENT_october1.pdf

²¹ Adapted from the IFAD Rural Poverty Portal:

<http://www.ruralpovertyportal.org/web/guest/country/home/tags/mozambique> and the Third National Poverty Assessment (September 2010):

http://aec.msu.edu/%5C/fs2/mozambique/caadp/THIRD_NATIONAL_POVERTY_ASSESSMENT_october1.pdf

Table 1. Snapshot of key poverty, agriculture, and nutrition indicators in the Beira and Nacala corridors²²

Key sectors	Beira Corridor (Central Region)	Nacala Corridor (Northern Region)	National
Poverty	Central region poverty increased from 45% to 60% from 2002 to 2008, in particular, in Manica, Sofala, and Zambezia	Rural northern region showed the largest falls in poverty, from 59% to 46% from 2002 to 2008	55% in 2008/09, compared with 54% in 2002/03 ²³
Agricultural productivity	From 2003 to 2008, per capita food crop production declined by: <ul style="list-style-type: none"> • 32% in Sofala • 19% in Zambezia²⁴ Average maize yield is less than 1 ton/ha	Agricultural performance in the northern provinces was better than in the central provinces; the northern provinces benefited from gains in access to public services and infrastructure, and a more stable and higher rainfall in recent years	
Malnutrition (among under-five) ²⁵	<ul style="list-style-type: none"> • 50% stunted (chronic malnutrition) • 21% underweight • 7% wasted (acute malnutrition) 	<ul style="list-style-type: none"> • 57% stunted (chronic malnutrition) • 23% underweight • 8% wasted (acute malnutrition) 	<ul style="list-style-type: none"> • 46% stunted (chronic malnutrition) • 19% underweight • 7% wasted (acute malnutrition)
Under-five mortality rate	152/1000 (Tete: 174/1000)	156/1000	138/1000
HIV/AIDS Infection rate among women 15-49 ²⁶	14% (Tete: 8%)	4%	13%
Access to improved water source	38% (Tete: 34%)	43%	41%
Access to sanitation	15% (Tete: 3.5%)	15%	20%
Primary School: Net Attendance Rate	79% (Tete: 69%)	76%	81.3%
Primary School: Net Completion Rate	10% (Tete: 5.5%)	8%	15%
Access to the power grid ²⁷	7% (Tete: 5%)	6%	14%

²² Mozambique: Multiple Indicator Cluster Survey, 2008; Third National Poverty Assessment.

²³ The increase was not statistically significant.

²⁴ Such a fall in production and low productivity is likely due to more severe climatic shocks in these regions as well as lowest rates of access to inputs. In 2007 and 2008, flooding in the Zambezi river basin and rising water levels on the Búzi, Púngue, Save and Licungo rivers were so massive that the government declared red alert.

²⁵ Poor nutrition increases children's susceptibility to infectious illness and also reduces their cognitive potential, both of which have implications for the development of a healthy and productive workforce.

²⁶ 2009 Rates from INSIDA <http://www.measuredhs.com/pubs/pdf/SR179/SR179.pdf>

²⁷ Cuvilas CA, et al. Energy situation in Mozambique: A review. *Renew Sustain Energy Rev* (2010), doi:10.1016/j.rser.2010.02.002

Table 2. Poverty headcount trends at national, regional, and provincial levels

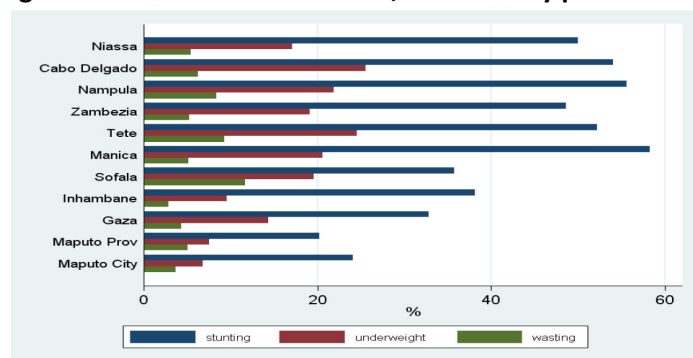
	1996-97	Levels, %		Difference, % points	
		2002-03	2008-09	1996-97 to 2002-03	2002-03 to 2008-09
National	69.4	54.1	54.7	-15.3	0.6
Urban	62	51.5	49.6	-10.5	-1.9
Rural	71.3	55.3	56.9	-16	1.6
North	66.3	55.3	46.5	-11	-8.8
Center	73.8	45.5	59.7	-28.3	14.2
South	65.8	66.5	56.9	0.7	-9.6
Niassa	70.6	52.1	31.9	-18.5	-20.2
Cabo Delgado	57.4	63.2	37.4	5.8	-25.8
Nampula	68.9	52.6	54.7	-16.3	2.1
Zambezia	68.1	44.6	70.5	-23.5	25.9
Tete	82.3	59.8	42.0	-22.5	-17.8
Manica	62.6	43.6	55.1	-19	11.5
Sofala	87.9	36.1	58.0	-51.8	21.9
Inhambane	82.6	80.7	57.9	-1.9	-22.8
Gaza	64.6	60.1	62.5	-4.5	2.4
Maputo Province	65.6	69.3	67.5	3.7	-1.8
Maputo City	47.8	53.6	36.2	5.8	-17.4
<i>Dispersion:</i>					
Provinces	11.7	12.6	13.2	17.2	18.3
<i>Correlation coefficients:</i>					
Consecutive surveys		-0.001	-0.006		-0.633
Initial level and change	-0.683	-0.668			
Destination level and change		0.731	0.726		

Notes: Dispersion of the poverty rates and changes in poverty rates is measured by the standard deviation of the provincial rates and changes in rates across provinces. The correlation coefficient for consecutive surveys shows the correlations for each column with the preceding column. Initial level and change shows the correlation starting with the first levels column and the first rates column. Destination level and change shows correlations starting with the second levels column and the first rates column. All correlations are performed on province

Source: MPD/DNEAP based on IOF08, IAF02, IAF96.

Malnutrition levels have stagnated at the national level since 2002/03 and are particularly high along the Beira and Nacala corridors (see Figure 1).

Figure 1. Moderate malnutrition, % infants by province



Sources: MPD/DNEAP using IOF08

This reflects low agricultural productivity due to inadequate rural transportation and energy infrastructure, coupled with the lack of access to education, clean water and sanitation, and basic health services.

The infrastructure, health, and education constraints are similar in southern Malawi, which shares some of the agro-economic characteristics of northern and central Mozambique. Southern Malawi is one of the most impoverished regions of Africa; unlike the sparsely populated northern provinces of Mozambique, southern Malawi is very densely populated, and an additional constraint to agricultural productivity is lack of access to land. Typically, the most vulnerable households have less than 0.5 hectares of land to cultivate.

Like Mozambique, over 80% of the population in southern Malawi is engaged in agriculture, which is subject to rainfall variability that can be particularly damaging when there are short dry spells. This can lead to household food shortages for up to 9 months of the year. Despite tremendous progress made since 2006 in levels of food insecurity thanks to a national fertilizer subsidy, poverty remains in much of rural Malawi, and is most severe in the southern region of the country. Chronic malnutrition, the HIV/AIDS epidemic, substandard health services, and lack of clean drinking water have kept average life expectancy in Malawi low (54 years in 2009).

In conclusion, the body of recent evidence indicates that progress towards reducing rural poverty and malnutrition has stagnated in the Zambezi Valley, along both the Beira and Nacala corridors. This reflects generally slow progress in improving agricultural productivity and wider lack of access to education and health services. Inadequate rural infrastructure, both roads and electrification, hamper improvements in agriculture, while poor access to clean drinking water and sanitation affect food utilization. To make progress in reducing rural poverty and malnutrition, it is therefore imperative to employ an integrated multi-sectoral approach to development. At the core of this approach should be public and private investments to achieve inclusive and diversified agriculture-led economic growth in the Beira and Nacala corridors. Through such investment, the transition from subsistence to commercial agriculture can be hastened as outlined in the following section.

2. Smallholder agriculture: an engine of growth and poverty reduction²⁸

Agricultural productivity improvements have been a major driving force of social and economic change in human societies for millennia. The traditional production of crops and livestock has fulfilled household requirements for food, fiber, fuel, medicine, and other essential consumables. Surpluses and the income derived from them opened up opportunities for specialized roles for producers, processors, and traders of agricultural products, spreading benefits beyond farmers to the broader society. This evolution from subsistence to market-oriented commercial agriculture provided the foundation of a structural transformation: a dynamic process that ultimately leads to a relative decline of the agriculture sector and to a more diversified and productive economy dominated by manufacturing and services as observed throughout Europe, North America, and Japan, and more recently emerging in China and India.

The most compelling evidence of agriculture-led poverty reduction and food security comes from Asia. During the past four decades, the region experienced unprecedented economic growth and structural transformation. Poverty declined from 50% in the 1970s to 18% in 2004, while hunger declined from 30% to 16% over the same period.

These successes are attributed largely to improved agricultural productivity as a consequence of technological change, market liberalization, and infrastructure investments – the Green Revolution. By combining modern agricultural science, sound policies, and political leadership, global average yields of Asia's staples, rice and wheat, more than doubled. Hundreds of millions of small-scale farmers made

²⁸ Adapted from Denning, G. (2007). Agriculture leads to the MDGs: Rural development in Africa. *UN Chronicle* No. 4, available at: <http://www.un.org/wcm/content/site/chronicle/cache/bypass/home/archive/issues2007/themdgareweontrack/agricultureleadstothemdgsruraldevelopmentinafrica?>

the transition from subsistence to commercial agriculture. These results of investment in smallholder agriculture provided a foundation for unprecedented economic growth in Asia.

In contrast, agricultural productivity growth in sub-Saharan Africa has not kept pace with population growth. The per capita growth rate of agricultural gross domestic product was negative during the 1980s and 1990s, though improvements have been noted since 2000. Production growth of the major African (and Mozambican) food crops (maize and root crops), was based almost entirely on extending the cultivated area, with only minor contributions from yield growth. Poor infrastructure and related high transport costs (for both inputs and surplus production), inadequate institutional support (credit and extension), political instability, diverse agro-ecological complexities, low fertilizer use, and the limited availability of suitable high-yielding varieties have all contributed to low agricultural productivity growth in Africa. These circumstances were present in Mozambique, but exacerbated by civil war and social disruption.

The good news is that chronic hunger in Africa, and specifically in Mozambique, can be ended within a few years with targeted investments based on our current knowledge. This was the unanimous conclusion of several recent expert reports, including those of the UN Millennium Project (2006), the Irish Hunger Task Force (2008), an independent advisory group to the Madrid Conference on Food Security (2009), and the UN High Level Task Force on the Global Food Crisis (2008–10). These reports, representing the analyses and conclusions of hundreds of scientists, practitioners, and policy experts from international organizations, governments, civil society organizations, and the private sector, concluded that small-scale farmers hold the key to ending hunger. The lessons from Asia and the adaptation of the Green Revolution to Africa, as recently illustrated in Malawi, can be applied successfully in Mozambique with full expectation of similar advances in food security and poverty reduction. Unlocking the potential of smallholder agriculture will, however, necessitate increased budgetary outlays to agriculture as well as complementary and targeted private investments.

2.1 Scaling-up current and planned support to smallholder agriculture

The Mozambican Government has been implementing a series of policies, strategies, and programs with the purpose of combating poverty, achieving food security, and promoting sustainable development. The framework is built on the guidelines contained in eight key documents: the Agricultural Policy and Implementation Strategy (PAEI); the Poverty Reduction Action Plan (PARP 2010-2014); the 5-Year Government Program 2010-2014; the Green Revolution Strategy; the Food Production Action Plan (PAPA); the Rural Development Strategy (EDR); the Food and Nutritional Security Strategy (ESAN), and the Strategic Plan for Agricultural Development (PEDSA 2010-19).

Public expenditure for agriculture in 2007 amounted to 4.6 percent of total expenditure. In spite of the plans to increase public spending to boost cereal production, the percentage of agriculture expenditure against the budget total remains small. If Mozambique were to comply with the declared African Union (AU) target of 10% of total budget expenditure toward agriculture, public expenditure in agriculture and fisheries would need to almost double.²⁹

²⁹ World Bank (2011) Mozambique Analysis of Public Expenditure in Agriculture. Vol 1: Core Analysis. WB Report No. 59918-MZ

2.2 Coordinated investments to unlock small-holder agriculture

The World Bank Analysis of Public Expenditure in Agriculture also identified the need for improved “quality” of spending, particularly if public spending in agriculture is to be increased. Quality refers to the mix of public and private goods, but also to the relation between spending on agriculture and expenditure on complementary public services such as roads, storage facilities, markets, and rural finance. Thus, a more holistic value-chain approach is needed. This in turn requires a more coordinated approach to smallholder agricultural development that involves relevant government ministries (agriculture, health, education, infrastructure, commerce, environment, and trade), the private sector (international, national, and local), NGOs, and donors.

Specifically, in order to raise smallholder productivity, complementary public and private investments are required in the following areas:

1. Rural infrastructure: rural roads, electrification, and expanded ICT access
2. Credit: new institutions and new credit products that benefit smallholders
3. Research: introduction and adaptation of new technologies
4. Extension advice and training: increasing modern ICT applications
5. Access to inputs: targeted smart subsidy programs for seed and fertilizer³⁰
6. Access to improved weather and climate information
7. Irrigation: expanded investment to improve yield and income stability³¹
8. Appropriate mechanization of tillage, weeding, harvesting, and post-harvest processes to improve labor productivity
9. Market information: access to current prices and market opportunities
10. SMEs that serve smallholders (such as seed producers and agro-dealers)
11. Storage facilities and innovative mechanisms aimed at reducing post-harvest losses
12. Financial risk transfer mechanisms, including weather-based index insurance
13. Nutrition improvements based on increased biodiversity and biofortification
14. Business support for development of farmer associations, cooperatives, and out-grower schemes where appropriate
15. Policy dialogue and changes to reduce the transaction costs of cross-border trade
16. Complementary investments in health, education, safe water supply, and improved sanitation

The following sections elaborate on several of these priority areas, focusing especially on the first five, and on the role of complementary investments in other sectors (number 16, above). A new Zambezi Valley Agri-Business Alliance (section 3.5) and pilot projects in integrated rural development (section 4) could help facilitate these public-private and multi-sectoral investments in the Zambezi Valley region. Chapter 2 describes how coordinated investments in electrification, rail, and ICT can further unlock the productive base, and Chapter 3 explores opportunities to increase the climate resilience of agricultural development.

³⁰ Adapting and learning from experience from Malawi, Tanzania, and others that have implemented subsidy programs over the past several years.

³¹ Despite recent progress, the area under irrigation in Mozambique is only 62,000 ha, which is only 2% of the estimated potential. On March 18, 2011, the World Bank announced an IDA credit of \$70 million to support irrigation development in the three central provinces of Manica, Sofala, and Zambezia.

3. Improving smallholder productivity

There is already strong interest from the Government, donors, and private investors to commercialize agriculture in Mozambique, especially along the Beira and Nacala corridors. But much of the focus appears to be on higher-value commercial commodities that show greatest potential for export. More attention needs to be given to the food security needs of smallholders who remain disconnected from the markets. Without investment in market access (including rural roads), rural finance, and improved technologies, the benefits of the progress agricultural growth may be limited to a relatively small number of producers with easier access to markets, infrastructure, and inputs.

3.1 Improving access to markets through feeder roads

The northern provinces of Mozambique are the most densely rural populated provinces, yet have the lowest share (33-35%)³² of the population within 2 km from any all-weather road. Preliminary estimates of the World Bank suggest that the existing road network could provide potential access (measured as those living within 2km of any road in the network) to around 41% of the nation's rural population. However, because of the poor condition of the network, which is impassible in the rainy season, the percentage of the rural population that has reliable, all-year access is much smaller: 11% according to 2007 estimates.³³

Tertiary and vicinal roads are not asphalted and benefit from much less public and donor support than the main national road network. Trunk road infrastructure, as well as feeder roads, connecting villages to the main road network, have significant bearing on transport costs; the poor road network raises the costs of production and distribution, reduces the profit margin on produce sales, and limits production yields to levels below their potential, impeding the transition from subsistence to income-producing agriculture. For households facing transport costs of about \$75 per ton, their non-farm earnings would increase by 50%³⁴ if rural roads were constructed. Therefore, for poor remote households, investing in rural roads can have desirable income and equity effects.

A high priority should be to identify the most fertile regions³⁵ for phased financing and construction of feeder roads. For instance, such a strategy could prioritize feeder roads in the highly productive areas of Tsangano, Macanga, Chifunde, and Angonia districts (along Road 223) of Tete province, which remain largely underutilized, partly as a result of their inaccessibility to the main road network. Investing in rural roads in Tete province may be particularly important in light of the extractive industry investments; the increased demand from these investments has the potential to escalate food prices in the region. This pressure on prices can be alleviated by public and private investments in agricultural productivity in the region, including by expanding the feeder road network, thereby increasing access to markets to the rural high-producing areas. Moreover, the feeder roads, connecting to the regional trunk infrastructure, will also increase access to the planned rail investments, which would further unlock the agribusiness potential of the region and more extensive access to both inputs and markets (see Chapter 2).

³² Uwe Deichmann, Use of GIS in Road Sector Analysis, DECRG, Transport Forum and Learning Week 2007, Transport Measurement Matters: Indicators of Performance and Impact, March 30, 2007.

³³ 2007 World Bank Proposal for Roads and Bridges Phase 2

³⁴ Jacoby, Hanan G. & Minten, Bart, 2008. "On measuring the benefits of lower transport costs," Policy Research Working Paper Series 4484, The World Bank

³⁵ The World Bank identified the following feeder roads along the Nacala Corridor: Angoche–Liupo–Monapo–Nacala; Lumbo–Matibane–Nacala; Namialo–Nacarua–Namapa–Pemba; Marrupa–Pemba; Mecula–Marrupa–Maua–Metarica; Nipepe–Marrupa. (Project Appraisal Document for Spatial Development Planning Development Assistance)

In addition to increased budgetary outlays for rural infrastructure, which generates substantial returns in terms of productivity, income generation, and poverty alleviation, other development partners could usefully collaborate on expanding the infrastructure grid in highly fertile areas to increase access to markets. There are also examples of programs that hire local communities for basic construction work, which has the added benefit of skill-building and local employment.³⁶

3.2 Improving access to rural finance

In addition to expanding the road network and improving access to markets, scaled-up rural finance is similarly important in increasing input use for agricultural productivity improvement. Rural finance can also be deployed to promote diversification towards higher-value crops as well as to enhance product quality through post-harvest improvements.

Microfinance has traditionally been concentrated in urban areas, and the products have not catered to the needs and realities of rural agricultural communities. However, several commercial microfinance institutions such as NovoBanco, SOCREMO and BOM, and Accumulative Savings and Credit Association (AKSM and ADEM, Amoder) are looking to increase their coverage in rural areas. It is likely that, at first, commercial products in rural areas will target “traders and farmers with sufficient guarantees and/or belonging to out-grower schemes,”³⁷ rather than targeting smallholders. A survey undertaken by the Mozambique Microfinance Facility and the UNDP in 2006 cautioned that rural finance for smallholders was only realistic for the foreseeable future through the subsidization of operational costs, including by donors.³⁸

Strengthening and replicating initiatives such as Gabinete de Consultoria e Apoio à Pequena Indústria (GAPI) could have a major impact on increasing access to finance for rural farmers. GAPI is a medium-sized Mozambican non-bank financial institution that has been at the center of various successful initiatives of industrial development in rural areas. GAPI mainly relies on lines of credits obtained from five lending agencies (KfW, USAID, Nordic Development Fund, The African Development Fund, and PODE,³⁹ a World Bank project) and other donors (like the European Union, Danida, Ford Foundation, and others) who not only provide further finance for credit operations, but also fund GAPI’s related activities in business development services, training, and technical assistance for small farmers, retrenched workers, and others.

The Alliance for a Green Revolution in Africa (AGRA) is promoting smallholder financing through loan guarantees to reduce lending risks of banks. AGRA and its partners have leveraged \$160 million in affordable loans to commercial banks in Kenya, Uganda, Tanzania, Ghana, and Mozambique. Through this initiative, low-interest loans are made available to associations of smallholder farmers, agro-dealers, and SMEs that support smallholder agriculture. They support the entire value chain from farm production, to seed companies, to post-harvest operations and to trade in inputs and produce.

³⁶ For example, the International Labor Organization is working in Timor-Leste with the Ministry of Vocational Training and Employment on a project engaging the community to improve the country’s road network.
www.irinnews.org/Report.aspx?ReportID=91149

³⁷ Mozambique Microfinance Facility (MMF) and the United Nations Development Programme (UNDP), *Microfinance in Mozambique: Achievements, Prospects & Challenges*, June 2006

³⁸ *Ibid*

³⁹ World Bank Project for Entrepreneurial Development

Standard Bank (Africa's largest bank) and Equity Bank (Kenya's largest bank) have contributed \$150 million to this innovative financing initiative. An AGRA initiative partnering with the Central Bank of Nigeria will deploy \$500 million to leverage \$3 billion from commercial banks into Nigerian agriculture. In Mozambique, a fund of \$2.5 million is being established by AGRA and the Millennium Challenge Account Mozambique. Once implemented and evaluated, this program has the potential to be scaled up throughout the Zambezi Valley drawing on the experience of Nigeria.

When providing financing for smallholder rain-fed agriculture, the threat of crop failure can make opportunities less attractive for all parties. A solution that has been evolving in recent years is the use of index-based weather insurance. In these schemes, an insurance contract is structured based on a weather-related index (such as amount of rainfall). By linking crop production with the weather index, farmers (or governments) receive a payout if the index suggests that crop production will fall significantly below an agreed upon amount. The time lag between a weather/climate shock and payout in index insurance is far less than in traditional crop insurance schemes. Bundling index-based weather insurance with microfinance instruments offers the possibility for smoothing risk and increasing financial benefits. The private sector, donors, NGOs, and research institutes are already working with governments in Africa and Asia on index insurance solutions. For example, the Earth Institute, the World Bank's Commodity Risk Management Group, Oxfam America, and Swiss Re have all supported projects in Eastern Africa (including Malawi and Ethiopia).

3.3 Establishment of a Zambezi Valley Agricultural Development Center

Spending on agricultural research (excluding research in fisheries) amounts to slightly below US\$6 million (MT140 million) per year, about 4.1 percent of recorded agriculture and fisheries public spending in Mozambique.⁴⁰ Excluding large-scale irrigation projects and the local investment funds, agricultural research still amounts to only 6 percent of public spending in the sector. Research expenditure represents only 0.24 percent of agriculture's contribution to GDP.

The World Bank public expenditure report notes that the PAPA provisions for research are not likely to significantly change the spending on agriculture research.⁴¹ Although the PAPA makes provision for additional funds for agricultural research for each of the crops that it addresses, research expenditure is highly concentrated on two crops: rice and Irish potatoes.

With growing interest of the Mozambican Government in a Green Revolution, and the increased interest of donors to support smallholder agriculture (e.g., the L'Aquila G8 Meeting and GAFSP⁴²), there is an urgent need to establish a Center capable of undertaking smallholder-focused adaptive research (including climate risk management), seed multiplication, extension, and training throughout the Zambezi region. With headquarters in Tete province, the Center would operate in a decentralized agro-climatic or agro-ecosystem-based manner through existing government facilities in the region and would draw on the research undertaken at the zonal research centers in Sussungenda, Lichinga, and Nampula (see Map 1).

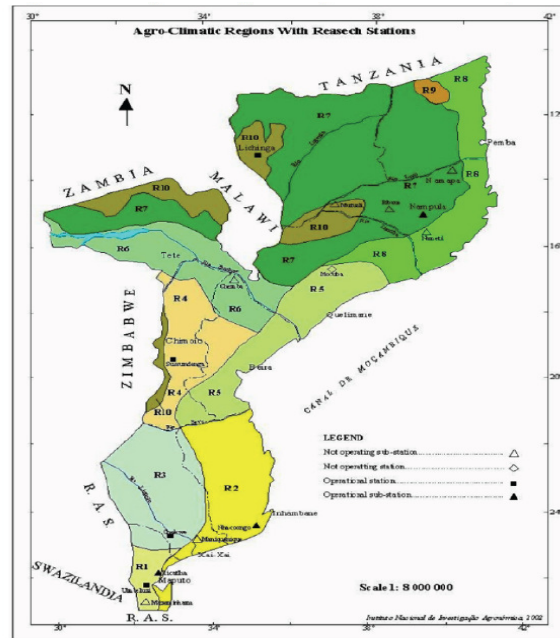
⁴⁰ World Bank, Mozambique Analysis of Public Expenditure in Agriculture. Vol 1: Core Analysis. WB Report No. 59918, 2011.

⁴¹ Ibid.

⁴² Global Agriculture and Food Security Program. See <http://www.gafspfund.org/gafsp/content/global-agriculture-and-food-security-program>

Map 1. Main Agro-climatic Regions and Agricultural Research Stations, 2002

The Center, to be led by the Mozambique Ministry of Agriculture, would seek a wide range of public and private-sector partnerships and sponsorships including with the Consultative Group on International Agricultural Research (CGIAR), the Alliance for a Green Revolution in Africa (AGRA), and private-sector firms. The location in Tete fills a gap in the national research center network⁴³ and also provides a direct and visible focus for support by the extractive industries and related services that are located in Tete Province. In addition, with the support of additional partners in the region, this Center would be well positioned to meet the criteria for support from the Global Agriculture and Food Security Program (GAFSP).



Source: Instituto Nacional de Investigação Agronómica.

3.3 Increasing access to agricultural inputs

Currently Mozambique’s fertilizer use is 4 kg/ha, less than the average on the continent of 10 kg/ha, and far below the 50 kg/ha objective set by African governments at the African Fertilizer Summit held in Abuja in 2006.⁴⁴ Lower fertilizer use is a major constraint to development, keeping productivity and yields low, thereby limiting profit (and the means of purchasing additional inputs).

Mozambique does not currently provide generalized subsidies on agricultural inputs, as some neighboring countries do. But the situation is anticipated to change in view of the targets of the PAPA, where the provision of subsidized inputs, particularly of seeds and fertilizer, is planned in order to accelerate the adoption of modern technologies.

Indeed, there is considerable untapped potential for increased production through improvements in land and labor productivity. Cereal production per rural capita has remained essentially steady over the past 10 years, while use of improved technologies (chemical fertilizers, pesticides, animal or motorized traction, and irrigation) remained below regional averages.

Mozambique is in an excellent position to adopt a voucher-based input subsidy program that draws lessons from the experience of its neighbors, particularly Malawi and Tanzania. In fact, the United Nations’ FAO recently awarded a grant to IFDC to assist the Government of Mozambique in the implementation of a fertilizer/seed voucher program pilot initially targeted 25,000 maize and rice farmers, and the program is expected to be scaled up.⁴⁵

⁴³ Per discussions with IIAM, the national agricultural research agency.

⁴⁴ “Mozambique: Memorandum Signed On Fertilizers and Soil Fertility”, www.AfricaFertilizer.org (15/02/11)

⁴⁵ <http://www.ifdc.org/Nations/Mozambique>

A Mozambique input subsidy program could invest in a range of crops, including legumes to promote diversification and income generation. The Mozambican program could also include a focus on post-harvest improvements, including improved drying and storage of grain. At the outset, stronger participation of agro-dealers in the input supply chain should be encouraged in partnership with the AGRA/Standard Bank financing scheme outlined earlier. This program could build on the achievements of IFDC's Mozambique Agro-Dealer Development project, promoting private-sector investment in agro-input technologies and improving farmers' access to these technologies through competitive markets and stronger dealer networks.⁴⁶ Given sufficient research and data, the input subsidy system could also be informed by climate information, especially at the seasonal time scale. Using climate information, and possibly forecasts, in addition to market and soil considerations could help ensure the choice and spatial distribution of inputs is appropriate for expected future conditions.

AGRA and the Earth Institute could support the Mozambican Ministry of Agriculture to design and implement a national input subsidy program that would enhance smallholder productivity and diversification. The program would support partnership with the private sector, especially the seed and fertilizer sub-sectors. This program would also be usefully complemented by improved soil, land, and weather/climate information for agricultural planning and decision-making (see next section and Chapter 3).

3.4 Improved soil and land information for agricultural planning and decision-making

Because knowledge about the condition and trend of Mozambican soils is highly fragmented and dated, there is an urgent need for accurate, up-to-date, and spatially referenced soil information to support agriculture in Mozambique. This coincides with developments in technologies that allow for accurate collection and prediction of soil properties.

The Globally Integrated Africa Soil Information Service (AfSIS)⁴⁷ is a large-scale, research-based project to develop a practical, timely, and cost-effective soil health surveillance service to map soil conditions, set a baseline for monitoring changes, and provide options for improved soil and land management in Africa. It is part of a wider, global effort to digitally map the world's soil resources.

AfSIS is building on recent advances in digital soil mapping, infrared spectroscopy, remote sensing, statistics, and integrated soil fertility management to improve the way that soils are evaluated, mapped, and monitored, while significantly reducing the costs to do so. Innovative soil management methods, such as the combination of inorganic fertilizers with organic inputs that improve crop yields while enhancing the environment, are being tested and documented. The system is also facilitating the identification of areas at risk of soil degradation and corresponding preventive and rehabilitative soil management interventions based on an analysis of what works and what does not.

Dissemination and training is making the project's outcomes accessible to farm communities, public and private extension services, national agricultural research and soil survey organizations, the fertilizer sector, project and local planners, national and regional policymakers, and scientists.

AfSIS is led by CIAT-TSBF⁴⁸ together with the Center for Tropical Agriculture and the Rural Environment (TropAg) and the Center for International Earth Science Information Network (CIESIN) at the Earth

⁴⁶ Ibid.

⁴⁷ For more information on AfSIS, see <http://africasoils.net/>

⁴⁸ **International Center for Tropical Agriculture- Tropical Soil Biology & Fertility Research Area.**

Institute of Columbia University, the World Agroforestry Centre (ICRAF), and ISRIC - World Soil Information. AfSIS has many partners in Kenya, Tanzania, Malawi, Mali, Nigeria, Ethiopia, Ghana, and Mozambique. It also has a number of partners through the Global Soil Consortium in other regions around the world, including government research and academic institutions in East Asia, Europe, the Middle East, North America, Oceania, and South America.

There are currently four sites in Mozambique where survey, sampling, and analysis have been completed in partnership with the Central Soil Laboratory in Maputo. Their locations were randomly located for continental mapping purposes and unfortunately not in agronomically important areas of Mozambique. However, with additional financial support, this work can be extended and intensified in the Beira and Nacala corridors and continue for the whole country. In the process, such a project could build national research and development capacity.

AfSIS could produce a map of soil properties of Mozambique at the scale of 90m, with pixels of 0.8 hectares. This high level of resolution can indicate nutrient response, particularly phosphorus, potassium, sulfur, and zinc, as well as those areas with high probability of dry spells during the rainy season, and crop suitability based on erodibility of soils and other factors.

Based on estimates from existing work in Mozambique and elsewhere in Africa, a digital map of Mozambique with these important functions could be produced within one year for approximately \$1 million. In the process, local capacity can be developed and the applications of the map can be undertaken entirely by national scientific staff at the Ministry of Agriculture.

The AfSIS project would provide valuable information in determining the potential market for different fertilizers in Mozambique and neighboring countries. This in turn would enable a more powerful feasibility assessment of potential investments for national fertilizer production and use. The information collected and shared in the AfSIS project could also be combined with climate information, especially at longer time scales of 30 to 50 years, using the integrated platform to strengthen the knowledgebase for agriculture planning and related infrastructure design (see section 3).

3.5 Agri-business development along the corridors

Recognizing the vast agricultural potential of the Zambezi Valley, the Governments of Mozambique and Norway, along with several private investors and donors, have partnered to promote commercial agriculture along the Beira corridor through the Beira Agricultural Growth Corridor (BAGC) initiative.⁴⁹ The main constraints to commercial agriculture in the region, as discussed above, are inadequate infrastructure (including roads, but also storage and processing facilities), lack of access to long-term financing, under-investments in agricultural research, and limited access to and use of improved inputs and technologies. The BAGC initiative aims to improve coordination of public and private investment along the agricultural value chain, specifically to leverage anchor investments in infrastructure, extend infrastructure to areas of high but untapped agricultural potential, and mobilize financing (including patient capital) for agricultural investment activities.

Early initiatives of the BAGC have also highlighted the challenges of sustaining commercial agriculture, especially out-grower schemes. However, there have been some successes in scaling-up commercial agriculture. Recent private investments in maize processing facilities in Chimoio and Tete by Agriterro

⁴⁹ Information from the Beira Corridor website: <http://beiracorridor.com/>

have created a market for smallholders who are able to generate a surplus. The company provides maize meal to the regional market. With extensive milling and storage facilities, Agriterra is able to purchase from smallholders, with the World Food Program as a significant buyer of the maize meal.

USAID is also supporting market-oriented agriculture aimed at reaching regional and international markets.⁵⁰ Through a value-chain approach, USAID is building linkages and business partnerships between large US investors, other corporate investors, and local producers. Both staple foods and export crops are covered by program interventions that include: (1) development of infrastructure, (2) modern production, processing, and marketing, (3) partnerships with international research centers, (4) market intelligence, and (5) finance for farmers associations. The EMPRENDA Alliance brings together several US organizations, supported by USAID, that promote and catalyze agribusiness development, including ACDI-VOCA,⁵¹ CLUSA⁵², and TechnoServe. EMPRENDA operates in both the Beira and Nacala corridors.

The early successes and also limitations of the BAGC and EMPRENDA initiatives underline the need to coordinate support for access to markets, finance, research, inputs, and technology. Moreover, greater attention could be paid to how such programs can be sustained and expanded.

A specific high-priority initiative that could be undertaken immediately to support and scale up diversification along the Beira and Nacala corridors would be to establish a Zambezi Valley Agribusiness Alliance of Extractive, Agriculture, and Food Industries with the explicit objective of supporting the commercialization of smallholder agriculture in the Zambezi valley. There is an immediate opportunity to link smallholder farmers to markets through *demand-driven* linkages that meet local and regional food requirements. To this end, an alliance could be established that would involve a small number of committed private and public sector partners representing fertilizer, seed, processing, and food retail industries. In the first instance, a core group could include Vale, Mosaic, Agrium, Walmart, AGRA, CGIAR, and Columbia University, among others. The Alliance would aim to reinforce and augment the work of CEPAGRI and other groupings involved with the Beira and Nacala corridors. The distinguishing characteristic of the Alliance would be a sharp focus on smallholder agriculture and commitment to complementary social and infrastructure investments that are discussed in Section 4 of this chapter.

4. Integrating agricultural investments with other sectors to reduce rural poverty

Reducing rural poverty in the rural Zambezi Valley and achieving the Millennium Development Goals (MDGs) requires an integrated multi-sector approach.⁵³ As outlined at the beginning of this chapter, rural communities are challenged with food insecurity, poor access to basic health and education services, inadequate access to clean drinking water and sanitation, limited electricity and telecommunications connectivity, poor transport access to markets, little or no access to affordable credit, and a lack of business enterprise opportunities. The Millennium Villages Project (MVP), described below, has demonstrated, over the past 5 years, the impact and cost-effectiveness of multi-sector area development approach in a diversity of socio-economic and agro-ecological settings. The

⁵⁰ Information from the USAID Mozambique website (several documents): http://www.usaid.gov/mz/rural_income.htm

⁵¹ Agricultural Cooperative Development International and Volunteers in Overseas Cooperative Assistance.

⁵² Cooperative League of the USA.

⁵³ Integrated rural development is one core component of an overall economic development strategy. The other core components include progress in urban areas, in the rollout of national-scale infrastructure (highways, ports, rail, power), and in the voluntary reduction of fertility rates to slow runaway population growth.

design and implementation of integrated rural development projects (IRDPs) at strategic locations within the Nacala and Beira corridors could build on the lessons of the MVP, including successful implementation in Malawi and initial progress in Mozambique (5 locations).

4.1 Integrated approaches to rural development: Millennium Villages⁵⁴

Rural development requires community-based investments that empower local leadership in priority sectors including agriculture, health, education, water, transport infrastructure, energy services, business development, and the environment. It also requires effective community-level institutions that are capable of implementing and sustaining these investments.

The Millennium Villages Project (MVP) is a partnership initiative designed to identify and scale-up solutions to the challenge of integrated rural development (IRD). The Project is divided into two five-year phases, the first of which began in 2006, following initial pilots in Kenya and Ethiopia.⁵⁵ The MVP is working with approximately half a million people living in communities across 14 sites (or “clusters”) in ten countries,⁵⁶ with catchment areas reaching up to 70,000 people per site.

The MVP highlights the value and feasibility of integrated community-based investments, rather than the one-by-one investment strategies too often deployed in rural areas. Because of budgetary limitations, governments, donors, and NGOs too often search for a single “highest-impact” or magic-bullet initiative that will be most “cost effective”: girls’ education, safe water and sanitation, HIV/AIDS control, livestock support, and so forth. One, or maybe two, of these are commonly deployed in a village without the benefit of a more holistic strategy. The result, all too often, is the lack of sustainability of the individual investment, and the lack of an overall breakthrough out of extreme poverty. Such one- or two-dimensional strategies fail to reach threshold levels of community capital investment needed to break the poverty trap.

There are two reasons for an integrated investment strategy. First, for multiple objectives (health, nutrition, poverty, disease control, safe water, etc.) we need multiple tools (such as community-based clinics, diversified local food production, commercial farming, malaria control, piped water, etc.). Second, these multiple tools are synergistic. While each is of merit in supporting a main target, each also contributes to progress on several or all of the goals. Access to safe drinking water, for example, supports health and educational outcomes. Moreover, after decades in which many analysts declared integrated rural development to be unmanageable (and perhaps unnecessary), the MVP and other projects are showing how IRD can indeed be accomplished using the stronger technologies, policies, information systems, macroeconomic environments, and institutional capacities now available, compared with the much weaker tools and context 30 years ago, when the last wave of integrated rural development was pursued.

⁵⁴ Adapted from “Harvests of Development in Rural Africa: The Millennium Villages after Three Years” The Earth Institute at Columbia University, Millennium Promise, and UNDP (2010):

http://www.millenniumpromise.org/pdf/MVP_Midterm_Report.pdf

⁵⁵ The very first Millennium Village was initiated as a pilot in Sauri, Kenya in late 2004, with main interventions beginning in 2005. The second village in Koraro, Ethiopia was launched in 2005. In mid-2006 these sites were both expanded to full “clusters” of more than 50,000 people, and the project was expanded to include clusters in eight other countries.

⁵⁶ Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal, Tanzania, and Uganda. Other countries (including Mozambique) have joined the project, but these are not yet fully integrated into the management structure of the first ten countries.

The MVP's early results have already helped to highlight, at the national and international policy levels, several of the key—and until recently, neglected—investments needed for successful rural transformation. These include an African Green Revolution for higher agriculture productivity (mainly through improved inputs, diversification, agribusiness development, and agronomic practices); comprehensive malaria control (based on full coverage of all sleeping sites by long-lasting insecticide-treated bednets, improved case management, and deployment of community health workers); the expanded training and deployment of paid community health workers; the expansion of school meal programs using locally produced foods; and the creation of effective community-based institutions, such as a local MDG implementation team.

Initially, total investments were estimated to cost \$110 per villager per year, plus another \$10 per villager per year for establishing, training, and paying local staff to lead the village-based systems. This costing was based on the MDG needs-assessment work of the UN Millennium Project and addressed core activities for agriculture, education, health, infrastructure, environment, and gender equality. Thus, the total cost per village was budgeted at \$120 per person per year. Half of that is mobilized directly through the MV initiative, and the other half is to be mobilized through partners, including the community itself (\$10), the national government (\$30), and NGO partners (\$20).

The MVP aims to spur broad scaling-up of integrated rural investments for MDGs. This scale-up is only possible with increased public and private investment. The MVP is successful because: (1) it demonstrates the feasibility of integrated investments to achieve the MDGs in impoverished rural Africa; (2) it helps to create new models for community-based delivery, monitoring, and measurement; (3) it plays a constructive role in helping the global aid commitments come to pass by making the MVP lessons widely known within Africa and internationally; and (4) it helps to encourage increased global public financial flows towards more practical and effective development investments. The MVs emphasize practical mechanisms to foster: (1) local leadership and community participation; (2) long-term institution building, including professional community-based management and staff; and (3) global multi-sector partnerships directly with the villages.

4.2 Design and implementation of IRDPs in Mozambique

The Government of Mozambique, the Earth Institute, Africare,⁵⁷ Vale, and select other public and private organizations could partner to establish a network of IRDPs in the provinces of Tete, Niassa, Nampula, Zambezia, Sofala, Manica, and Gaza. Each province would include 1-3 clusters of villages representing important socio-economic and agro-ecological zones.

For example, in Tete, where the large rural population remains impoverished, education levels are low, levels of HIV/AIDS and malaria are high, and a small proportion of the population is benefiting from the energy and mining boom, it is proposed that village clusters would be strategically located in three zones (see Map 1, above):

- Zone R6 Semi-arid (500-800 mm rainfall): low altitude zone (<200 m) with sorghum and millet the dominant crops; livestock rearing, especially cattle, is important.
- Zone R7 Medium altitude (200-1,000 m) with higher rainfall than R6 allowing for maize production; sorghum, cassava, groundnuts and cowpeas also grown in this zone.

⁵⁷ Africare's President, Dr. Darius Mans, and the Earth Institute's Director, Dr. Jeffrey Sachs, traveled to Mozambique January 8-15, 2011, to discuss a possible partnership to support the Mozambican Government's efforts to assist communities along the Nacala transportation corridor in the northern part of the country. During their trip, Mans and Sachs met with key government officials and other important stakeholders. <http://africare.org/news/news2010/Mans-Mozambique.php>

- Zone R10 high altitude (>1,000 m) with rainfall > 1,200 mm; maize, beans, and potatoes are common.

In each of these zones, poverty and food insecurity are widespread. Yet, the knowledge to improve productivity and the broader market demand presents important opportunities for both public and private investment. Quick wins are likely through improvement in soil fertility and the use of higher-yielding varieties of food crops, especially in zones R7 and R10. This will open the possibilities for surpluses that could be marketed within Tete Province and even exported to Zimbabwe and Zambia. Progress in Zone R6 will prove more challenging. However, the growing demand for beef may provide opportunities for investing in more efficient systems of husbandry, slaughtering, processing, and marketing.

Existing Millennium Villages in Nampula and Gaza Provinces would be included in the network. Each cluster would comprise a minimum of 10,000 persons. The design of the IRDPs—priority interventions and implementation modalities—will be informed by a study of existing Millennium Villages and other rural development projects during June-August 2011, conducted by the Ministry of Science and Technology and the Earth Institute at Columbia University. Subject to available funds, implementation should begin in at least two provinces by 2012, coinciding with the rainy season in this region.

4.3 Support for a national IRDP policy support secretariat in Mozambique

Experience from the MVP in several countries highlighted the need to better inform national policy makers and development partners. Too often the policy lessons and impact of the MVP were not known beyond those directly participating in the project. The creation of a Government-led national IRDP Secretariat would directly address this challenge by providing the following critical functions:

- Facilitate inter-institutional support (government agencies, universities, development partners, private sector, NGOs, etc) for implementation of the IRDPs
- Raise awareness within government, the development partners, and the general public about the IRDPs, including the organization of site visits and national and regional workshops
- Synthesize IRDP experience to inform national policy
- Coordinate monitoring and evaluation and impact assessment
- Coordinate and implement training of IRDP staff
- Mobilize funds for expansion to new locations and for scaling up

5. Partnerships with universities to develop capacity in sustainable development practice

A widely expressed concern in Mozambique is inadequate national capacity to plan and implement sustainable development programs, particularly where these require coordinated and integrated multi-sectoral approaches. Universities are an underutilized resource for sustainable development in Mozambique, as in several other countries in sub-Saharan Africa. Many faculty members have excellent academic training and high commitment, but do not have the resources to undertake new field-oriented coursework that would support a new generation of development practitioners. With adequate support, select universities in Mozambique (e.g., Universidade Eduardo Mondlane and Universidade Lurio) could develop and implement new undergraduate and master's level programs in sustainable development practice. An important part of this initiative would be extended internships of students to be located in IRDPs, including existing Millennium Villages in Mozambique and

neighboring countries. The Global Master's in Development Practice Programs Network⁵⁸ provides a suitable platform for mobilizing support.

⁵⁸ For details on the function of the Network and links to member institutions, see <http://mdp.ei.columbia.edu/>

6. Conclusion and summary of recommendations

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Unlocking the agriculture potential in the Beira and Nacala corridors	<p>Expanding rural roads network by prioritizing the most fertile regions, such as the highly untapped productive areas of Tete province where demand for food commodities is increasing rapidly</p> <p>Strengthening and scaling up rural finance institutions and initiatives, such as GAPI and the AGRA-MCA fund, drawing on successful recent financial leveraging experience from Nigeria and other countries, and possibly bundling with risk transfer instruments including index-based weather insurance</p> <p>Establishing the Zambezi Valley Agriculture Development Center (1) for smallholder-focused adaptive research (including climate risk management), seed multiplication, extension, and training throughout the region, 2) to be located in Tete and operate in a decentralized agro-ecosystem-based manner through existing government facilities)</p> <p>Adopting a voucher-based input subsidy program (1) focused on both productivity improvement and post-harvest improvement, 2) with strong participation of agro-dealers, 3) drawing on experience of the region</p> <p>Assembling up-to-date, spatially referenced soil and climate information to support agriculture in the most agronomically suited regions of Beira and Nacala corridors by extending the work of AfsIS and linking with weather/climate monitoring efforts over a longer time scale</p> <p>Establishing the Agro-Business Alliance of Extractive, Agriculture, and Food Industries with the objective of supporting the commercialization of smallholder agriculture in the Zambezi Valley</p>	<p>Min. of Public Works and Housing, Min. of Agriculture, MPD, MICOA</p> <p>Local Governors, National Road Authority (ANE) , ,</p>	<p>Central Soil Laboratory in Maputo, Extractives, Mosaic, Agrium, Walmart, AGRA, CGIAR</p> <p>National Institute of Meteorology (INAM)</p>	<p>WB, AfDB, MCC/MCA, USAID, Embrapa, AGRA, CGIAR, BAGIC, CEPAGRI, GAPI, IFDC, AfsIS, CIESIN, ICRAF, CIAT-TSBF, ISRIC, ILO, IRI, WMO, Columbia University</p>
Integrated Rural Development (IRDP) in the Beira and Nacala corridors	<p>Designing and implementing a network of IRDPs in the provinces of Tete, Niassa, Nampula, Zambezia, Sofala, Manica and Gaza provinces, to be informed by a study of existing MV and other rural development projects during June-August 2011, conducted by the MST and the Earth Institute at Columbia University.</p> <p>Establishing a National IRDP Policy Support Secretariat to facilitate inter-agency coordination, synthesize IRDP experience to inform national policy, and coordinate capacity building, monitoring and evaluation and resource mobilization for program expansion</p> <p>Supporting selected universities in Mozambique to develop and implement new undergraduate and master's level programs in sustainable development practice</p>	<p>Min. of Agriculture, Min. of Science and Technology (MST), MPD, Min. of Health, Min. of Education, Min of Labor, Min. of Public Works and Housing, Min. of Energy</p>	<p>MST's network of MV, Eduardo Mondlane University Lurio, Africare</p>	<p>Earth Institute/ Columbia University, UNDP, USAID</p>

Chapter Two: Leveraging the Mining Investments for Sustainable Development

Introduction

This chapter discusses the potential for leveraging extractive industry investments in the Zambezi Valley for regional economic development and diversification. Exploitation of Mozambique's rich and diverse resource base, driven by strong global resources demand, can provide a unique opportunity to go beyond supplying raw materials to the world economy and create opportunities for resource-based development in Mozambique and the surrounding region. This opportunity will be realized if the natural resource sector is used as an anchor to establish the requisite economic infrastructure across the country and the region, creating the crucial resource sector linkages into the local and regional economies and embarking on an inclusive growth path. This "deepening" of the resource sector through upstream (resource supply/inputs sector), downstream (resource processing and beneficiation), and side-stream (human resource and infrastructure development)⁵⁹ linkages could form core industrialization dynamic for Mozambique and neighboring economies such as Malawi and Zambia. Over time, this deepening will diversify the economy: the increasing human resource development and skills formation will be conducive to a shift from a resource-dependent economy into resource-independent economic activities. The transformative impact of the natural resource sector on the development of the Zambezi Valley will be maximized if public and private partners pool their resources around concrete strategies and action items to leverage the major investments in the region.

This chapter casts a light on those strategies and action items, leveraging the synergies with extractive industries; to that extent, it supports the implementation of the Spatial Development Initiative (described below).

Leveraging the natural resource sector with the Spatial Development Initiative (SDI)

Natural resource concessionaires have traditionally adopted an enclave approach to infrastructure development, providing their own power and transportation services to ensure that the basic infrastructure needed for their operations are reliably available. This means that large investments in physical infrastructure (mainly power generation, rail, and ports) are often uncoordinated with national infrastructure development plans, missing the opportunity to take advantage of potential synergies and scale economies. Indeed, it remains the case that there is rarely, if ever, coordinated dialogue (among private investors, government, development partners, civil society, and other stakeholders) about how to maximize the synergies between the private sectors' infrastructure and human capital needs and plans and those of the country. **If companies and governments consider the potential public use or expansion of the private sector's planned investments at the design phase, and how the infrastructure can be expanded or built to meet local, national, and regional needs over time, then "the incremental capital cost could be minimal."**⁶⁰

In part as a response to counter the enclave model, South Africa's Spatial Development Initiative (SDI), subsequently supported by NEPAD,⁶¹ initiated the "spatial development program," where spatial

⁵⁹ Jourdan Paul, *The Utilization of Mineral Wealth for Development Purposes in South Africa*, October 2010

⁶⁰ McPhail in Richards, J.P. ed., *Mining, Society and a Sustainable World* (Springer, 2009)

⁶¹ New Partnership for Africa's Development (NEPAD)

development corridors are anchored around natural resource projects, and in particular, minerals characterized by high rent. The reason is that these high-rent minerals generate cash flows and cargo volumes large enough to finance the backbone infrastructure needed to create a development corridor involving lower rent activities with high development impact, such as agriculture. The SDI strategy is to coordinate the infrastructure development along these corridors (in power, roads, rail, ports, energy, and information and communication technology); to spread the reach of the corridor through supplemental “feeder” infrastructure (a process called “densification”) and by identifying upstream and downstream linkage opportunities with local small- and medium-sized enterprises (SMEs) (a process called “deepening”).

The SDI unit of Mozambique’s Ministry of Transportation and Communication (MTC) is responsible for implementing the development corridor concept in Mozambique. In 2010, the WB launched a Spatial Development Planning Technical Assistance Project in Mozambique “to improve national social and economic development planning through the introduction, institutionalization, and mainstreaming of multi-sectoral spatial development planning methodologies and practice.”⁶² The MTC accordingly established the Coordination Commission for Studies and Projects (COCEP), an inter-ministerial commission to coordinate with the WB Spatial Development project.

COCEP should coordinate all public and private investments along these corridors to ensure alignment between public investment priorities and private-sector plans, to increase the opportunities for limited resources (both fiscal and infrastructure) to be used effectively and to take advantage of cross-border synergies. Moreover, **this coordinated approach can be incorporated into future agreements with new private-sector investors and other development partners in the region, further maximizing the use of public, private, and donor resources.** The World Bank technical assistance project recognizes that “the need to step-up poverty reduction efforts in developing countries requires that the public and private sectors improve the design and coordination of their planning and investment work to maximize the economic and social benefits/outcomes of all investment programs and projects that are undertaken.”⁶³ This is discussed in more depth below.

Coordination is also needed at the level of all the relevant stakeholders (government, private sector, donors, regional banks) to successfully implement the SDI. The first integrated corridor in Mozambique, the Maputo Development Corridor, benefited from the large Mozal and Sasol investments; however, the full extent of the anticipated benefits, which relied in part on densification and deepening, have remained limited, particularly on the Mozambican side. Various line ministries and agencies need to play a constructive role at the national and regional level to streamline planning efforts and to implement the needed public investments required to ensure densification and deepening of the corridor.

Coordination along the Beira and Nacala corridors is both critical and timely, given the regulatory complexities of both corridors, the strategic importance of the transport routes for both mining and agricultural development, and the urgency of upgrading the infrastructure. DFID is currently in the process of designing a program, in partnership with the MTC and other stakeholders, to support development along these corridors. The emphasis of the program is likely to be on strengthening policy, planning and regulatory capacity; promoting infrastructure development; crowding-in investment along the corridors; and promoting stronger integration with neighboring countries. As the program develops, it could usefully engage a wider range of stakeholders to ensure a coordinated approach to

⁶² Project Appraisal Document, September 7, 2010.

⁶³ Ibid

development. This chapter supports implementation of the SDI along the Beira and Nacala corridors by identifying such opportunities and priorities for multi-stakeholder engagement.

1. Leveraging the natural resource sector for infrastructure development

1.1 The Beira and Nacala corridors: a snapshot of their infrastructure

Beira corridor

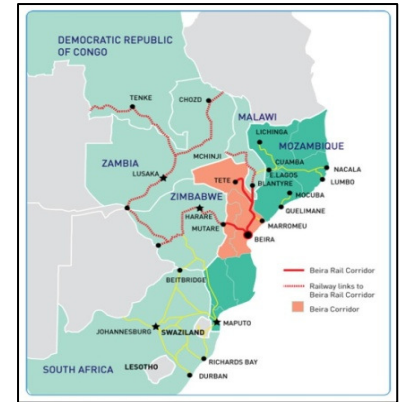
Roads: Long unpaved sections⁶⁴ despite the PRISE⁶⁵ rehabilitation program

The Beira Road Corridor serves: 1) Beira–Mutare–Harare–Chirundu–Lusaka Route, 2) the Beira–Tete–Blantyre Route (the “Tete Route”) and 3) the Beira–Nhamilabue–Nsanje–Blantyre Route (the “Sena Route”).

The Tete and Sena routes suffer bottlenecks since most road traffic to and from Malawi uses these routes. The situation is eased now that Tete’s Zambezi River bridge has been rehabilitated and that another bridge is being built further downstream.

Railways: Two rail lines of unequal quality and activity

1) The 317km Machipanda line linking the Beira Port to the railway network in Zimbabwe at Mutare station; and 2) the 670km Sena line including the link from Beira Port to the Moatize coal mines and the diverging branch from Dona Ana to the Malawi Border. The Sena line (excluding the branch from Dona Ana to Malawi) has been under a rehabilitation plan with support from the World Bank and European Investment Bank for an upgrade up to 6 Mt per annum capacity by the end of 2011 (14% of Rio Tinto/Riversdale and Vale’s joint capacity) and 12 Mt per annum in 2014. The plan is now stalled for termination of the concession agreement. *Concessionaire: The former CCFB concessionaire (joint venture between Companhia de Ferros de Mocambique (CFM) and the Indian RICON) was dismantled in March 2011 and as of this report, the concession arrangement has not been renewed.*



Port: Only small feeder vessels can enter the Port of Beira

Nominal capacity: 5 to 6 Mt per annum; Throughput: traffic of 2.7 Mt per annum and 92,300 containers in 2009.⁶⁶

The Beira port is the hub of the corridor and serves as one of the world’s gateways to Mozambique, Malawi, Zimbabwe, and Zambia. Because of limited channel depth, currently only feeder services mainly from Durban are available at this port without any transshipment. Since May 2009, the Government of Mozambique, the European Investment Bank, and the Dutch and Danish Governments have invested in the development and dredging of the Beira port. Vale and Rio Tinto/Riversdale are rehabilitating the coal terminal (Quay 8)⁶⁷ for US\$34M. *Concessionaire: Cornelder de Moçambique (joint venture between Dutch Cornelder Holding (67%) and CFM (33%)). The concession is for 25 years and started in 1998 and does not include the oil and coal terminals.*⁶⁸

Power: Extensive hydro and thermal potential, yet extremely low access to electricity

The bulk of Mozambique’s generation capacity (the 2075MW Cahora Bassa Hydropower (CBH) station) and the bulk of the thermal and hydropower potential are in Tete province. Despite this potential, most of the households along the Beira corridor do not have access to electricity (access rates are 4.7% of the population in Tete, 10.2% in Sofala, and 6.4% in Manica).⁶⁹ The most significant project to realize this potential is the planned US\$2.5bn Power Transmission System (CESUL).

Nacala corridor

⁶⁴ Some segments of the N6 (during 40km after Dondo in the direction of Zimbabwe) and of the N7 (50km after Moatize up to the frontier)⁶⁴ remain in poor conditions despite their importance for the traffic as well as most feeder roads in Manica and Tete (Source: www.beiracorridor.com)

⁶⁵ PRISE: 5-year master plan for roads, known as the integrated Road Sector Program a donor contributed sector-wide initiative for developing the national road network (See in the partner section).

⁶⁶ <http://ports.co.za/beira.php>

⁶⁷ <http://www.coalservices.com/ICCCDownloads/L%20Hendrikz%20H%20Pinheiro%20J%20Jonker%20ICCCForum%202010.pdf>

⁶⁸ To our knowledge, the oil terminal is owned by CFM and the coal terminal concession arrangement is about to be finalized between CFM and the private investors of the terminal (Vale and Rio Tinto/Riversdale).

⁶⁹ Cuvilas CA, et al. Energy situation in Mozambique: A review. *Renew Sustain Energy Rev* (2010), doi:10.1016/j.rser.2010.02.002

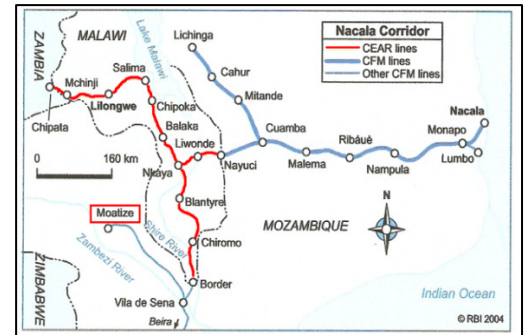
Roads: The trunk route to the port currently serves low traffic volumes

Roads cover over 1,700 km and two one-stop border posts connecting the Nacala port with Malawi and Zambia through **Nacala–Nampula–Cuamba–Mandimba/Chiponde–Mongochi–Liwonde–Dedza–Lilongwe–Mchinji/Chipata–Luangwa–Lusaka**. The route is not currently functional especially because of the poor condition of the Mozambican road sections from Nampula to inland countries. Malawi trunk roads are in much better conditions.⁷⁰ Under the Nacala Road Corridor Project, AfDB and MCC are funding rehabilitation work.

Railways: Low railway operation speed and capacity due to track deterioration

The Nacala Rail Corridor encompasses the Nacala–Nkaya–Chipata and Blantyre–Nkaya lines.

The potential throughput is 1 Mt per annum, but the average throughput is 250,000 tpa, mostly because of the poor condition of the tracks; 70% of the current cargo going through the line belongs to Malawi, and the Malawi government subsidizes passenger rail service thrice weekly in both directions from Blantyre to Nayuchi. Vale, as a majority owner of SCDN (see below) has a plan to invest US\$2bn in upgrading 906 km of the corridor, including construction of a new railway link from Moatize to the border of Malawi, rehabilitation of the railway link in Malawi and the existing railway link from the Malawi border to Nacala. As a result, the expected capacity is 18 Mt per annum, and the work should be completed by 2014/2015 according to Vale's current plans.



Port: The traffic at the port is expected to increase rapidly beyond its current capacity

The Nacala port is a natural deep-water port with a depth of 15 meters, not necessitating regular dredging, and with potential handling capacity beyond the expected future coal exports of 48 Mt per annum by 2017.⁷¹ The port is currently used mostly for international trade to and from Mozambique with a relatively low volume of transit cargo (950,000 tpa) due to the undeveloped road corridor and inefficient railway.⁷² The Government of Japan has funded a feasibility study for the rehabilitation of the Port and its integration with the Nacala railway (feasibility study and funding).

Rail and ports concessionaire: In September 2010, Vale became the majority shareholder (51%) of the private investors' share of the Sociedad de Desenvolvimento de Corridor de Norte (SDCN), the consortium holding 51% of the Mozambican Nacala port and railway concessionaire (Corredor de Desenvolvimento do Norte (CDN)), and the Malawian railway concessionaire (Central East African Railways (CEAR)).⁷³ With CFM, holding 49% of CDN, SCDN has the seamless concession for both the Nacala port and Nacala railways up to the Zambian border.

Power: Aging transmission line and very low access to electricity along the corridor

Urban areas are connected to Mozambique's national grid via aging 220 kV and 110 kV lines that are connected to CBH located in Tete province. In Malawi, run-of-river hydropower projects on the Shire River generate 98.5% of the electricity utilized in the entire country and are highly vulnerable to climate change. Only 4.9% of the population in Niassa, 7.2% in Nampula, and 6.0% in Malawi are connected. The most critical project affecting energy supply in the region is the proposed Malawi-Mozambique Interconnector project.

⁷⁰ 45% of the road network, as opposed to 18.5% for Mozambique (AICD Country Report)

⁷¹ www.portodenacala.co.mz/eng/index.php.

⁷² It takes about 25 days on average from the arrival at the port to arrival in Malawi, due to the inefficiency of transshipment from sea transport to railway.

⁷³ CDN has been the 15-year concessionaire since 2005, and CEAR has been the 25-year concessionaire since 1999.

Internet and telecommunications spotty along both corridors:

Since the liberalization of the ICT sector, three companies are now operating in Mozambique. Mobile services have far outgrown the fixed-line network, reaching more than 6 million subscribers in 2009,⁷⁴ up from 12,000 in 1999. The global system for mobile communications (GSM) voice signal covers most of the stretch from Nampula to Nacala on the Nacala corridor and the main cities on the main roads of the Beira corridor. In Malawi, the private sector has single-handedly brought GSM to the entire nation, without any subsidy.⁷⁵ GSM geographically covers 93% of the Malawian population (versus 55% in Mozambique)—one of the highest on the continent. However, only 5%⁷⁶ (versus 26% in Mozambique) of the country subscribes to mobile services, which are still considered unaffordable in Malawi. As opposed to Mozambique, Malawi is not connected to submarine cables. Prices for Internet and international calls could drop significantly if Malawi could extend the fiber-optic cables from Malawi to the coast along the Nacala corridor. This connection would also help Mozambique, since the only links to the 1280 gigabits Seacom and 4720 gigabits Eassy cables are in Maputo.⁷⁷

The Internet user rate is very low (0.15% for Malawi and 0.9% for Mozambique), and the international Internet bandwidth is very slow (0.19 Mbp/capita as opposed to 5.8 Mbp/capital in other low income countries).⁷⁸ Service quality for telecoms and Internet is overall weak in Mozambique outside Maputo.

⁷⁴ <http://www.audiencescapes.org/country-profiles/mozambique-who-and-what-mobile-phone-market-mozambique-mcel-vodacom-SMS-tariff-profile>

⁷⁵ About one third of the average across other low-income countries in Africa (Malawi country report, AICD, World Bank)

⁷⁶ Malawi country report, AICD, World Bank

⁷⁷ <http://manypossibilities.net/african-undersea-cables/>

⁷⁸ International Telecommunications Union, African Telecommunication Indicators, 2007

1.2 Long-term planning of the corridor and coordination of players

COCEP should play a coordinating role among the various stakeholders to realize the development potential along both the Beira and Nacala corridors. The cornerstone of such coordination should be a **detailed, aspirational, ambitious, long-term infrastructure map for transportation, energy and information and communication technology (ICT), coordinating and guiding public and private infrastructure investments.**

In order to be a meaningful tool for long-term infrastructure development along the corridors, the map should be an *aspirational* 10-year plan, indicating all of the infrastructure necessary for national development by 2020 (including power, roads, rail, energy, ports, fiber-optic cables, and mobile telephone networks). **This map would indicate how the various infrastructure networks (transport, ICT, energy), overseen by different ministries, interact to promote corridor development.** To that extent, this map should be a common undertaking of the MTC, the Ministry of Public Works (responsible for road development) and the Ministry of Energy, under the supervision of COCEP.

A clear understanding of the spatial distribution of current and potential economic activity⁷⁹ as well as of the geographic and demographic features along the corridor can strategically inform infrastructure priorities and guide the three ministries in their discussion with donors, regional banks, and the private sector. Such an exercise will rely on digital mapping and Geographical Information System (GIS) and could usefully draw on the experiences of other countries using these tools, such as Nigeria, Kenya, and Ethiopia.⁸⁰ The Global Spatial Data Infrastructure Association (GSDI),⁸¹ which supports best practice and methodology sharing among its members, could support this undertaking.

This policy instrument would help identify the **potential for shared infrastructure platforms** between natural resource concessionaires and other users; identifying shared infrastructure platforms can promote economies of scale, potentially reduce environmental disruption,⁸² and create the basis for engaging other partners, designing cost-sharing arrangements or informing policy. A 10-year ambitious plan might lead to the constitution of a special fund to facilitate more investment in rail, roads, ports, and other critical infrastructure to support the workforce and jobs in regional and mining communities, and along transport corridors.

The map would also help **anticipate the demand for various forms of infrastructure** along the corridors, by assessing the potential economic activity and its related potential infrastructure demands. Anticipating necessary infrastructure upgrades before reaching capacity gridlocks⁸³ can help to ensure that capacity constraints do not block potential growth. For instance, eight coal mines are expected to

⁷⁹ Carruthers, Robin, Ranga Rajan Krishnamani, and Siobhan Murray, "Improving Connectivity: Investing in Transport Infrastructure in Sub-Saharan Africa", AICD Background Paper 7, Africa Region, World Bank.

⁸⁰ The Nigeria Government uses GIS to map Lagos and anticipate future infrastructure needs; the Second General Congress of the Geographic Information Society of Ethiopia (GISSE) was held on 22 March 2011 in Addis Ababa, attracting 300 policymakers, geoscientists, educators, researchers and various experts in GIS; and the University of Helsinki has opened a research station in the Taita Taveta county of Kenya and established an agreement of collaboration with the University of Nairobi to use geographic information systems for mapping, modeling, analyzing the landscape changes. GSDI Africa Newsletter, April 2011.

⁸¹ The purpose of the GSDI organization is to promote international cooperation and collaboration in support of local, national, and international spatial data infrastructure developments that will allow nations to better address social, economic, and environmental issues of pressing importance. www.gsdi.org

⁸² Compared to developing two parallel systems.

⁸³ www.eu-africa-infrastructure-tf.net/attachments/library/aicd-background-paper-8-ports-sect-summary-en.pdf

be operating by 2016 with a total output of 48 Mt per annum by 2017⁸⁴ and 100 Mt per annum by 2025.⁸⁵ But coal production is conditioned by coal export capacity, which means that adequate transportation solutions need to be devised to realize the forecast production. At present, the capacity envisioned for the Sena line and Nacala line is insufficient to meet these levels of production. The proposed solutions of barging the Zambezi River or using a slurry pipeline have been approached cautiously, given their environmental risks. A new high-capacity dedicated coal line from Moatize to a new port at Savane is also in discussion but is not planned as a shared platform for the rest of the economy. Given the timeline for scaled-up production of the coal mines, evaluating the transportation options, including both their risks and potential spill-over benefits for the rest of the economy, is a priority. The Resource-Based Development Advisory Group, discussed in the conclusion of the report, could usefully help in this undertaking.

Finally, the map would help identify the projects that, although critical for the development, are **stalled or neglected** for various reasons, including disagreements between stakeholders or lack of financing.

The map should be accompanied by a **comprehensive database** of public, donor-funded, bank-funded, and privately-funded infrastructure development plans, including details of:

- terms for third-party access for railways and terminals
- multi-modal capacity and reliability for terminals and ports (transport cost, transport time, reduction of risks)
- costed plans for the operations and maintenance of each project
- project timelines (including delays), and
- general transport sector statistics, backed by regular data surveys, conducted by the MTC and the Ministry of Planning and Development (MPD).

In the medium to long term, strategic planning for the corridors would improve efficiency and reliability of exports and imports on rail transport to the ports of Nacala and Beira, increase access of rural communities to major trading centers and national transport networks, and unlock basic constraints to development including rural electrification, telecommunication access, and feeder roads (as discussed in Chapter 1). **In turn, these fundamental improvements should be supported by further investments in other supporting infrastructure for agriculture and industries whose potential will be unlocked by efficient infrastructure networks.**

However, in the short term, to enable this strategic planning, **clarification and adjustments to the regulatory framework of the Beira and Nacala rail corridors are much needed and demanded by all of the stakeholders with an interest in those corridors. This framework should reestablish trust among the actors and enable progress on stalled, delayed, or uncertain infrastructure projects along the corridors.**

The following sections elaborate on important aspects of the regulatory framework that would underpin strategic planning and project development along the corridors.

⁸⁴ MIREM Forecast- Source: *Mining Journal*, 29 Oct 2010

⁸⁵ Mozambican Association for Mineral Coal Development Forecast;
<http://www.railwaysafrica.com/blog/2010/11/mozambique-coal-plan-needed>

1.3 Beira corridor/Sena line: a new concessional arrangement and an opportunity for development

1.3.1 The Sena line completion is stalled

Along the Beira corridor, the Sena railway stopped operating for more than 20 years during the civil war, but the line regained attention with the mining potential arising in Tete and the project to connect the Beira port to southern Malawi. In 2002, CCFB, a joint venture between state-owned Companhia de Ferros de Mocambique (CFM) and RICON, an Indian consortium (49%/51%), was awarded the 25-year concession of the Beira corridor railways (both the Sena line and the Beira-Zimbabwe line). In that capacity, the concessionaire planned to rehabilitate and reconstruct the 575km Sena line, linking Beira port to the Moatize coalfields, with financial support from the World Bank and European Investment Bank. The Sena railway was scheduled to reopen in October 2010, after completion of the rail track adjustment to realign the tracks.⁸⁶ The objective was to rehabilitate the line for US\$260M⁸⁷ to an initial handling capacity of 6 Mt per annum⁸⁸ that Vale and Rio Tinto/Riversdale would share in 2011 when they would each begin production. Thereafter, CCFB would ramp up this capacity to 12Mt per annum by 2014.⁸⁹

After multiple delays in construction attributed to the lack of investment by the Indian consortium, the concession agreement was cancelled in March 2011. Pressured by the production timeline of the mining companies in Moatize (Vale and Rio Tinto/ Riversdale), MTC and CFM are looking for a new concessional arrangement for the Beira corridor. The first trainloads of coal exports from Moatize are expected to travel down the Sena line to Beira in September 2011. If operational, the Sena line will be the only non-road transport solution to accommodate the 2011 Moatize production as well as the next 3 years' production.⁹⁰

The success of this new concession agreement is fundamental to unlock the mineral potential of Tete, to reinstate trust between the Government and private investors, and to prove the political will to lift the major infrastructure roadblocks. In fact, in the Moatize mining framework agreement with Vale, the Government of Mozambique committed to use its best efforts to authorize the granting of and entering into of all agreements and concessions, in connection with any required project-related infrastructure for the mine project. Failure of the Government to fulfil its obligations in this respect is cause for termination and compensation of all costs incurred by Vale, including the bid payment.⁹¹

The need for reassigning the concessional agreement on the Beira corridor presents the opportunity to establish a sound regulatory framework that avoids the pitfalls of the old enclave model of exclusive access railways and therefore enables the contribution of the corridors to the development of the country. This is discussed in the following section.

⁸⁶ Railroad Development Corporation: <http://www.rrdc.com/>

⁸⁷ http://portal.eiu.com.libproxy-wb.imf.org/report_dl.asp?issue_id=103114595&mode=pdf

⁸⁸ 6Mtpa represents 14% of coal production at full capacity of Vale and Rio Tinto/Riversdale together. The scope of the Sena line refurbishment plan was designed before the actual potential of Moatize coalfields was fully assessed.

⁸⁹ www.railwaysafrica.com/blog/2011/02/sena-line-further-upgrade

⁹⁰ A Nacala line capable of hauling 18 Mtpa of coal will take 3-4 more years to become operational according to Vale's plans (Environmental Impact Assessment Presentation).

⁹¹ Isabel Marques de Sa, N. P. (2006). "Strike while the coal is hot!" – a Public Private Partnership approach to the development of the Moatize Coal Deposit. International Finance Corporation REVIEW 2005/2006. Euromoney Yearbooks

1.3.2 Rail concessions and the risk of exclusive access

Rail concessions in Mozambique, as throughout southern Africa,⁹² have been vertically integrated: they include both the infrastructure and the operations, and they include commitments for investment in upgrading, operations and maintenance to be financed by the concessionaire, even though the government remains the owner of the tracks. Importantly, rail concessions exhibit natural monopoly features: the production technology involves high fixed costs, which are usually sunk, and there are relatively low operating costs, as a result of which long-run average total cost and marginal cost decline as output expands.⁹³ In this situation, competition will be wasteful if duplicative facilities are constructed and the lowest possible average cost cannot be achieved. In other words, it is most efficient for one firm to supply all of the market's demand.⁹⁴ Under such circumstances, however, a policy of awarding a monopoly concession in order to minimize costs may result in exclusive access or monopoly pricing for railway access, especially if the concession is awarded to a mining company.

Mines use rail and ports as part of an integrated mine-rail-port production system in which reliability and flexibility are essential; third-party access to the rail line is seen by mining companies as presenting a risk of interference with the performance of the logistic chain of the mine⁹⁵ and is therefore generally avoided by mining companies. This has been recently recognized by the Chairman of CFM in an interview given to the independent daily, *O Pais*, about a new concessional arrangement. The Chairman "ruled out leasing the line to any of the companies mining coal in the Moatize basin, on the grounds that this might lead to a conflict of interests between the company given the lease and the other mining companies."⁹⁶

1.3.3 A new concessional model: multi-user and promoting open access

A possible solution, already discussed by the Mozambican Association for Mineral Coal Development (AMDCM)⁹⁷ and the MTC, could be to establish a concession where the ownership of the line and the allocation of the responsibility for capital expenditure are granted to coal companies according to their tonnage allocation (See Figure 2). Under that model, also valid for a port concession, each coal company funds a capacity slot on the line according to two criteria: (1) its anticipated production and (2) an additional margin decided by the regulatory power to be allocated to other bulk users who cannot afford the weighty investments in the railway infrastructure, such as the agriculture and forestry sectors. The state-owned company, CFM, would hold a share⁹⁸ in the multi-user model to ensure that open access to the line for other bulk users is enforced. CFM and companies would need to devise a solution as to who would provide the engines, rolling stock and crews for the low-rent, non-coal traffic (agriculture and forestry). One option would be for the multi-user concession to contract a conventional railroad operator for this purpose.

⁹² www.northsouthcorridor.org/media/090330_full_final_report_-_formatted_2_english.pdf

⁹³ Higher costs will result if more than one producer supplies the market, as each producer will have to spread its fixed costs over smaller output volumes.

⁹⁴ <http://www.austlii.edu.au/au/cases/cth/ACompT/2010/2.html>

⁹⁵ As seen recently in the case of Fortescue vs Rio Tinto and BHP in the Pilbara Basin, Australia:

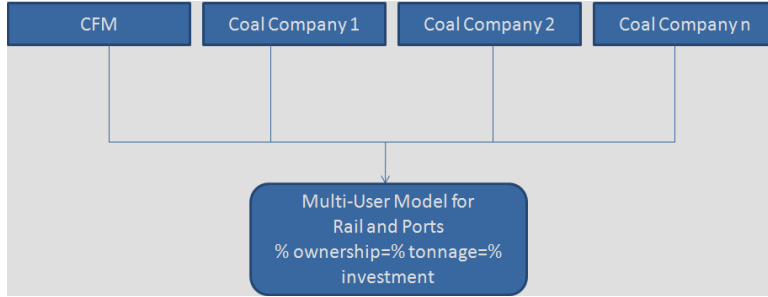
<http://www.railwaygazette.com/news/single-view/view/fortescue-opens-the-worlds-heaviest-haul-railway.html>.

⁹⁶ <http://newsmoz.blogspot.com/2011/02/sena-line-not-single-kilometre-in-good.html>

⁹⁷ The AMDCM is the coal mining company association in Mozambique.

⁹⁸ Per interview, this share could be about 30-35%, and as an owner, CFM would be paid user charges by the other shareholder companies; these charges would be set at a level low enough to account for their capital investments in the line.

Figure 2. Multi-User Model for Rail and Ports



This open access is of critical importance to guarantee that this corridor is also a catalyst for economic diversification along the corridor. In addition to coal cargo, general bulk cargo should be carried on the line without presenting a risk to the logistic chain of the mining companies. The case of state-owned Transnet Freight Rail in South Africa, , operating under a common carrier regime, reveals that hosting general cargo on a heavy haul coal line is possible and economically rational, and the Richard Bay Terminal, where the rail terminates, is an example of a successful multi-shareholder ownership model (see box).

Transnet Freight Rail: a common carrier regime,⁹⁹ and Richard Bay Coal Terminal: a multi-user ownership model

Transnet Freight Rail's core business lies in freight logistics solutions designed for industries such as mining and heavy and light manufacturing. On the Mpumalanga to Richards Bay line, minerals, grain, and fuel are transported. Starting at Mpumalanga's 44 coal-rich mines, the 580km double rail line descends from the Highveld through rural KwaZulu-Natal and terminates at Richards Bay Coal Terminal.¹⁰⁰ The private terminal is owned by Anglo Coal, Xstrata Coal, Eyesizwe, Ingwe, Kangra Coal, Sasol, and Total Coal South Africa, and is about to be expanded into the largest single coal export terminal in the world.¹⁰¹

This multi-user model for the management of the concession relies on extraordinary coordination of all the stakeholders of the line, especially when the railways approach capacity.

Coordination costs when the railways approach capacity

The example of the British rail provider, Railtrack, suggests that problems of coordination increase rapidly as the railways approach capacity and when access users vary in their requirements due to:

- an increased need for maintenance with a consequent risk for disruption of services,
- an urgency to establish incentives for the provider to invest in added capacity,
- difficulty in reaching a consensus about how the scarce remaining capacity should be allocated, or which investments are most needed.¹⁰²

The engineering, technological solutions, and public-private partnership that will be required to operationalize this concessional arrangement would implement a best practice model that too few

⁹⁹ Derailments on the Transnet lines in recent months have raised doubts about the capacity of the line to be optimal as an export coal line, but experts agree that these problems are due to mismanagement and poor anticipation of the operator.

¹⁰⁰ www.railway-technology.com/projects/richardsbay-coaline

¹⁰¹ <http://www.miningweekly.com/article/tender-process-under-way-for-part-in-worlds-largest-coal-terminal-2006-09-15>

¹⁰² Ibid

countries in Africa have applied so far. To ensure its success, this arrangement needs to be accompanied by a revised best practice regulatory framework relying on 5 fundamental principles, laid out below.

1.3.4 A best practice regulatory framework: 5 principles

1) Sufficiently long concession period

Given the substantial investment costs that each concessionaire shareholder will incur, a suitable concession period has been internationally assessed to be typically between 25 and 30 years.¹⁰³ In that context, for instance, if the agreement renewal is not implemented, the current 15-year CDN concession of the Nacala corridor is too short to ensure the amortization of the large necessary investments.

2) Track user charges at non-discriminatory rates

Requiring open access to the line needs to be paired with the stipulation that access “shall be given upon reasonable and commercial terms without any discrimination,” as is the case in Mozambique’s petroleum pipeline regulations.

Regulators typically allow the train operator and rail provider to negotiate the tariffs, with the regulator ready to intervene in the event of an impasse. However, pre-established rules to set up tariffs are a better guarantee that non-discriminatory tariffs will be applied.

International best practice suggests that non-discriminatory tariffs should be a fair return above operating and financial costs¹⁰⁴ and scalable to reflect the likely different levels of traffic brought by multiple users to the line. A fair return on infrastructure starts at 12%, according to the Morgan Stanley Global Infrastructure Index.¹⁰⁵ **Therefore the law or concessional contract would establish that third-party access will be given at “Costs + 12%” for example.** To make economic sense for bulk commodity farmers, this tariff should be below the truck tariff¹⁰⁶ of US 5 cents/ ton-km.

3) Monitoring committee with audit capacity

Ensuring that the tariff applied by the concessionaire is non-discriminatory is critically important. It is a complex task that requires a great deal of information if it is to be done well. The regulated enterprises often have better information concerning their operations than do the regulators, and they may use the control of information strategically to try to influence the regulatory outcome. For this reason, a monitoring committee with audit capacity is needed.

The regulatory authority could usefully appoint a strong consortium of expert economists, geologists, engineers, computer simulation experts, rail modelers, train schedulers, quantity surveyors, metallurgists, bankers and environmental scientists to be in charge of independently auditing the concession’s yearly rate of return on equity and fixed assets, as well as its economic rate of return. **The outcome of this audit would allow post-contract management and, importantly, assessments of what the non-discriminatory tariffs should be for other mines seeking access to the line, as well as for farmers and other users.** This expert consortium could be convened under the auspices of the

¹⁰³<http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTLAWJUSTICE/EXTINFRAANDLAW/0,,contentMDK:21729743~menuPK:5099971~pagePK:4710368~piPK:64860384~theSitePK:4817374,00.html#examples>

¹⁰⁴ For example, as stipulated in Brazil regulations (<http://www.regulationbodyofknowledge.org/documents/215.pdf>)

¹⁰⁵ <http://beta.dcgulf.com/wp-content/uploads/2010/03/Morgan-Stanley-Global-Infrastructure.pdf>

¹⁰⁶ Republic of Malawi Ministry of Transport and Public Infrastructure, Data Analysis on Intermodal Corridors for Malawi, Safage Consultants for the European Union and the World Bank, June 2010

University Eduardo Mundlane, for instance, with the support of the AfDB, and could include members from the Resource-Based Development Advisory Group, discussed in the conclusion of this report.

4) Definition of the regulatory regime in the legal framework

In the absence of relevant legislation, concessions depend on contract language to govern concession obligations.¹⁰⁷ **The open access regime should be set in legislation, defining the roles and responsibilities of the concessionaire and government as they relate to infrastructure maintenance, rehabilitation, and investment.** Arbitration procedures should also be established in the legislation, to ensure enforcement mechanisms and enable the regulatory agency to intervene in case the parties fail to reach an amicable agreement.

Establishing access in Australian legislation

The Australian legislation sets out three methods for ensuring open access for users:¹⁰⁸

- 1) The infrastructure provider voluntarily suggesting access terms, that are then reviewed and approved by Australia's main antitrust agency
- 2) State governments proposing an access regime then approved by the National Competition Council (NCC)
- 3) The access seeker petitioning the NCC to "declare" a facility open for access

The NCC's main function is then to make recommendations to the relevant ministries on the regulation of third party access to services provided by monopoly infrastructure.

5) *A role distinction between regulator and operator precluding political interference*

The lack of a role distinction between regulator and operator presents a serious conflict of interest when the regulator cannot be objective about grievances of access given its status as an interested party to the conflict. An independent regulator is necessary to protect the concessionaire from government whims, to ensure fair and equal treatment of all the users and to ensure that the concessionaire's financial objectives are aligned with the long-term economic objectives of the government's plans. CFM is currently both the operator and regulator; Mozambique would gain in both transparency and efficiency if a regulator would be established as a separate authority from CFM.

Furthermore, to confirm the neutrality of the regulator, *a force majeure provision* is generally included in the concession contract that affords protection to the concessionaire against political actions that may have a materially adverse effect on the project. Private investors can resort to the Multilateral Investment Guarantee Agency (MIGA)'s political risk insurance¹⁰⁹ or other forms of political risk insurance to ensure this protection.

Resolving the regulatory framework of the Beira corridor by leveraging the partnership between companies and public authorities would send a strong signal to donors and investors interested in other infrastructure projects along the corridor such as the US\$2.5bn planned Power Transmission System (CESUL). This strong signal would cast a light on the capacity of the government to plan, regulate, and coordinate the stakeholders who are key to the success of the corridors' development.

¹⁰⁷ http://www.northsouthcorridor.org/media/090330_full_final_report_-_formatted_2_english.pdf

¹⁰⁸ J-A. Gómez-Ibáñez (2010), Coordination vs. Cooperation: The Simple Analytics of Open Access with Illustrations from Railroads, Harvard Kennedy School

¹⁰⁹ www.miga.org/sectors/index_sv.cfm?stid=1534

1.3.5 Spillover benefits from the completion of the CESUL Energy Project

The CESUL power project plans to connect the high power generation potential in Tete province with the load-prevalent southern provinces, while increasing power availability in the central regions.

The backbone project is divided into two phases. The first phase (Phase 1) is the construction of a 1,240km long DC 800kV line for the bulk of the North-South transfer, along with an AC 400kV line that will provide a series of urban centers along the route¹¹⁰ with reliable and low-cost electricity. The total proposed transfer capacity of both lines will be 3,100 MW. The second phase (Phase 2) will double the DC line, bringing the capacity to 6000MW.¹¹¹ (See Figure 3)

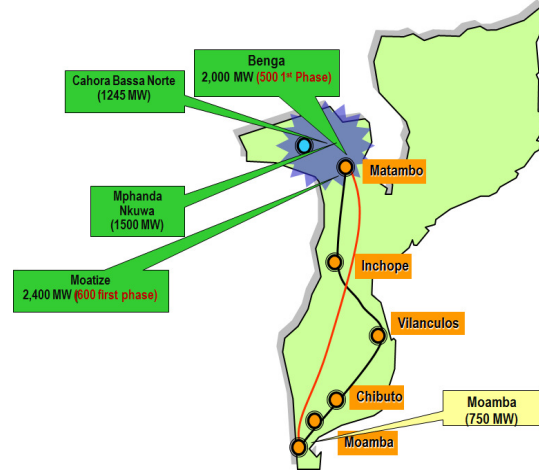


Figure 3. Mozambique Transmission Backbone- CESUL- Source: EDM

Phase 1 of CESUL,¹¹² anchored on the 2,075MW Cahora Bassa Hydropower (CBH) station and the US\$2.9Bn¹¹³ 1,500 MW Mphanda Nakuwa (HMNK) hydroelectric dam,¹¹⁴ will proceed as anticipated after the finalization of the feasibility study due in August 2011. Funding has been secured with the World Bank, the Kingdom of Norway, and the Agence Française de Développement (AFD) to support the 51% EDM share in the project. The other 49% share will be granted to a private partner once the results of the feasibility study revealing the economic viability of the project are released. The negotiation with Eskom, the State-owned South African utility, which is expected to off-take part of the power generated, has also been finalized. The donors, the government, and EDM are confident that Phase 1 will be implemented.¹¹⁵

However, the situation is not as certain for the realization of Phase 2 of CESUL, for which the anchors are the coal-fired power plants developed by Vale and Rio Tinto/Riversdale to use their discarded low-quality thermal coal.¹¹⁶ Although the existing 220kV transmission line to the Matambo substation and on to Bindura (Zimbabwe) and Apollo (South Africa) is sufficient to transmit the power generated by the initial phase of the power plants (300MW for Vale and 250MW for Rio Tinto/Riversdale),¹¹⁷ the completion of both phases of CESUL is necessary to fully exploit the potential of the power plants that

¹¹⁰ Dondo, Vilanculos, Chibuto, Maputo, Marracuene, according to SAPP documentation.

¹¹¹ EDM Presentation, Mozambique Transmission Backbone, September 2010

¹¹² Single DC 800kV line along with an AC 400kV line

¹¹³ SAPP Documentation, Mphanda Nkuwa

¹¹⁴ 61 km downstream from CBH

¹¹⁵ Based on interviews with the World Bank, the National Directorate of Energy and EdM

¹¹⁶ The plan is for independent power producers (IPP) to own the power plants and for Vale and Rio Tinto/Riversdale to enter into a power purchase agreement with the IPP, which would use the companies' discard coal as fuel. While Vale and Rio Tinto/Riversdale had no intention of entering the business of power generation, security of supply of electricity is crucial to the companies, and selling the surplus power not used by the mine to the local and South African markets is another potential profit opportunity.

¹¹⁷ The plan for Vale and Rio Tinto/Riversdale is to respectively produce 600 MW of power (2 x 300MW with net capacity equal to 540 MW) and 500MW (2x 250MW or 4x125MW) before ramping up to 2,400MW for Vale and 2,000MW for Rio Tinto/Riversdale. Half of the initial phase needs the completion of CESUL phase 1 to be transmitted. The ramped up production needs Phase 2. (Source: EdM, SAPP, Vale)

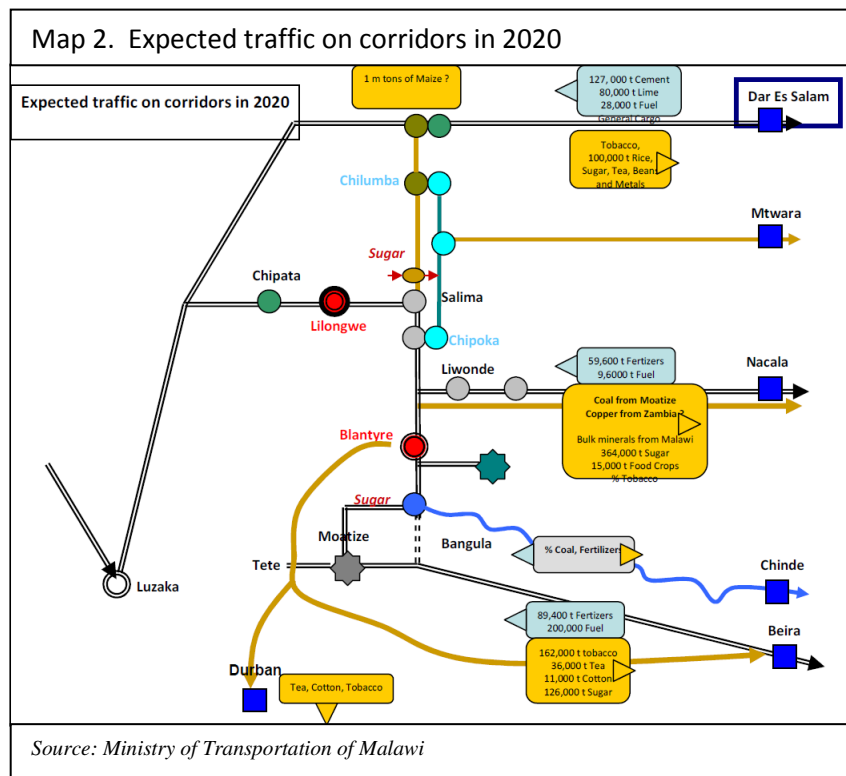
can ramp up to 2,400 MW for Vale and 2,000 MW for Rio Tinto/Riversdale. Likewise, CESUL phase 2 will not be completed if its anchors, the power plants, are not developed and ramped up to a high capacity.

Public private coordination and adequate coordination between CESUL and the development of the generation projects in Mozambique is critical to the success of this backbone project. Though completing Phase 1 of CESUL will be a substantial achievement for Mozambique, completing Phase 2 will still be necessary, as the current availability of electricity in the country is so low (14.3%¹¹⁸), which is a major constraint to sustainable development in the country. Phase 2 will support the Government’s goal to achieve a 20% electrification rate by 2020.

While the success of integrated development along the Beira corridor relies on the coordination of public and private players within Mozambique, the success of the Nacala corridor, running from Mozambique to Zambia through Malawi, is also dependent on the successful creation and operation of critical cross-border partnerships. The following section focuses on the additional complexity the cross border issues place on corridor planning, regulation and coordination.

1.4 Overcoming the cross-border challenge of the Nacala corridor

Historically, there has been a flow of goods and services by rail from the Mozambican ports to Blantyre and Lilongwe in Malawi and the eastern and northern provinces of Zambia. However, shortages of locomotives, unreliable operating procedures on the Mozambican portion due to floods¹¹⁹ and frequent wash-aways on the lines in Malawi have affected service delivery and created negative customer perception of the route.¹²⁰ The situation forced a shift away from rail transportation to road, involving much longer distances and a reliance on the ports of South Africa and Tanzania. This has increased transportation costs in the region. About 55%¹²¹ of production cost is driven by transport cost in Malawi compared to an average of 17% in less-developed countries.¹²²



¹¹⁸ EdM Presentation on CESUL

¹¹⁹ The 77km stretch between Entrelagos and Cuamba wrecked by 2001 floods has been particularly adversely affected.

¹²⁰ World Bank – Trade and Transport- Facilitation Audit- 2004

¹²¹ www.ifrtd.org/en/regions/country_pages/Malawi.php

¹²² Once the required rehabilitation is undertaken, a train would only take 38 hours to travel between Nacala and Limbe at an average speed of 50 to 70 km/hour, compared to the present travel time of 5 to 7 days, at 15 to 20 km/hour.

A successful Nacala rail corridor would unlock the tremendous economic potential in the region. Provided that a proper regulatory and operational framework is put in place, the railway line can significantly lower the cost of transportation for several bulk commodities of the region for which the shortest route to the sea is the Nacala line. These include:

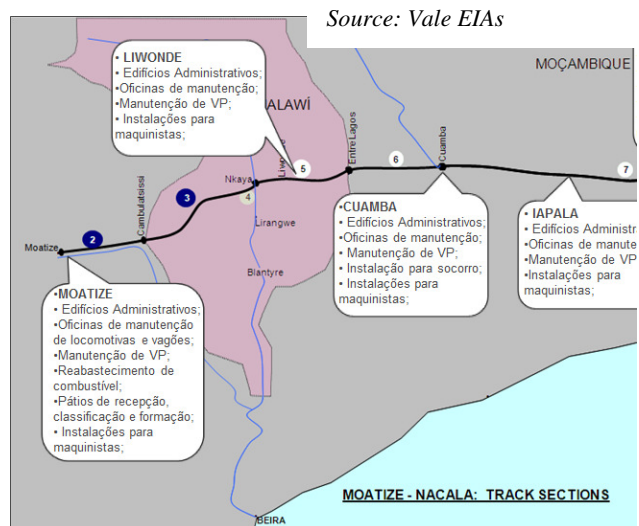
- the expected 324,000 tpa sugar production of Luchenga and the unexploited Mulanje bauxite potential (580,000 tpa)¹²³ of Malawi (See Map 2)
- the high-value Chipata gem and stone mines already linked to the western branch of CEAR
- the nascent but promising forestry industry developing in the Nampula, Niassa, and Zambezia provinces of Mozambique (220,000 ha in Nampula have been granted to Lurio Green resources, 450,000 ha in Niassa have been granted to New Forestry, Chikwete Forestry Norway's Tree Farm and Floresta do Niassa and 140,000 ha have been granted to Tectona and Ntacula in Zambezia).¹²⁴
- the potential biofuel industry of the Mozambican northern provinces, which is likely to take off if transport along the Nacala corridor becomes available.¹²⁵

The current regulatory and operational framework of the Nacala corridor, however, is shrouded in confusion that currently blocks further development along the corridor. Resolving the regulatory and operational arrangements is therefore an urgent priority.

1.4.1 Current regulatory and operational arrangements for the Nacala rail corridor

In 2000, Mozambique and Malawi signed the Nacala Development Corridor Agreement, a bilateral agreement confirming their common understanding for a cross-border operational framework. In 2003, Zambia joined and signed a tripartite agreement with the two countries, therefore ensuring the three contiguous countries affected by the Nacala line are aligned in principle.

In September 2010, Vale became the majority shareholder (51%) of the private investors' share of the consortium, Sociedad de Desenvolvimento de Corridor de Norte (SDCN). The consortium holds 51% of the Mozambican Nacala port and railway concessionaire (the Corredor de Desenvolvimento do Norte (CDN)),¹²⁶ and the Malawian railway



¹²³ Republic of Malawi Ministry of Transport and Public Infrastructure, Data Analysis on Intermodal Corridors for Malawi, Safege Consultants for the European Union and the World Bank, June 2010

¹²⁴ Synopsis of Mozambique forestry sector issues and opportunities for SDI program support, Technoserve, March 2011

¹²⁵ *Energy Policy Journal*, 2009, Marc Schut, Maja Slingerland, Anna Locke. Most of the projects are now in Sofala and Manica provinces, close to the Beira corridor. One of the exceptions is AVIAM's 20.1M in Jatropa production but it is at the port city, Nacala-a-Velha.

¹²⁶ CDN is a 25-year concession that was awarded in 2005 and is renewable for 15 years.

concessionaire (the Central East African Railways (CEAR))¹²⁷. CFM holds 49% of CDN. SCDN has the official seamless concession for both the Nacala port and Nacala railways up to the Zambian border. In April 2011, Vale signed a Memorandum of Understanding (MoU) with Malawi for use of Malawi's rail system as part of the construction of a railway to transport coal mined in Moatize. This MOU echoes the one signed in November 2009.

Though SCDN officially owns the continuous concession and despite the tripartite agreement on the operational framework for the corridor, there remain, in fact, disagreements about sovereignty, customs, and borders issues between Mozambique and Malawi, and consequently the concession is still divided between CDN and CEAR; crews, cars, and services change at the border between the countries. Thus, the functionality of the Nacala rail corridor remains limited.

In addition, Vale and the minority shareholders are divided on issues such as access to finance, freight rates, the sharing of costs, and the allocation of profits. The disagreement, which appears to have stagnated developments even among the shareholders, has resulted in skepticism and rumors about the economic feasibility of Vale's plans to rehabilitate the rail. Specifically, some economists and engineers analyzing Vale's proposed US\$2bn investment to rehabilitate the escarped and high gradient 906 km Moatize-Nacala line and build a new coal terminal in Nacala-a-Velha believe that the rehabilitation is not economically justified when the company could invest the same amount to drastically upgrade the much shorter 575km¹²⁸ Sena line from Moatize to Beira and dredge the Beira port to the required capacity.¹²⁹ Those economists and engineers argue that Moatize's coal deposit is therefore not the right anchor for the Nacala Corridor, as such a large investment will preclude low-cost access to the line for farmers unless the investment is shared by several investors or the farmers' access to the line is subsidized.

With or without Vale's investment, the impact that the Nacala Corridor could have on the development of the region is clear to all stakeholders. Backed by a bankable feasibility study, the Nacala rail corridor could attract other investors such as, IFC, the China and Indian EXIM banks, or other experienced train operators.

Even with the viability and investors resolved, however, the cross-border regulatory and operational framework to ensure continuous rail traffic between Mozambique and Malawi must be resolved in advance of a functional investment along the route. Moreover, such a cross-border agreement could serve as a basis for the other critical cross-border infrastructure projects in the same corridor, such as the power interconnector, which is discussed below in section 1.4.3. With the support of the African Development Bank, the cross-border Nacala road corridor¹³⁰ is about to become a reality. The road network should provide the momentum for completing the cross-border infrastructure of the corridor, including the rail and power networks.

¹²⁷ CEAR is a 15-year concession that was awarded in 1999 and is renewable for 5 years.

¹²⁸ <http://www.bulkmaterialsinternational.com/htm/w20100316.346481.htm>

¹²⁹ The main disadvantage of the Nacala route is the additional distance of 330km over the Beira route. This could translate into an additional US\$120M per year for 18 Mtpa in variable transportation costs (US 0.02cents/ton-km) in addition to the upfront capital costs incurred to upgrade the railways.

¹³⁰ www.afdb.org/.../Multinational%20-%20REV%20AR%20Nacala%20Road%20II.pdf

1.4.2 Implementing a seamless cross-border framework

The tripartite agreement signed in 2000 by Mozambique, Malawi, and Zambia laid the foundation to implement the cross-border operational framework and harmonize the legal and logistical aspects of the rail; however, further steps are still needed.

1) Integrated border and corridor management is necessary to ensure “the process of modernization, simplification, further promotion of international harmonization of border crossing procedures, and increasing transparency of rules and regulations.”¹³¹ This could be naturally done under the auspices of the regional associations: COMESA,¹³² which works toward harmonization of border crossing and customs procedures, and SADC, which promotes structural cooperation with border agencies of neighboring countries.

As expressed by the European Parliament and Council, another transnational entity dedicated to the integration of cross-border territories, about the EU context, “problems affecting the railway sector involve transnational aspects that require action to be taken at EU level. *The lack of coordination in the relationships between Member States and other actors reduces the efficiency of international rail transport, risking a shift from rail traffic to road transport which would result in increased congestion and pollution.* Clarification of the regulatory framework for rail market access in order to facilitate market entry and competition as well as to develop rail service markets, including those linked to rail transport provision, can be better achieved by the Union than by Member States individually.”¹³³

To achieve integrated border and corridor management, the Nacala road corridor project can usefully serve as a model. Mainly funded by the African Development Bank, the project is coordinated by a **Steering Committee (SC)**, under the **Chairmanship of the Director of Infrastructure and Services at the SADC Secretariat**. The SC, meeting at least bi-annually, provides a forum where the responsible Ministries for transport infrastructure in Zambia, Malawi and Mozambique, the Road Agencies, the SADC Secretariat and the financiers can discuss and coordinate road project activities relating to the Nacala corridor,¹³⁴ as well as resolve disputes.

2) In addition to coordination and regular meetings at the public authority level, **consultations with stakeholders are important to ensure transparency** associated with costs and procedures in transport and trade. Setting up a group of stakeholders similar to the Maputo Corridor Logistics Initiative (MCLI) could serve this purpose. **MCLI is a group of infrastructure investors, service providers, and users from South Africa and Mozambique that cooperates closely** with organized business, engages with relevant authorities, and represents the combined views of all users of the corridor and all parties involved in the provision of services in the corridor.¹³⁵

3) Moreover, in order to ensure proper enforcement of the tri-partite agreement, it could be necessary to **establish the binding nature of the Tripartite Agreement's provisions**, including the principle of freedom of transit of cargo and open access, both under international law and domestic law. This option was adopted by the Azerbaijan-Georgia-Turkey Oil Pipeline and was considered to encourage the enforcement of the law (see box).

¹³¹ World Bank – Trade and Transport- Facilitation Audit- 2004

¹³² However, Mozambique would need to re-join COMESA.

¹³³ <http://eur-lex.europa.eu/en/index.htm>. Emphasis added.

¹³⁴ www.afdb.org/.../Multinational%20-%20REV%20AR%20Nacala%20Road%20II.pdf

¹³⁵ Ibid.

Azerbaijan- Georgia-Turkey Oil Pipeline

The three countries signed a treaty that overturns domestic legislation by binding each government to make the Agreement “*effective under its Constitution as the prevailing legal regime of such State in respect of the project under its domestic law and a binding obligation under international law.*”(Article II) Further, each State agrees that if its actions interrupt or otherwise impede, or threaten to interrupt or impede the Project, including the flow of cargo, “*such State shall use all lawful and reasonable endeavors, taking into account democratic, economic, and commercial principles, to eliminate the threat and rectify any interruption or impediment and promote restoration of all Project activities at the earliest opportunity.*”(Article VII, 4)¹³⁶

4) Finally, the Governments of Mozambique and Malawi (and later Zambia) need to jointly devise the logistics solutions enabling corridor development along the railways while ensuring the economic viability of the investment in the infrastructure. Those solutions would call for:

- First, a **clear analysis about which commodities should be transported by railways as opposed to roads**. Generally, the non-time-sensitive bulk commodities such as sugar, cotton, or fertilizers are suitable for rail. The distance and the existing complementing infrastructure are also factors. Thus, the JICA study for the Nacala Port considers that the Mozambican products should be transported by trucks via highways, while containers from Malawi should be transported by railway. Moreover, the forestry potential of Niassa and Zambezia would benefit from access to the Nacala port by railway but it would necessitate the rehabilitation of the Lichinga-Cuamba 267km line and the construction of railroad between Gurue and Cuamba.¹³⁷
- Second, **the formations of clusters that will generate enough traffic to justify multiple carload shipments from points on the line**. Scattered carloads complicate the economics of the rail. Individual carloads bound for Nacala could be delivered to and consigned at locations where they could be assembled onto trains so that they only proceed to Nacala when they constitute a full train. The operational concerns are then reduced to two issues: 1) a unit train capacity issue, meaning that the Nacala concessionaire will have to reserve more capacity for this traffic, and 2) the construction of dry ports and parallel roads to the railways to ensure smooth intermodal capacity.
- Third, an **efficient signaling system at the crossing of roads and railways** to avoid truck and train accidents as well as a scalable, cheaper wireless signaling system to ensure fluid traffic management along the full rail line.

A renewed agreement on the Nacala corridor by Mozambique and Malawi, and later Zambia, would facilitate the critical cross-border arrangements and logistics. Planned infrastructure projects will also benefit. For instance, the Malawi export market could also tremendously benefit from connecting the existing Malawi rail system through Nsanje and Bangula to the extension spur of the Sena line, which would give Malawi a direct rail link to Beira, reducing the current transport costs of US\$79/ton¹³⁸ on the

¹³⁶ Abigail S. Reyes, Protecting the Freedom of transit of petroleum: transnational lawyers making up international law in the Caspian, in Berkeley Journal of International Law, 24.3, p.p. 842

¹³⁷ Synopsis of Mozambique forestry sector issues and opportunities for SDI program support, Technoserve, March 2011

¹³⁸ Republic of Malawi Ministry of Transport and Public Infrastructure, Data Analysis on Intermodal Corridors for Malawi, Safego Consultants for the European Union and the World Bank, June 2010

parallel road network. For Mozambique, this North-South link will contribute to better regional integration and will act as a feeder route to the Nacala corridor.

Reviving cross-border negotiations on logistics and operations could also benefit the stalled power interconnector project, which would run along the Nacala corridor, and would multiply the development benefits of the increased investments of the transport infrastructure. This is discussed in the next section.

1.4.3 Reviving the regional power interconnector along the Nacala corridor

“Returns to cross-border transmission can be as high as 120 percent for the Southern African Power Pool.”¹³⁹

The regional interconnector would provide a critical link between the power generation in Tete Province and the economic potential of the northern provinces along the Nacala corridor, where the current demand is the lowest in the country (59MW¹⁴⁰ in 2008) due to the limited power distribution. The interconnector would complement the North-South CESUL line with West-East transmission. **The shortest and most logical route for the interconnector passes through Malawi, providing the additional benefit of connecting Malawi’s resources with the Southern Africa Power Pool (SAPP) grid (Map 3).** The interconnector is thus mutually beneficial for both countries.

For Mozambique, availability of electricity should be viewed from a regional perspective. Mozambique’s current maximum energy demands are about 1,300 MW annually¹⁴¹ (including Mozal), whereas South Africa consumes 40,000 MW,¹⁴² including 80% of the current capacity of CBH. There is thus an opportunity cost of increased local consumption in Mozambique given that the South African market is so captive, the cost recovery of EDM is negative,¹⁴³ and more funds are needed for increasing power generation capacity and distribution. In this situation, *regional* power off-take, such as the interconnector with Malawi and the SAPP in general, provides the incentives to ensure that installed power generation is scaled up to its potential.

In addition, the alternative to the trans-border interconnector is more costly for Mozambique. Since the lapse of the interconnector discussions, Mozambique has received a new line of credit to assess the feasibility of a transmission line that goes around southern Malawi, to be financed by Mozambique alone. This indirect route would be both more costly (due to the added distance) and would not include any cost-sharing from Malawi.

For Malawi, the proposed new 220Kv transmission line would be able to transmit at least 200 MW¹⁴⁴ in the long run to stabilize Malawi’s power supply, increasing its electricity capacity from 285 MW to 485 MW,¹⁴⁵ supporting economic growth and increasing revenue collection for the Electricity Corporation of

¹³⁹ Ibid

¹⁴⁰ A Renewable Energy Plan for Mozambique, Mark Hankins, September 2009

¹⁴¹ With insufficient supply and long power outages common in the region, many firms use generators to supplement their electricity supply.

¹⁴² <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Evaluation-Reports/12550249-en-Mozambique-Electricity-II.pdf>

¹⁴³ The current national average tariff is US 8 cents/MWh, whereas the long-term marginal cost tariff is US 9.1 cents/MWh.

¹⁴⁴ In the short run, the Interconnector would supply a consistent 50MW of electricity. Prospects for Growth Poles in Mozambique August 2010, The World Bank, Finance & Private Sector Development, Africa Region.

¹⁴⁵ <http://www.engineeringnews.co.za/article/xxx-2010-01-06>

Malawi (ESCOM), the state utility. Indeed, Malawi suffers from a serious power shortfall. 95% of Malawi's power supply presently comes from a series of hydroelectric power plants located on the Shire River for an installed hydro-generation capacity of 282.5MW,¹⁴⁶ but this output can be tremendously limited by several factors. These hydro plants are run-of-the-river generating stations and are highly vulnerable to rainfall fluctuations and drought.¹⁴⁷ Malawi is discussing the construction of new hydroelectric power stations with donors, including Kapichira II, which could put the country in a position to export power to the rest of southern Africa. This option will not however solve Malawi's vulnerability and need for power diversification to ensure power supply stability.

In recognition of this situation, the World Bank has committed US\$200M to a project that connects Malawi to Mozambique and thus to the SAPP, enabling power to be shared across the sub-region. However, the division of the financing of this project into two phases—the first of which brought the power to Malawi and the second of which would connect from Malawi to Nampula, Mozambique—appears to have contributed to the failure of the project. Neither Malawi nor Mozambique stood to gain adequately from the completion of one phase by itself. The proposed project has also been raising concerns in Malawi's Parliament; in the absence of a plan for the country to meet its financial contributions to Mozambique for the first phase of the interconnector, there is strong political skepticism, especially since the Government has a shortage of foreign exchange. The 2007 power interconnection agreement between ESCOM and its Mozambican counterpart, EDM, commits the Malawi government to paying a fixed charge of US\$480,000¹⁴⁸ per month for 20 years that would be cancelled out by payments from EDM to ESCOM when the second phase is built.

Reviving the interconnector project

Malawi's interconnection to the regional electricity grid would be beneficial not only to Malawi and Mozambique, but to the whole Southern Africa Development Community. Transmission interconnectors relieve congestion on the SAPP grid; new transmission interconnectors evacuate power from generating stations to load centers. Moreover, "[p]ooling energy resources through regional power trade promises to reduce power costs. If pursued to their full economic potential, regional trade could reduce the annual costs of power system operation and development by US\$2bn per year (about 5 percent of total power system costs)."¹⁴⁹ There are several examples of successful cross-border interconnector projects (see box) that could usefully underscore the potential of the Mozambique-Malawi interconnector.

Other successful and potentially successful regional interconnectors

Caprivi Interconnector:¹⁵⁰ In November 2010, the US\$3.2bn, 300MW, high voltage Caprivi connection between Zambia and Namibia was officially inaugurated by the Presidents of Namibia, Zambia, Botswana, and Zimbabwe. This will reinforce electricity transmission between Zambia, Namibia, and South Africa, linking northern and western parts of the SAPP. The Caprivi Interconnector has been financed through long-term funding by the European Investment Bank, AFD, and Germany's KfW, with each institution providing EUR 35M support, and an additional EUR 15M interest rate subsidy from the EU-Africa Infrastructure Trust Fund. This subsidy reduces the overall cost of the loans from the three financing institutions for Namibia and is motivated by the significant regional benefits of the project, which should not be met by the Namibian tax payer alone, according to the fund.

¹⁴⁶ allafrica.com/stories/201103010030.html

¹⁴⁷ Heavy floods along the Shire can damage a plant as happened to the Nkula B station in 2003.

¹⁴⁸ World Bank Interconnector, Facts and Figures and allafrica.com/stories/201103010030.html

¹⁴⁹ V. Forester, C. Briceno-Garmendia, *Africa's Infrastructure: A Time for Transformation*, 2010, World Bank and AFD

¹⁵⁰ <http://www.eib.org/projects/press/2010/2010-196-southern-africa-electricity-cooperation-boosted-through-european-funded-950km-caprivi-interconnector-inaugurated-today.htm>

ZIZABONA Interconnector:¹⁵¹ Following the successful commissioning of the Caprivi Interconnector, utilities of the four countries, namely, Zimbabwe's Electricity Supply Authority, Zambia's Electricity Supply Corporation, Botswana's Power Corporation and Namibia's Nampower have embarked on a US\$300M regional transmission project. *A special purpose vehicle will be created to house the regional transmission company and all four utilities would be able to register the joint venture company in their respective countries.* Private investors would also be able to take up equity in the regional transmission network. Norconsult, a Norwegian consultancy has been appointed to recommend a specific framework to be used by the four utilities. The AfDB, Development Bank of South Africa (DBSA) and the World Bank have indicated their willingness to bankroll the transmission project.

Given the regional importance of the interconnector, it is in Malawi and Mozambique's interest to revisit the proposed project, and to find terms that are mutually agreeable. It appears that funding remains available to support the project, including from the World Bank and from Norway.

Some elements of a renewed negotiation could include:

- 1) treating the financing of the interconnector as a single project: each phase of the project would be supported by a **common enterprise** (such as a joint venture between utilities), supported by development partners and the EU-Africa trust fund.
- 2) getting the support of SADC heads of state, in order for **SAPP to take on a coordinating role**. For instance the SAPP coordination center has been appointed as project coordinator of the promising ZIZABONA and is a convener of the heads of states of the relevant countries.
- 3) **a well-packaged project**, balanced from the viewpoint of both utilities, that can be used to attract equity and development banks, as with ZIZABONA. The African Development Bank¹⁵² and the African Union are the natural organizations to take the lead on the initiative. The Norwegian Embassy, endorsing the interconnector, could transfer the experience of the Norwegian consultancy advising on ZIZABONA.
- 4) **a clear explanation for the public about the mutual benefits of an interconnector to both Mozambique and Malawi.**
- 5) exploring **complementary internal transmission and distribution infrastructure.**

The packaged project would have to resolve how to rehabilitate and expand cross-border transmission infrastructure, harmonize regulations and system operating agreements, and create a market that enables appropriate pricing of excess energy. The cost of such preparations can be up to 10% of the project according to the World Bank's Infrastructure team, but is a critical step to enabling regional trade and sustainability of power generation development.¹⁵³

1.4.4 Call for connecting the Nacala corridor to the SEACOM and EASSy submarine cables

Rail and power network intensification, which are key to an enabling business environment, should be complemented by the connection of the Nacala corridor to the SEACOM and EASSy submarine cables whose landing points are currently only in Maputo, imposing a constraint on business development along the corridor.

¹⁵¹ <http://www.sardc.net/Editorial/sadctoday/view.asp?vol=708&pubno=v11n2&page=ENERGY>

¹⁵² The AfDB has, to date, invested some US\$6bn in infrastructure in the SADC region, 42% of which was put into the transportation sector. It is the only institution financing regional operations in Mozambique, and this project will benefit from the Bank's vast experience in implementing multinational projects on the continent. (Source: AfDB)

¹⁵³ Forester Vivien, Cecilia Briceno-Garmendia, Africa's Infrastructure: A Time for Transformation, 2010, World Bank and AFD

Through its landing point in Maputo, Mozambique is connected to two fiber optic cables:

- SEACOM, the first broadband submarine cable system along the eastern and southern African coastlines, bringing high quality and affordable Internet. SEACOM connects Mozambique with South Africa, Tanzania and Kenya; it is privately funded, and it is assisting communication carriers in south and east Africa through the sale of wholesale international capacity to global networks via India and Europe.¹⁵⁴
- EASSy, a 10,000km submarine 4.72Tbps fibre-optic cable system deployed along the east and south coast of Africa to service the voice, data, video, and Internet needs of the region. It links South Africa with Sudan via landing points in Mozambique, Madagascar, the Comoros, Tanzania, Kenya, Somalia, and Djibouti. The system is owned and operated by a group of 16 African (92%) and international (8%) telecommunications operators and service providers.¹⁵⁵

Connecting the country to these two fiber optic cables enabling equal and open access to inexpensive bandwidth is integral to the country economic growth. The development of the Nacala corridor would be bolstered by another landing point in Nacala, as well as by the construction of terrestrial fiber backhauls to link Malawi and Zambia to the cable.¹⁵⁶ Resources are needed to support this expansion.

2. Leveraging the natural resource sector for economic diversification

Inadequate investment in the long-term maintenance and expansion of crucial infrastructure in sub-Saharan Africa has been a major obstacle for unlocking and expanding mineral-based linkages across the continent. Focusing the efforts of the public and private players to solve the infrastructure issues described above is a prerequisite to enable the path to a diversified economy.

The geographic location of Mozambique, the infrastructure potential as well as its mineral wealth puts Mozambique in a unique position to accelerate the path to economic diversification and growth. Contributing to the transformation of a natural resource-based economy to a diversified economy is in the mutual interest of mining investors and governments. The emergence and increased sophistication of local businesses widens the scope for local procurement, allowing a mining firm to reduce costs¹⁵⁷ and increase flexibility. This is particularly true as local businesses move into higher-skilled activities and begin to compete with one another.

To optimize mega-project investment, emphasis must be given to improving the capacity of the supply chain and of local small- and medium-sized enterprises (SMEs) to source goods and services locally.¹⁵⁸ Prakash Ratilal, president of Moza Banco, commented that industries should “give priority to the micro-economy, make use of natural resources and locally available capabilities, and promote national initiatives,” and that “small and medium projects must be pushed forward with the support of the state and the donors.”¹⁵⁹

¹⁵⁴ Adapted from <http://www.seacom.mu/index2.asp>

¹⁵⁵ Adapted from <http://www.eassy.org/>

¹⁵⁶ EASSy investors are considering the option of terrestrial fiber according to their website.

¹⁵⁷ Chevron Nigeria reported a savings of over US\$600,000 per year on machinery by improving the supply chain SMEs capacity in mechanics and other factors of production. Chevron Nigeria website, <http://www.chevron.com/countries/nigeria/>

¹⁵⁸ Jenkins, Beth, Anna Akhalkatsi, Brad Roberts, and Amanda Gardiner. *Business Linkages: Lessons, Opportunities, and Challenges*, IFC, International Business Leaders Forum, and the Kennedy School of Government, Harvard University, 2007, p.17

¹⁵⁹ Respected figures hit government response to poverty, inflation, *Mining Weekly*, Jan 2011

The Mozal linkage program has presented some successful indicators, such as that annual local purchasing from Mozal-affiliated SMEs increased from US\$5M to \$22M from 2002 to 2009, and 72 companies were trained and received a supplier contract.¹⁶⁰ However, without more sustained support, subsequent linkage development that could occur between the first level of suppliers supporting the mine directly and the suppliers supporting them has not been realized.

Indeed, achieving economic diversification through upstream and downstream linkages requires an industrial policy focused on investing in human resources (see 2.1.1) and improving the investment climate (see 2.1.2). The policy should be based on a value-chain approach (see 2.1.3), and constantly engaging with the mega-projects on possible collaborative actions such as jointly setting up a National Linkage Center to monitor the developmental impact of the upstream linkage program (see 2.2) and a Competitiveness Commission to explore downstream opportunities (see 2.3). Ensuring the multiplier effect of the extractive industry on the rest of the economy necessitates a strong political will to build the sustainable entrepreneurial base to service local, regional, and export markets that the extractive industry can create if the public institutions and business-enabling environment are in place.

2.1 Necessary industrial policies to unlock the inhibitors of value addition, diversification, and inclusive growth

2.1.1 Targeting the human resource constraints

The new mineral sector in Mozambique presents opportunities to improve vocational training through public-private partnerships. Historically, Mozambique has had low funding levels¹⁶¹ in vocational training, leading to the skill deficit the country faces today. Nearly 80% of the workforce has not completed upper primary school. In addition, the generally weak management capacity at vocational and training schools¹⁶² contributes to the inefficient use of resources and limits public training providers from responding to the needs of the local economic environment.

The Technical Education and Vocational Training (TVET) system, which is responsible for shaping the skills profile in the labor market, has been slow to respond to changing labor market demands. Thus, despite the economic potential of the country, and in particular along the Nacala and Beira corridors, the national *official*¹⁶³ unemployment rate remains high at 21%,¹⁶⁴ and many of the 300,000¹⁶⁵ young people entering the labor market annually enter the informal market.

In 2006, in response to the inefficiency of the technical training structures, the government launched a reform to bring vocational training programs under a single planning framework, as opposed to distinct ministries' plans. This reform, led by the National Public-Private Commission for TVET Reform (COREP), is committed to transforming its current curriculum-based TVET system into a system based on occupational standards to ensure that the private sector influences the definition of competencies and training content.

¹⁶⁰ Jaspers Frans-Jozef, Shira Mehta Developing SME through Business Linkages- the Mozlink Experience- IFC, 2007

¹⁶¹ The budget for vocational training in 2011 is one-third of the budget for vocational training in 2010.

¹⁶² 60% of teachers are under-qualified and 90% have no practical experience. Until 2008, there was no technical teacher training institution, and the best teachers left for better-paid jobs in the private sector.

¹⁶³ The Debt Group assesses that this number goes up to 60% if the "working poor" are taken into account.

¹⁶⁴ Prospects for Growth Poles in Mozambique, August 2010, The World Bank, Finance & Private Sector Development, Africa Region.

¹⁶⁵ PARP 2010-2014.

Given current limitations and the underfunding of the public system, as well as the incorporation of the private sector in the reform, mining and energy investors have an opportunity to have a significant impact in the improvement of the TVET system, using their expertise to develop key skills for the regions. Vocational training in geology, mining, minerals processing, and extractive metallurgy could broaden the potential for upstream and downstream linkages from the extractive industries, develop the aptitude of the local labor force, and ensure further diversification and growth of the economy.

A constructive long-term engagement with the extractive industries to ensure their contribution to TVET necessitates strong coordination between the Ministry of Mineral Resources (MIREM), the Ministry of Education, and the Ministry of Labor. **Under a coherent policy framework and strong public leadership**, the support of the companies can extend beyond bringing short-term financial resources (such as for the rehabilitation of school infrastructure). Indeed, companies cannot replace local institutions. Therefore such a policy framework could seek:

- **clear and transparent guidelines for implementation of the reform at the local level;**
- **a sustainable funding strategy for TVET**, to address the decrease in the budget allocated to vocational training; this strategy could be inspired by, for instance, Malawi's TVET fund, based on TVET levies imposed on public and private employers¹⁶⁶;
- **an ambitious plan for the training of professors**,¹⁶⁷ funded by pooled public, private, and donor resources;
- **a strong and long-term involvement of the mining companies** in the management council of the existing TVET colleges and in the design of their curricula;
- **a synergy and mobility** between the existing initiatives and institutions related to the extractive sector and the related sectors, to broaden the scope of curricula and expertise available to students. For instance, collaboration could be fostered among:
 - o *The Instituto de Geología e Minas (IGM)*¹⁶⁸
 - o *The Institute Superior Politécnico of Tete* developing courses in mining
 - o *The Master in Geology at The University of Eduardo Mondlane*
 - o *The training program in geology and mining for civil servants* that MIREM is designing
 - o *The Engineering Laboratory of Mozambique (LEM)*
- **a knowledge-sharing forum to share best practices from programs throughout Mozambique**, in order to incorporate and expand on the lessons learned from initiatives of the national reform effort as well as from corporate initiatives, such as the Ayr-Petro Nacala Project¹⁶⁹ and Lurio Green Resources in Niassa, which plan to invest in the training of their local staff through an ancillary training school. Chiquita Brands is investing US\$55M in Nampula and developing a specialized agro-training center in the Nacala corridor.¹⁷⁰

¹⁶⁶ In Malawi, the TVET fund subsidizes the public TVET programs; as a result, there has been some success at integrating more students from poor districts in the recent years. The income of the fund has more than tripled in the past five years; in 2008, 550 companies had contributed to the levy. For Malawi, this levy has been a way to leverage the private sector to ensure sustainability of the TVET system. "The Education System in Malawi" World Bank Working Paper N°182. 2010.

¹⁶⁷ 60% of teachers are under-qualified and 90% have no practical experience. TVET in Mozambique: Trends in Challenges, 2008, Ministry of Education.

¹⁶⁸ IGM is a technical training school of secondary level in Tete, which has recently been in partnership with Canada's Education for Employment program to strengthen the relevance of curriculum and skill sets and with Vale for rehabilitation. The Canadian Cooperation, in particular, developed a new program in topography upon a survey done with the mining enterprises of Moatize that expressed the needs to develop this competence.

¹⁶⁹ Prospects for Growth Poles in Mozambique August 2010, The World Bank, Africa Region

¹⁷⁰ Ibid.

Furthermore, the Nacala corridor presents an opportunity for cross-border harmonization and best practice sharing in terms of vocational training. An increased and harmonized level in vocational training between Mozambique and Malawi, along the Nacala corridor, could contribute to the integration of the sub-region job market where professional opportunities are different and complementary. For instance, while Tete and Nampula offer a large resource-based supply chain market, Blantyre offers a wide range of services that do not exist in Tete, such as business consultancy and training services, several programs focused on building SME capacity, well-established commercial banks and several export-oriented textile, chemical, plastic, and metal product firms.

2.1.2 Enabling the business environment

Mozambique has undertaken much-needed legislative and administrative reforms easing business, protecting investors, and adding flexibility to labor regulations. Yet, Mozambique's business environment remains restrictive with a global ranking of 126th out of 183 (in terms of ease of doing business) and a regional ranking within the Southern African Development Community (SADC) of 11th out of 14th in the 2011 Doing Business Indicators.¹⁷¹ Insufficient capital, shortage of qualified personnel, delays in exporting/importing goods and high transport and power costs cause serious inefficiencies in the private sector.¹⁷² The investment climate is still a bottleneck for entrepreneurs and the particularly high cost of doing business in the formal sector has triggered a large informal sector.

Most firms, especially SMEs, cite access to finance as the heaviest constraint to business growth in a 2007 World Bank Survey.¹⁷³ The banking sector is only slowly extending the branch network beyond the capital to the northern and central regions.¹⁷⁴ According to the AfDB, in the Mozambican traditional financial system, "the rates are only bearable for short-term, high margin trade operations—not for agriculture and industry."¹⁷⁵ The banks enjoy these wide margins,¹⁷⁶ owing to limited access and high exposure to credit risk determined by a poor domestic lending environment.

2.1.3 Shifting toward a value-chain approach

The business community in Mozambique as well as the literature about private-sector development in the country¹⁷⁷ often laments the absence of "a sense of the need to think in terms of value chain, training, etc."¹⁷⁸ Since the remarkable success of the government's 2001 policy to support the entire value chain of cashew nut production, including strong substantial technical and business support for new processing factories and restrictions on exporting unprocessed nuts, there has not been a similar initiative in other SME value-chain development.

¹⁷¹ Doing Business 2011 Indicators rank Mozambique at 126th out of 183 countries for the ease of doing business: dealing with construction permits (which includes access to land), employing workers, registering property, trading across borders, and closing business are among the most costly areas for companies.

¹⁷² Borgarello Andre and al., What Hinders Small and Medium Entrepreneurs in Mozambique? I Quaderni della Cooperazione Italiana, August 2004.

¹⁷³ <http://www.enterprisesurveys.org/ExploreEconomies/?economyid=133&year=2007>

¹⁷⁴ Half of the 219 branches of all banks in the country are concentrated in Maputo province.

¹⁷⁵ Mozambique Private Sector Country Profile (2008) African Development Bank

¹⁷⁶ Fee income accounted for 43% of the income of the banks in 2005 and 2006.

¹⁷⁷ See for instance Borgarello Andre and al., What Hinders Small and Medium Entrepreneurs in Mozambique? I Quaderni della Cooperazione Italiana, August 2004;

¹⁷⁸ Mozambique's Elite – Finding its Way in a Globalized World and Returning to Old Development Models, Joseph Hanlon, and Marcelo Mosse, September 2010, UNU-WIDER, Working Paper No. 2010/105

Currently, the growth of SMEs depends on distinct, fragmented programs, pursued by government, donors, NGOs, and international organizations; however, there is a substantial opportunity to build an SME-based resource linkage industrial cluster around the mega-projects in the Zambezi Valley. To maximize the opportunities presented by the mega projects, a clearer policy for SME development¹⁷⁹ could usefully be formulated alongside structural reforms for the business environment, to support value-chain and industrial clusters rather than individual projects; this would help to achieve more sustainable business growth and enhanced economies of scale.

2.2 Collaborative approach through a National Linkage Center

A clear, coherent policy for SME development could be assessed by a **National Linkage Center** led by Mozambique's Institute for the Promotion of Small and Medium Sized Enterprises (IPEME), the Institute for Export Promotion (IPEX), supporting export-oriented SMEs, and/or the Center for Investment Promotion (CPI). This consortium would be composed of research institutes and universities, which could assess the needs and potential for regional SME-development; government agencies, which could set national priorities for local content requirements, SME output and priority sectors; and the private sector, which could contribute a sensitive diagnostic of cost-effective local industrial procurement over time.¹⁸⁰ The Center could build on the database created and maintained by CPI of 200 SMEs based in Tete. The Resource-Based Development Advisory Group, discussed in the conclusion of the report, could provide comparative analysis and technical expertise.

The objectives of this consortium could address the following four aspects of SME development: identifying the right value chains (see 2.2.1), measuring the value-addition (see 2.2.2), setting up corporate procurement policies (see 2.2.3), and promoting public-private funded initiatives (see 2.2.4).

2.2.1 Identifying the right value chains

Extractive companies generally fulfill their "local content" requirements by investing in local markets and businesses that already exist; in which technological and capital equipment requirements are low and/or are labor intensive; and in which operational risks associated with the procured goods or services are low. Typically, this means that companies often invest in services (e.g catering and security), maintenance (e.g. air conditioning and small vehicles maintenance), and distribution (food supplies and uniforms).

Although they contribute to local employment, these local investments do not contribute to any diversification of the economy and constitution of value chain of linkages. These low-skilled services generally do not necessitate a chain of suppliers to support them, and thus do not have any multiplier effect on economic development.

One potential area of upstream linkage development is in the field of *light engineering*. With the proper training and policy support, there are various mining-related opportunities for value-chain development and manufacturing skills-building that can leverage the industry and build capacity in the

¹⁷⁹ According to the *National Strategies for the Development of Small- and Medium-Sized Enterprises in the Republic of Mozambique* developed by UNCTAD, SME have to be carefully defined in order for the policy scope to target the right numbers of companies and maximize the distribution of resources.

¹⁸⁰ Total Indonesia, for instance adopted a policy ensuring that procurement decisions take into account the cost-benefit over time of sourcing from a local firm against an international firm.

Mozambican workforce; opportunities include welding; the production of tools and light equipment like pipes, pots, and spare parts; waste management; housing and road construction; and explosives. For instance, South African BME¹⁸¹ is building plants in sub-Saharan African countries for the manufacturing of emulsion explosives, used in floor blasting for coal exploration.¹⁸²

2.2.2 Measuring the value addition

The consortium could develop clear local content milestones (5-, 10-, 15-year targets) for all mining concession contracts in order to maximize local value addition,¹⁸³ a key contribution of the mega projects to local development.

Due to policies such as those of Mozal and Vale, which require that for some contracts tendered, only firms established and registered in Mozambique are allowed to bid, South African headquartered companies have established subsidiaries in Mozambique to capture these contracts. As the Governor of the Central Bank of Mozambique noted, “some South African companies had set up establishments in Mozambique that simply exist to sell South African goods.”¹⁸⁴ In the case of Mozal, on average, about two-thirds of expenditure spent on “Mozambican” companies has gone into imports of raw materials and intermediate goods, spare parts, equipment, energy, and fuel from South Africa.¹⁸⁵ In these cases, local value addition was lower than anticipated.

Looking at the total added value to the economy over the life of the project, and how companies’ procurement policies affect those goals, will help guide public and private policies to promote local value addition. A complementary solution may be to establish **import duties on consumables inexistent in Mozambique, which can act as an industrial development instrument. Although exemptions for capital equipment may be justified, they can impede upstream linkages when they are applied to consumables.**

2.2.3 Setting up corporate procurement practices

What appears to be a condition *sine qua non* of a successful corporate linkage policy is an adjustment to complex procurement policies¹⁸⁶ that can deter small local firms from bidding for work contracts; amended policies might include: 1) longer contract periods to enable emerging businesses to justify the acquisition of capital equipment, 2) simplification and translation of tender procedures and contracts into the local language, 3) unbundling contracts in smaller packages to increase the likelihood of local enterprises being able to bid successfully for the work and reserve some capacity for other contract providers, and 4) requiring subcontractors to engage local firms in their supply chain and thus transferring and promoting the responsibility of local content further down the supply chain.

¹⁸¹ BME is the leading supplier of explosives to the South African open-pit mining and quarrying industry.

¹⁸² <http://www.miningweekly.com/print-version/local-explosives-company-supplies-electronic-detonators-to-africa-2008-07-11>

¹⁸³ The Utilization of Mineral Wealth for Development Purposes in South Africa, Paul Jourdan, October 2010

¹⁸⁴ <http://allafrica.com/stories/201102010266.html>

¹⁸⁵ Branco, Carlos, Nicole Goldin. *Impacts of the Mozal Aluminium Smelter on the Mozambican Economy*, independent evaluation, September 21, 2003

¹⁸⁶ Jenkins, Beth, Anna Akhalkatsi, Brad Roberts, and Amanda Gardiner. *Business Linkages: Lessons, Opportunities, and Challenges*, IFC, International Business Leaders Forum, and the Kennedy School of Government, Harvard University, 2007

Amending the procurement policies as well as planning the value-addition strategy, as discussed above, need to be envisioned before the construction phase starts, as the construction phase is the most labor-intensive phase of the life of a mine.

2.2.4 Promoting public-private-funded initiatives

1) Enterprise Centers, Center for Knowledge Transfer and Business Incubators: a number of extractive industry firms¹⁸⁷ have used enterprise centers or business incubator models to provide one-stop shops for SMEs to access contract opportunities, e-procurement systems, training courses, information and communications technology tools, and business development services. These centers can also serve as a business incubator for micro-entrepreneurs. Such a business incubator already exists in Mozambique, hosted by the University of Eduardo Mondlane (called MICTI¹⁸⁸), and could be usefully expanded, especially in Tete, where the resource sector will provide a number of opportunities for SME contracts.

The Ministry of Science and Technology invited the University of Eduardo Mondlane business incubator (MICTI) to share its experience and to provide assistance to two new government-sponsored incubators in Chockwe and Lichinga. An extension of the business incubator model in Tete could be supported by UNDP's Local Economic Development Agencies Network, which promotes economic development at the local level, with private-sector support from the mega projects operating in the region. In fact, Mark Davies, Founder of Ghana's BusyInternet incubation model, who developed a feasibility study for a business incubator in Maputo, assessed that an incubator would cost as much as \$4.9M.¹⁸⁹ Business incubators would therefore benefit from pooled financing from various private-sector companies and development partners engaged in Tete.

2) Structured SME collaboration: **A long-term integrated government policy and collaboration among the private sector are critical for ensuring the sustainability of skill-building and supply-chain development;** "building national capacity requires collaboration, even between competing companies, in marketing, research and development, and other areas."¹⁹⁰ For example, despite Mozal's investments in SME development, the available contracts were too short-term for the firms to be willing to upgrade and modernize.¹⁹¹ Moreover, there were no other buyers other than Mozal to sustain the demand for the high-quality products. As a result, many of the upgraded capacities were lost after the end of individual contracts, and benefits to the local workforce were not sustained. Therefore, firms and the government should strategize about a mutually beneficial industrial strategy that coordinates skills-training with demand over time.¹⁹² This structured collaboration could be facilitated by the business associations, CTA and ACIS, and might benefit from the experience of Malawi and South Africa's SBP Business bridge program (see box).

¹⁸⁷ Such as BP in Azerbaijan, Exxon in Chad and Rio Tinto in Australia.

¹⁸⁸ Mozambique Information and Communication Technology Institute.

¹⁸⁹ www.infodev.org/en/Document.439.pdf

¹⁹⁰ Mozambique's Elite – Finding its Way in a Globalized World and Returning to Old Development Models, Joseph Hanlon, and Marcelo Mosse, September 2010, UNU-WIDER, Working Paper No. 2010/105

¹⁹¹ Branco, Carlos, Nicole Goldin. *Impacts of the Mozal Aluminium Smelter on the Mozambican Economy*, independent evaluation, September 21, 2003

¹⁹² *Ibid.*

Malawi and South Africa's SBP¹⁹³ business bridge program provides a forum where members network with, learn from, and mentor their peers; share sector-specific information on administrative and logistical issues; and identify opportunities for members of sector-specific groups.¹⁹⁴

3) Joint-Financing Mechanisms: The above-mentioned consortium of government, investors, and academia could also partner with local financial institutions to promote access to finance for the SMEs.¹⁹⁵ Mining companies would be especially encouraged to create a Supplier Finance Facility, whereby loans are made out of the bank's own capital, and the bank takes responsibility for monitoring the performance of its clients (the suppliers contracted by the mines) and ensuring that they make timely repayments. The bank's administrative costs, as well as the bank's needs for guarantee, are met by the facility so that 1) the loans can be provided at an affordable interest rate (lower than the current excessively high rates), and 2) the contracts with the mines serve as a guarantee or collateral.¹⁹⁶

Another interesting and related solution is creating joint-ventures between mining companies and local SMEs such as done in South Africa and Trinidad and Tobago.¹⁹⁷

Anglo American's Zimele program: improving access to finance and business management
In South Africa, this program holds minority stakes in local black-owned enterprises and influences their strategic direction via its board representation. In addition to equity investing, the program facilitates the provision of loan to meet companies' additional financial needs. It has invested in roughly 150 enterprises that have employed over 2200 people. The survival rate of these companies is 72%.¹⁹⁸

2.3 Exploring downstream linkages

Mineral-based intermediate and finished products generally provide a more stable economic base than raw materials, as they are not as vulnerable to terms of trade decline and price volatility.¹⁹⁹ Moreover, a SADC study showed that the value of the mineral/element contained in downstream products relative to the raw mineral is 400 times, on average: 8 times for coking coal into steel, 38 times for iron in fabricated tanks, 117 times for copper in cathode copper and 5000 times per carat in a polished diamond.²⁰⁰ Therefore, it is advisable to explore the potential of downstream linkages with the mining industry in Mozambique, focusing particularly on intermediate products (which are less capital intensive than finished products).

¹⁹³ Formerly known as the Small Business Project.

¹⁹⁴ SBP, *Small Business Development in South Africa: Time To Re-Assess*, August 2009, <http://www.sbp.org.za/index.php?id=23>.

¹⁹⁵ B. Jenkins, A. Akhalkatsi, B. Roberts, A. Gardiner. *Business Linkages: Lessons, Opportunities, and Challenges*, IFC, International Business Leaders Forum, and the Kennedy School of Government, Harvard University, 2007

¹⁹⁶ This program could be an extension of the District Development Fund, which gives loans to projects that will create jobs. The current failure to repay (currently only 12% are repaid) undermines the long-term sustainability of the existing scheme. The District Development Fund would need technical assistance in transparent financial management to proceed effectively with the promotion of employment and economic development at the district level. There are already several financial institutions building SME units, such as ABC Bank, BCI, BP Internationals and the donor-sponsored non-bank GAPI.

¹⁹⁷ "British Petroleum established two joint ventures to develop its supply chain in Trinidad and Tobago, enabling the company to retain local engineering and fabrication firms for the construction of its two more recent offshore platforms" (Source: B. Jenkins, A. Akhalkatsi, B. Roberts, A. Gardiner. *Business Linkages: Lessons, Opportunities, and Challenges*, IFC, International Business Leaders Forum, and the Kennedy School of Government, Harvard University, 2007).

¹⁹⁸ Ibid.

¹⁹⁹ Jourdan Paul, *The Utilization of Mineral Wealth for Development Purposes in South Africa*, October 2010

²⁰⁰ SADC, *Study on Opportunities for Value Addition to Minerals*, June 2000. These numbers compare prices without adjusting for tonnage.

However, there are a number of challenges to downstream development for both host countries and companies. Indeed, “the challenge for bulk commodity beneficiation is the pricing of intermediate products (coke, steel) which challenges final fabrication (steel wire, gas bottles...) rather than the actual mined commodity prices.”²⁰¹ Therefore, the production of intermediate products will only take place if they can be manufactured cost-effectively, hence the fundamental need to invest in skill-building and human capital.

The importance of investing in human capital is increased by the fact that the coal mining companies in Tete are closely integrated with their clients, and switching to new processes can be costly for a company.²⁰² For instance, Vale is an important shareholder of several of their clients (steel producers) in Brazil. In such closely integrated metallurgical value chains, intermediate products such as coke are made at the clients’ site, which leaves few opportunities for Mozambique to enter this value chain.

Nevertheless, opportunities are presenting themselves for possible downstream development. Australia-based Baobab Resources Ltd. expects to confirm by mid-2011 that its exploration concession in Tete will present about 500 million tons in proven resources of magnetite iron ore.²⁰³ Baobab, which is 7% owned by the International Finance Corporation (IFC), could contemplate processing or beneficiating the iron ore on site and even building a steel plant. Cheap hydroelectricity, coking coal, and proximity to two railway lines appear to be encouraging factors for beneficiation. Smelting the iron ore into steel could cost up to US\$4bn according to Baobab, which is still awaiting the final conclusions of the feasibility study. The managing director of the company has said, “a lot of companies our size wouldn't look at smelting but because of the IFC and our long term view of Tete, we can as a viable possibility.”

2.3.1 Collaborative approach for a competitiveness commission

The potential for Tete to become the host of an industrial cluster based on the steel value-chain merits the formation of a government-led commission to assess the competitiveness of the value-chain, the potential for beneficiation in Tete, and necessary public and private policies to support such downstream development, if feasible. This commission, hosted at MIREM, could emulate the South African Beneficiation Economics Directorate.²⁰⁴ It could:

- leverage Baobab’s declared intention to embark on value added activities;
- require and review feasibility studies from the companies mining coking coal and iron ore for downstream development, coking plants and ferroalloys, cement or aluminum smelter plants;
- commission an independent expert to conduct a feasibility study to identify the potential for value-added activities by analyzing the synergy of costs and revenues from all of the mining projects in Tete province; and
- convene all the mining companies of the steel value-chain from Tete to establish dialogue and engagement to align public and private expectations.

This commission, with support from the Resource-Based Development Advisory Group (discussed in the conclusion of the report), could also conduct feasibility studies to put in place the right fiscal and investment policy to support downstream development. From a fiscal point of view, the government could assess the usefulness and desirability of tax incentives, such as high royalties on ore or lower

²⁰¹ Minerals and Africa’s development, 2010, Africa Union

²⁰² For instance, Vale blends its coal in Mozambique before selling it to steel makers that bake the coking coal themselves.

²⁰³ “DJ Baobab Resources: Eyes 1B Tons Of Mozambique Iron Ore Reserves”, Dow Jones Newswires, February 17, 2011

²⁰⁴ www.dmr.gov.za/Policie.../Beneficiation_Economics.html

royalties on concentrates and metals, or tax disincentives, such as export taxes on coking coals similar to the one imposed in Zimbabwe on chrome ore,²⁰⁵ to encourage value-added processing in Mozambique.

In order to adequately prepare for the potential of downstream development, the commission could inform broader multi-sector policies to lay the necessary foundation for eventual downstream development, such as prioritizing skills-building and infrastructure development. Indonesia's recent experience promoting beneficiation reveals that a scheduled approach to building a downstream industry must focus first on investment in infrastructure and human capital (see box).

Indonesia: the Beneficiation Law is not enough

The 2009 Minerals and Coal Law stipulates that all mining companies are obliged to process and beneficiate their mining products in the country by no later than 2014. Despite this law, the Association of Indonesian Mining Professionals declared recently that few companies would comply with the law because the government was not seeking the best way to develop the capacity of upstream industries in supplying raw materials for downstream industries and was not accelerating the development of energy and transport infrastructure. In addition, a working group from the association is currently assisting the Energy and Mineral Resources Ministry in deliberating a new ministerial decree on detailed rules and strategies to develop mining downstream industries.

This scheduled approach should be articulated in a long-term development strategy for the country, as discussed further in Chapter 4.

²⁰⁵ In August 2010, the Zimbabwe Government increased the export tax on unprocessed chrome from 15% to 20% to encourage value addition on chrome ore and fines. <http://allafrica.com/stories/201008101045.html>.

3. Conclusion and summary of recommendations

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Aspirational 10- year map and comprehensive database	<p>Planning tool for Transport and Energy Sector (to identify potential for shared platforms with mega-projects, to anticipate risks of congestion on corridors, to revive stalled projects, to invest in missing links) Backed by data survey and transport sector statistics</p> <p>Can motivate the creation of a fund to facilitate more investments in infrastructure and in operations and maintenance of it</p>	MTC, COCEP, MPD	National Statistics Institute Current and Future Investors in infrastructure	WB, AfDB, GSDI
Completing two key trunk infrastructure of the Beira Corridor by leveraging partnership	<p>Renewing the Sena line concession arrangement by implementing the multi-user model, maximizing public interest and economic viability</p> <p>Renewing the corridor regulatory framework respecting 5 principles (1) 25-30 year- concession period, 2) non-discriminatory tariffs, 3) monitoring and auditing commission of multi-disciplinary experts to audit concession returns and applied tariffs, 4) coding regime into PPP legislation 5) strong independent regulatory body precluding political interference)</p> <p>Leveraging the partnership of the Sena Line put forth by the multi user model to ensure the completion of CESUL, Phase 2</p>	MTC, SDI Unit, CFM	AMDCM, Coal Mining Companies IPPs, ESKOM	AfDB DFID, European Investment Bank, WB
Completing two key trunk infrastructure of the Nacala Corridor by cross-border integration	<p>Devising operational and binding cross-border arrangement (1) integrated border and corridor management under a steering committee of SADC or COMESA, 2) consultation with stakeholders under a Corridor Logistic Initiative such as MCLI, 3) establishment of the binding nature of the cross-border agreements into the national law, 4) cross-border logistic solutions to enable shared platform with the rest of economy)</p> <p>Leveraging the cross-border approach of the Nacala Line to revive the Interconnector (joint financing for each phase, SAPP project coordinator, pooled resources in designing a well-package project)</p>	MTC, SDI Unit CFM, CEAR Ministry of Energy, EDM, Local governors, ESCOM, SADC, SAPP	Vale, CDN and other Minority Stakeholders, IFC MIGA	African Union, DFID,WB, AfDB, JICA, Norway Embassy, Chinese EXIM Bank
Public-private partnership for the diversification of the economy	<p>Strong industrial policy to lift inhibitors of value addition (1) targeting human resource constraints, 2) enabling the business environment, 3) shifting toward a value chain approach)</p> <p>Collaborative approach to set up a National Linkage Center (1) to identify the right value chains, 2) to monitor value-addition of linkage program, 3) to advise on suitable corporate policies, 4) to suggest public-private sponsored initiatives)</p> <p>Collaborative approach to set up a competitiveness commission (1) to assess potential for downstream, and 2) its related fiscal and investment policy)</p>	Min. of Education, Min. of Labor, Min. of Science and Technology, COREP, Min. of Commerce and Industry, SDI	IGM, Instituto Superior Politecnico, LEM, Don Bosco, UEM, Local Banks, IPEM, IPEX, ACIS, CTA, Megaprojects	Italian Cooperation, Canadian Cooperation, WB, UNDP Danida, GIZ, IFC

Chapter Three: Managing the Environment and Climate Risks for Development in the Zambezi Valley

Introduction

The mining boom in Tete presents enormous opportunities for poverty reduction and the economic development of the country, as the other four chapters of the report detail. Importantly, sustainable development also necessitates the protection of other natural resources of great value to the society and the development of the country. Thus, this chapter is dedicated to environmental protection, damage mitigation, and management of risks and opportunities from climate variability and change.

Careful prevention, assessment, and mitigation of the environmental impacts of development are in the mutual interest of all public and private stakeholders in the region and require a partnership and coordinated actions. The environmental impacts caused by mining, transportation, agriculture, and other economic activities are diverse and, without careful environmental management, may be irreversible.

An environmental management system that allows for the exploitation of natural resources while minimizing negative environmental effects provides the best guarantee of sustainable growth. Such a system would consider a phased cumulative environmental impact assessment encompassing all megaprojects and infrastructure projects in the region.

In addition to strengthening the framework for environmental protection and sustainability, Mozambique and the Zambezi Valley could significantly benefit from improved management of climate-related risks and opportunities. The risks for the region include disasters such as droughts, floods, and cyclones, as well as the impacts of climate variability (e.g., a drier than normal rainy season followed by much wetter seasons). Integrating climate information and a risk-based approach into decision-making and planning across sectors and temporal scales could make development gains more climate-resilient.

1. Assessing cumulative environmental impacts in the Zambezi Valley

Mining poses a variety of direct and indirect risks to the environment. These risks can be minimized and mitigated by strict compliance with environmental legislation, regulation, and best practices. Yet even with strict adherence to the highest standards by all companies, damage could be done if the *cumulative impacts* of related or unrelated projects are not considered and likewise mitigated as the mining industry grows in Mozambique. A cumulative environmental impact approach recognizes that no environmental impact occurs in a vacuum; rather, it is part of a wider network of causal relationships.

Cumulative impact assessment requires broadening the scope of inquiry to take into account wider geographical and temporal considerations, interactions among impact sources and causal pathways. For example, while any one mine site can monitor dust, smoke, and other sources of air pollution emitted during its operation and ensure that these are kept below legal limits, if several mines operating in a given region emit this same amount, local communities may be exposed to emissions far surpassing legal limits. Likewise, the size of water concessions granted to mining operations drawing water from a

specific water source must take into account all of the entities that use that source, as well as the projected future water use of those entities.

Managing site-specific impacts and cumulative impacts involve different levels of stakeholder involvement. For example, managing for water quality on-site may involve setting discharge limits, meeting license conditions, and completing site-specific mitigation efforts. On the other hand, managing for water quality on a cumulative scale may involve jointly funded research into waterway and catchment capacities, engaging local mines and regulators in a process to establish standards for regulating water discharges, and establishing a regional collaborative mechanism to oversee and monitor the adaptation of these standards.

Using this collective approach, the first priority of stakeholders in the region could be the completion of a **cumulative environmental impact assessment report encompassing all of the extractive megaprojects in Tete Province**. Since coal mining is the largest sector, this could possibly be a project led by the Mozambican Association for Mineral Coal Development (AMDCM) with the strong support of Vale, Rio Tinto/ Riversdale, a consortium of environmental NGOs, and the Ministry of Coordination of Environmental Affairs (MICOA). This initiative would be a pilot for cumulative environmental impact management in the region and could possibly have positive spillover effects on the other mines of the region and country (in gold, copper, and iron-ore). In the medium term, all the impact assessments of the mining sector could be consolidated to prepare for the production phase that the Vale and Rio Tinto/Riversdale mines will soon be entering. Such undertakings could be inspired by the industry group's initiative in Alberta, Canada.

Alberta, Canada: Industry support to government planning and impact preparedness

In Alberta, Canada, the industry organization, the Oil Sands Developers Group, in addition to its traditional collective representation role, "commissions industry forecasting surveys to assist the government/industry planning of social and physical infrastructure development and to anticipate and respond to social, economic, and environmental impacts." It began by working at the regional scale by forming committees to respond to priority issues (for example, regional environmental, and regulatory affairs). The Group emerged out of a relatively informal group of companies who all had a vested interest in aggregating data. **Now it is a requirement of membership to provide data during surveying. Data is publicly reported in an anonymous and aggregated form.**²⁰⁶

Impacts can accumulate not just at the mine site, but with the ancillary infrastructure that will be needed to support these industries, such as rail, roads, and power transmission. The second step of a cumulative impact approach could then focus on the cumulative impacts of the other uses of land and water, including not just infrastructure but also agriculture, aquaculture, and other uses. Such an assessment would strengthen the planning of the multi-modal capacity of regional development corridors and help balance the needs in terms of land and water use for each sector and geographic area.

The study should both monitor *actual* impacts as well as identify *likely* impacts. The results of the study would be most useful if they are made publicly available and allow for citizen monitoring. Many interviewed for this report thought that more environmental auditing would be a positive development—including companies who want their efforts known and recognized. Citizen monitoring groups can expand the reach of the government monitoring efforts, which are still growing.

²⁰⁶ D. Franks, D. Brereton, C. Moran, T. Sarker, T. Cohen, 2010, Cumulative Impacts, A good practice guide for the Australian Coal Industry, University of Queensland, SMI

Sections 1 and 2 in this chapter identify major environmental concerns in the local (Tete) and regional (Zambezi Valley) environment, using the cumulative impact approach. They assess the direct impacts of mining operations, the impacts from the construction of transportation and utility infrastructure, and identify the broader concerns affecting the entire Lower Zambezi Region. Section 3 of the chapter discusses the challenges to development posed by climate variability and climate change in the region and the steps that can be taken to address these risks and take advantage of climate-related opportunities.

1.1 Cumulative direct impacts of mining operations in Tete

Environmental concerns are implicated at every stage of the mining process from site selection to reclamation. It is difficult to obtain a complete view of the environmental concerns emerging from mining practices in isolation from other issues, such as societal health and development.²⁰⁷ However, among the many concerns, certain major issues can be identified.

1.1.1 Water pollution and water resource management

“Understanding the risk posed by contaminants in water in our environment involves viewing the environment as a whole: the physical, chemical, biological, social, cultural, and economic conditions with which human beings interact... A ‘safe’ level in one of these exposures may combine to produce toxic effects if multiple exposures are involved. The risk is much greater if health is already compromised by malnutrition, poverty and poor sanitation.”²⁰⁸ -World Health Organization, 2001

Water resource management emerged as one of the greatest concerns of stakeholders in Tete. Because it is a scarce resource, access to fresh water can be a constraint on development.²⁰⁹ Strategic water management is essential to environmental and economic sustainability in Tete Province. Poor water management can threaten industry reputation and therefore future access to land and water.

Minimizing the water needed for operations

Vale’s Moatize mine offers a good example of a comprehensive water plan that seeks to minimize the amount of water needed for operation. The mine site obtains water from aquifers located on the Rio Tinto/Riversdale concession, which in turn draws water from the Revuboe tributary. Hydrological studies commissioned by Vale show that the mine will have no impact on the Revuboe. In the first year, the mine will take a significant amount of water; however once the water system’s pipes are full, approximately 90% of all water will be recycled. The only additional water that will then be needed will be a small amount to compensate for evaporation. This is beneficial for the local ecosystems, because it minimizes the amount of water used for the mine, and optimal for Vale, because the company will pay fewer water rents. Such practices are valuable and can be replicated in the region when geologically possible.

Minimizing the water effluent from the mine

²⁰⁷ Mpumalanga Province, South Africa, EO-Miners, http://www.eo-miners.eu/test_sites/ts_testsite2_witbank.htm

²⁰⁸ World Water Day 2001: Pollution from industry, mining and agriculture, World Health Organization, http://www.who.int/water_sanitation_health/industry/pollution/en/

²⁰⁹ Gallego-Ayala, 24

Mining operations generate a range of waste products, such as sulfuric acid and radioactive heavy metals, which may leach into local water sources. Unless carefully contained, the leached water can move into waterways, acidifying the water and killing fish, plants, and other aquatic life that is sensitive to shifts in water pH, and rendering water sources unsuitable for agriculture and consumption.²¹⁰ This is of particular concern to inhabitants surrounding the Moatize mine, since most residents of the area depend on these aquifers for their daily water use and consumption. The risk of leaching is exacerbated by flooding, and Tete is especially prone to flooding because of its low-lying topography. A climate risk management approach (see Section 3 below) could help address some of the concerns associated with flooding, which may increase due to climate change.

According to Vale's environmental experts, overflow water effluent from the Moatize mine will be minimal, probably only occurring in the event of a flood, and this effluent will be directed towards a high-volume segment of the Revuboe where any contaminants that happen to remain in the treated water will be diluted. This is similar in theory to the method developed by the Water Research Institute at West Virginia University and implemented in Monongahela River, whereby wastewater was pumped out only when the river flow was high, from December through June, in an attempt to keep the level of total dissolved solids in the water low.²¹¹ [Given predictions for shifting rainfall patterns and changing flood frequency and intensity due to climate change, there is a need for further study and assessment of possible risks.](#)

Water resource management strategies should be part of cumulative impact management

Water resource management strategies should be integrated into the cumulative impact assessment and management strategies, such as done in Queensland Australia (see box). Optimal strategies for environmental conservation require interaction among individual initiatives, collective quantification, and coordination.

Cumulative impact assessment in Queensland, Australia

In Queensland, Australia BHP Billiton Mitsubishi Alliance and Anglo American collaborated to conduct a voluntary impact assessment on the cumulative impacts of coal mining on a 100km stretch of the Isaac River. The Queensland Department of Environment and Resource Management was also a major stakeholder. The assessment sought to identify the impacts of mining on the river and provide recommendations for mine planning and operations that would ensure the best future outcomes for the health of the river system. **Part of the reasoning behind the assessment was that to understand such a large and complex river system, an assessment was needed that "exceeds the scale of individual mine leases." This assessment goes beyond the companies' legal requirements.**²¹²

There is a need for companies to monitor the pollution of the waters collectively and continuously, as well as to establish a coordinated emergency response plan in the event that aquifers become contaminated. Since companies such as Vale have developed emergency plans for the construction phase and operation phase of the mine, these plans would be substantially more useful and effective if the standards triggering an emergency response were established collectively in the mining region.

²¹⁰Surface Mining of non-Coal Minerals: *a Study of Mineral Mining From the Perspective of the Surface Mining Control and Reclamation Act of 1977: A Report*, National Research Council (U.S.) on Surface Mining and Reclamation, (1979) (hereinafter the '1979 Report')

²¹¹Project controls coal mine water pollution, WVU says, Associated Press, February 18, 2011, available at: <http://www.wvgazette.com/News/201102181334>.

²¹² D. Franks, D. Brereton, C. Moran, T. Sarker, T. Cohen, 2010, Cumulative Impacts, A good practice guide for the Australian Coal Industry, University of Queensland, SMI

Such a coordinated plan could be done under the auspices of the World Meteorological Organization (WMO) and the UN Industrial Development Organization (UNIDO), which are working on a project to rehabilitate and improve the network for monitoring water quality within the Zambezi basin, with data used to develop measures to control pollution.²¹³

1.1.2 Air pollution and greenhouse gas emissions

Dust

Large quantities of dust are raised through the open-pit mining process, which primarily utilizes heavy machinery. Dust, often containing coal and silica, can carry into surrounding areas and can lead to asthma problems, severe headaches, mouth blisters, constant runny noses, nausea, and even kidney and cardiac diseases.²¹⁴ The level of dust generated by a coal mine is substantial but can be mitigated. For instance, Vale will be using water from the Moatize mine's return water pond for dust suppression.

A fact-finding survey conducted at a large Bharat Coking Coal Limited (BCCL) project in India revealed that the mine was generating 936 tons of dust per day.²¹⁵ Watering disturbed areas or using chemical stabilizers can help control the spread of fugitive dust. Moreover, the mine created a detailed strategy of using trees to control pollution, especially dust.²¹⁶

Acquiring land surrounding the mining area to act as a buffer zone can have multiple benefits. Trees can be planted in this area. This will reduce the effects of pollution and dust and will help mitigate the visual impact of the mine.

Hazardous gases

The mining process often releases pockets of hazardous gases that may be a source of air pollution. In particular, carbon dioxide (CO₂) and methane are hazardous gases that are also greenhouse gases that contribute to climate change. Coal generates more carbon emissions than gas as a power-sector feedstock.²¹⁷ Coal mining also produces methane, which can explode even after mining production ends if not properly drained from the mine. In addition to this hazard, methane can be over 20 times more potent than carbon dioxide (CO₂) in trapping heat in the atmosphere as a greenhouse gas (EPA, 2010²¹⁸). By contributing to climate change, these greenhouse gases are not only hazardous in the short-term but also play a role in very significant climate-related consequences over the coming decades (see Section 3 of this chapter). One promising solution is to capture methane and use it as an energy source.

²¹³ <http://www.un.org/ecosocdev/geninfo/afrec/vol11no2/special3.htm>

²¹⁴ For a number of studies that show the adverse effects of mining on human health, see Science news, Sciencedaily.com, available at <http://www.sciencedaily.com/releases/2008/03/080326201751.htm>, (last visited Feb. 12, 2011); also see Alan Lockwood, Kristen Welker-Hood, Molly Rauch, Barbara Gottlieb, "Coal's Assault on Human Health" Physicians for Social Responsibility Report, November 2009

²¹⁵ M. K. Ghose and S. R. Majee, *Air Pollution Caused by Opencast Mining and Its Abatement Measures in India*, *Journal of Environmental Management* (2001) 63, 193–202

²¹⁶ The authors of the study suggested: "(1) Trees should be planted in beds arranged perpendicular to the direction of prevailing wind; (2) Trees should be planted in a concentric fashion around the source of pollution; (3) Peripheral plantations may also be used as wind-breaks on dry tailings; (4) A judicious mixture of open and permeable planting with dense planting should be made to achieve maximum beneficial effect; (5) Plants and trees of different heights should be planted on both sides of the traffic lanes; (6) A wide green belt of 10-m width with six rows of tall fast-growing trees should be raised around the mine complex."²¹⁶

²¹⁷ Mozambique on the way to challenge S Africa, July 2010, http://findarticles.com/p/articles/mi_qa5327/is_366/ai_n54637658/

²¹⁸ 2010 Greenhouse Gas Inventory Report, EPA (US Environmental Protection Agency), 2010, available at <http://epa.gov/climatechange/emissions/usinventoryreport.html>, (last visited October 2010)

The Moura mine in Central Queensland, Australia has a commercial coal mine methane business alongside its mining operations. This business has the potential to make GHG emission savings equivalent to 2.8 million tons of CO₂ per year.

The feasibility of this type of project at an open-pit mine such as Moatize is unclear. A feasibility study could determine if collective or individual mines could collect methane on a commercial scale.

Calculating and managing cumulative impacts are particularly important with air pollution: if more than one mine is operating in a given area, the compounded effects of emissions and dust must be taken into consideration. This is especially true in Tete Province, where the abundance of coal and multiple projects in the region guarantee multiple sources of emissions.

1.1.3 Soil degradation

One of the major direct environmental and societal impacts of mining is land degradation. Since the operations leading to open-pit mining occur directly at the surface, the blasting from explosives and subsequent earth movement can render the surrounding areas uninhabitable and unfit for productive use. Removal of overburden for the purposes of mining results in the loss of topsoil, creating infertile land. Once the overburden is removed, the land will not be able to support most wildlife and very few plants. Without reclamation it takes many years, and likely decades, for the land to return to its original state. Vale utilizes a strip-mining technique, under which rehabilitation for mined land begins as soon as mining operations move on to the next strip of land.

Cumulative effects of changes deep into the earth's surface may not be known without cumulative impact assessments. The water table, for example, may be affected by large numbers of new displacements of the earth, among other effects. Given how critical water is generally but particularly for arid regions, close attention to soil degradation and the macro-effects of multiple mining projects on other activities, like agriculture, could be key to ensuring mining does not undermine other industries and the well-being of Tete citizens.

1.1.4 Effect on biodiversity

Mining operations can have substantial impacts on wildlife habitats, affecting the biodiversity in the region and the stability of local species. Particularly in the case of open-pit mining, full biodiversity restoration may not even be possible.²¹⁹ Migration of flora and fauna may change as well as mines develop.

Moatize mining project, inclusive of the planned use of the Beira and Nacala corridors for transportation, intersects with two of World Wildlife Fund's (WWF) priority areas for conservation,²²⁰ the Miombo Woodlands and Coastal East Africa. These also contain two of Conservation International's biodiversity hotspots,²²¹ the Eastern Afromontane and Coastal Forests of Eastern Africa. The WWF is especially interested in gathering support for creating and managing protected areas throughout the country and

²¹⁹ http://www.fba.org.au/publication/downloads/RT-Coal-mining--biodiversity-080303-_FinalDraft.pdf

²²⁰ http://wwf.panda.org/what_we_do/where_we_work/

²²¹ http://www.conservation.org/explore/priority_areas/hotspots/Pages/hotspots_main.aspx. Hotspots are defined by areas with high level of endemism and threat.

therefore would be an excellent partner in developing a plan for minimizing the mine's impact on biodiversity as well as ensuring long-term preservation and restoration. The WWF has already established the Lake Niassa Reserve and is seeking to create a protected area to be made available for tourism investment.²²² The WWF's Miombo Ecoregion Conservation Program Works to combat poverty and preserve threatened species by creating the basis for a sustainable management of natural resources in the area.²²³

Tracking the impacts of the mining operations on wildlife habitats can provide an ongoing picture of mining effects on biodiversity, both in official conservation areas and the general biodiversity of the Zambezi Valley region. Cooperation and collaboration among partners in the region is practically imperative for generating this complete picture of the effects on biodiversity and for developing a plan to mitigate impacts, given the roaming and sprawling abilities of both flora and fauna. Lessons for reducing biodiversity impacts of coal mining can also be learned from other coal mining projects.

The Bowen Basin open-pit mines in Queensland, Australia, have been in operation in some capacity for over a century, and past reports on preserving regional biodiversity have been produced.²²⁴ Reports suggest the use of ecosystem offsets—actions which provide compensatory mitigation for irreparable damage to diversity—as a way of maintaining the net biodiversity of the region, or nation.

The Bowen Basin approach is also supported by the WWF. Such offset frameworks should be explored as a second option after direct mitigation of damages through efforts such as restoration or rehabilitation of the land. Rio Tinto is one of several mining company members of the Biodiversity and Business Offset Program (BBOP) Advisory Group, a partnership between companies, governments, and conservation experts to explore biodiversity offsets, and would presumably partner in promoting biodiversity conservation in the Zambezi Valley.

1. 2. Expanding cumulative mining impact assessment to other land and water uses

1.2.1 Informing policy making related to land and water use

Beyond assessing the cumulative impacts of mines, depicting an integrated picture of all the activities affecting the environment will complement the integrated planning that the SDI unit is putting in place (see Chapter 2 for more on the SDI unit). Understanding the cumulative impact of all the major activities should usefully inform policy options and mitigation strategies.

Cumulative impact study of the Upper Hunter Valley region in Australia

During the 1990's, the New South Wales government in Australia conducted a cumulative impact study of the Upper Hunter Valley region, focusing on coal mining and taking into account "strategic land use and development planning at both the local and regional levels." **All possible relationships between land uses and development were examined, and data was collected regarding air quality, water quality, etc.** Following this, a strategic assessment took place to determine the coal mining potential of the region, taking into account "coal resources, mine development potential, surface and groundwater, social and amenity issues, natural and cultural heritage, land and agriculture."²²⁵

²²² http://wwf.panda.org/who_we_are/wwf_offices/mozambique/wwf_mozambique__our_solutions/

²²³ http://wwf.panda.org/about_our_earth/ecoregions/central_eastern_miombo_woodlands.cfm

²²⁴ http://www.fba.org.au/publication/downloads/RT-Coal-mining--biodiversity-080303-_FinalDraft.pdf

²²⁵ D. Franks, D. Brereton, C. Moran, T. Sarker, T. Cohen, 2010, Cumulative Impacts, A good practice guide for the Australian Coal Industry, University of Queensland, SMI

Such a cumulative assessment would build on the findings of the United Nations Poverty-Environment Initiative's study identifying a number of recommendations on how agriculture, energy, health, mining, public works, tourism, and fisheries sectors can improve environmental mainstreaming.²²⁶ In that sense, the cumulative assessment strategy will look at the competitive uses of land and water and their combined environmental impact and inform policies seeking environmental net benefits.

One of the most important sectors to add in terms of assessing cumulative impacts is that of infrastructure. All forms of infrastructure (e.g., transportation, including roads, rail, and ports; water and sanitation; the electrical grid and telecommunications) have environmental impacts, and understanding the cumulative impacts of resource extraction with the various means of anticipated transportation provides a more complete environmental assessment of impacts and can guide policy in terms of prioritization and design of infrastructure along the corridors.

In the Zambezi Valley, there has been intensification of road development and of rail and port construction and rehabilitation, and serious consideration of expanding river transportation.²²⁷ Each of the above has serious environmental implications: travel by road produces greenhouse-gas emissions, which contribute to climate change; rail development would cause fewer emissions, though the specific type and quantity would depend on the technology used; the Shire-Zambezi plan would require dredging and channelization, which can have substantial impacts on riverbanks, fisheries, downstream soil fertility, downstream flooding, changes in water temperature, and even the likelihood of downstream disease vectors, including parasites and water-borne diseases (such as malaria, urinary schistosomiasis, diarrhoea, intestinal parasitic diseases, and intestinal schistosomiasis).

On the other hand, improvements in transportation systems can significantly improve mobility and resilience in the case of severe weather events. Once trade-offs between the benefits of infrastructure and the impacts on the environment are recognized, efforts to mitigate specific harms could be undertaken. Where environmental harms are irreversible or cannot be mitigated, conservation projects could be undertaken to offset the environmental harms. For example, where an ecosystem is negatively impacted by road construction, a conservation area nearby or in a similar ecosystem should be established.

Likewise, dam construction, such as the Mphanda Nkuwa Dam, can damage terrestrial and aquatic ecosystems through upstream inundation as well as by altering the freshwater aquatic ecosystems. However, dams can also serve as multi-purpose reservoirs for seasonal water supply, which can be critical in a region like the Zambezi Valley; the current storage is 5% of the annual runoff (excluding the Cahora Bassa Dam, which is a single-purpose hydropower dam), whereas minimum suggested storage is 40%.²²⁸ Dams should therefore be constructed as multipurpose dams, including considerations of hydraulic structures and local scale hydropower units, irrigation, flood prevention and water resources protection, and pollution prevention. In contrast, single-purpose dams have limited capacity to serve other economic and social needs, and their investments often have higher opportunity costs. For instance, during the floods of 2000, the Cahora Bassa Dam, which was constructed only for hydropower, could have played an important flood mitigation role, but its operational rules do not permit use of

²²⁶ http://www.unpei.org/programmes/country_profiles/mozambique.asp

²²⁷ The Shire-Zambezi riverway plan would attempt to create navigable access through the Shire River, which serves as outlet for Lake Malawi and flows into the Zambezi River.

²²⁸ The Role of Water in the Mozambique Economique- Identifying Vulnerability and Constraints to Growth- Memorandum, April 2005- World Bank

storage capacity to mitigate water shocks.²²⁹

Finally, even power and information and communication technology (ICT) transmission line installation can have environmental impacts such as increasing erosion, interfering with local drainage patterns, threats to fauna of electric shock, etc. However, once again, ICT and power are obviously critical to development and, in particular, can be instrumental to managing risks from climate variability and extremes. Therefore, where installation is deemed essential, mitigation efforts and other methods of offsetting environmental harm should be undertaken.

Overall, policy related to infrastructure development—including the use of specific technologies, spatial design of infrastructure, and determining tradeoffs of various forms of infrastructure—would benefit tremendously from a cumulative impact assessment and the development of effective policy tools to both mitigate negative impacts and improve resilience and adaptability to environmental shocks.

1.2.2 Supporting cumulative impact assessment with use of Geographic Information System

The cumulative impact assessment would be facilitated by use of Geographic Information System (GIS), which enables production, management, dissemination and use of spatial data at regional and national levels. GIS, although still not used extensively in Africa, can be useful to analyze impacts of economic activities on land and water use, land degradation, and livelihoods of local communities. GIS can serve as a multi-layered and dynamic natural resources information system²³⁰ that provides basic land and water management and planning information, thereby enabling decision-makers to manage industrial development and “land cover change.” The Kenyan Neo geospatial research station offers an example of the technology involved and its related usefulness (see box).

Neo-geospatial research station of Taita Hills, Kenya²³¹

The research station in the Taita Taveta county of Kenya, established as a joint venture between the University of Nairobi and the University of Helsinki is studying land-cover and land-use change, fragmentation of indigenous cloud forests, land degradation, land-use conflicts, and livelihoods of local communities in the Taita Hills and surrounding plains. The main research data and methods have been remote sensing with airborne and satellite imagery, and the use of geographic information systems for mapping, modeling, and analyzing the landscape changes. The geospatial data is stored in geographic databases for further use and collaboration. The Taita Taveta area is especially well-suited for research on the interaction between land-cover changes and regional climate change issues.

1.2.3 Cumulative impacts needs also to be conducted at cross-border level

*“A key lifeline for eight states, the Zambezi must be managed effectively to mitigate the effects on water supply of increased population, industrial and mining development, and greater irrigated food production.”*²³²

²²⁹ WB-Africa’s infrastructure—a time for transformation, 2010

²³⁰ See the multi-layer natural resource and land use database and map for Darfur Sudan, GSDI Africa Newsletter, April 2001, www.gsdi.org/

²³¹ Adapted from www.gsdi.org/.

²³² <http://www.un.org/ecosocdev/geninfo/afrec/vol11no2/special3.htm>

Activity at upstream dams in Angola, Zambia, and Zimbabwe has effects in Mozambique, as it is the last country to receive waters from the many major and minor rivers that discharge into the Indian Ocean. These countries often do not warn Mozambique when they will be opening their dams, and therefore Tete Province sometimes suffers from an unexpected deluge of water. This can be exacerbated by variability in weather patterns in the region. Communication with neighboring countries must be improved to prevent and control flooding and improve cross-border water management. Similarly, if mining companies located in Tete, Mozambique, decide to construct a trans-border hydroway (the Shire-Zambezi waterway), the risks posed by the design, construction, and operation of the project will be borne by both Mozambique and Malawi.

With the cumulative perspective, an integrated water resource management plan (IWRM) should be developed to help limit the damage suffered from upstream water use. The government of Mozambique has committed to developing an IWRM and has begun updating the political and legal frameworks.²³³ It would be useful for the IWRM to articulate specific policies for drought mitigation, flood management, irrigation development, and rural water supplies, similar to that done in the Fergana Valley. These policies in the context of an IWRM plan could help in the management of risks and opportunities due to existing climate variability and climate change. Benefits accrue not only to the agricultural sector, but also hydropower, urban centers and industries.

Integrated water resource management in the Fergana Valley

The Interstate Commission for Water Coordination, with assistance from the Swiss Agency for Development and Cooperation, led the implementation of an IWRM plan in the Fergana Valley where Uzbekistan, Kirgizstan, and Tajikistan share territorial boundaries and water is scarce. The program provides 80,000 people with safe drinking water, decreasing the occurrence of waterborne diseases and virtually eradicating infant mortality. It resulted in an “expansion of improved irrigation practices as well as innovative solutions for irrigation canal management and sustainable water-user associations, in addition to sustainable financing at canal, water-user association, and farm level.”²³⁴

A fully developed IWRM could benefit from UN agencies involved in the water sector that are currently working to compile information on all current and planned projects in the Zambezi basin area for inclusion in a UN Environment Program (UNEP) data base.²³⁵

There is currently an IWRM training program for Zambezi Basin countries taking place in South Africa and hosted by Romboll Natura, an international consulting company focused on sustainable development of natural resources.²³⁶ This could be an important resource for all of the regional governments, including Mozambique. Other possible regional partners are International Rivers, Wetlands International, WaterNet, a southern-Africa based network of researchers dedicated to capacity building for water resource management in the region; and the African Centre for Water Research (ACWR), a legal, policy, and capacity building consultancy focused on water resource management in Africa.²³⁷

²³³ Gallego-Ayala, 24

²³⁴ UN Water, *supra* note 1 at 26 (citing SDC in Central Asia – IWRM, available at www.swisscoop.uz/en/Home/Regional_Activities/Integrated_Water_Resources_Management).

²³⁵ <http://www.un.org/ecosocdev/geninfo/afrec/vol11no2/special3.htm>

²³⁶ <http://www.rambollnatura.se/services/capacity%20development%20and%20training/iwrm%20zambezi>.

²³⁷ <http://www.waternetonline.ihe.nl/>, <http://www.acwr.co.za/index.php>

Trans-border initiatives require strategic assessment of land-use potential and environmental constraints under all nations' environmental protection laws and policies. Infrastructure, industrial development, and management of water resources can significantly affect environmental and economic stability all along the Zambezi Valley; thus increased cross-border communication would be beneficial for all governments and populations.

2. Strengthening the environmental governance

Mozambique's environmental law framework is clear, comprehensive, and widely respected among stakeholders. It meets international best practice standards and, in some respects, even surpasses them. Many Mozambican laws were made with reference to International Financial Corporation (IFC) and Brazilian standards. The enthusiasm and willingness of the Government to improve the enforcement of environmental standards is commendable. The Ministry of Cooperation and Environmental Affairs (MICOA) is clearly committed to environmental protection.

However, implementation and stringent and transparent enforcement of the environmental law framework is often hindered by a lack of human, financial, and institutional resources. All stakeholders recognize that increasing the enforceability and transparency of Mozambican environmental law and regulatory practices is a key step towards protecting the nation's resources in both the long and short term.

2.1 Investing in technical assistance for managing licenses, audits, and reports

As industry and development increases in Mozambique, the number, size, and scope of projects requiring environmental licenses and environmental impact assessments (EIAs) will increase exponentially. The need for increased technical assistance at the provincial level is especially urgent. MICOA requires a greater number of employees with the technical knowledge to properly assess environmental license applications, EIAs, environmental audits, and monitoring reports. Increasing the number of employees in MICOA, the National Directorate of Environmental Assessment, and in Provincial Directorate offices will help in this regard, but those employees must have the necessary technical knowledge to be effective. Technical assistance could be transformative for the government entities charged with enforcing environmental law.

The pooling of resources among stakeholders will be key to overcoming this challenge. Collaboration between the government, private-sector partners, environmental NGOs, and the academic community will facilitate the increase of local technical and institutional expertise and guide the implementation of new policies aimed at the extractive industry. For instance:

- Vale and Rio Tinto/Riversdale are large corporations with significant experience in environmental regulations and management in many jurisdictions.
- Environmental NGOs in Mozambique, such as the World Wildlife Fund and Justiça Ambiental, fill important gaps in the environmental management system and are connected to a wide network of environmental experts, who may be useful either as contracted EIA specialists or training advisors.
- The resources and expertise of the academic community of national universities (such as the University of Eduardo Mondlane) or of international universities (such as the Earth Institute at Columbia University) could also be mobilized to provide training and policy advice to government officials.

- The UNDP through its UNPEI initiative has also been highly involved in technical assistance in the region and could be an excellent resource for a large-scale training program.

Both industry and civil society have been willing to use their resources to advise the government on the drafting of new laws; indeed, their comments on the draft “Megaprojects Law” were very useful in its development.

In order to avoid charges of undue influence, however, stakeholders should understand that the partnerships forged between government and industry in the development of capacity must be carefully and transparently designed to ensure objectivity.

2.2 Updating legislative and regulatory systems

2.2.1 Environment standards

While there is a relatively comprehensive environmental management system in place in Mozambique, rapidly developing industry, the progress of scientific knowledge, and changing climate and environmental conditions mean that these systems are stronger in theory than in practice. The environmental standards of Mozambique are broadly formulated, are often not adapted to industrial processes and are suitable to multiple interpretations. The last ten years of implementation and observations of the applications of the law have revealed the weaknesses and loopholes in the law.

All stakeholders will benefit from the continued effort to update and modernize the legislation and standards on an ongoing basis. In the meantime, as updating legislation can take time, in the event that a regulation does not provide specific standards governing industrial processes, operators should use the same high standards and best practices they adopt in other countries of operation. There is some evidence that this is happening at the megaprojects in Tete Province. For example, while Mozambican regulations monitor about 5 indicators in water quality, Vale monitors over 80 indicators, in keeping with its international practices. In addition, although environmental auditing by the Mozambican government is rare, Vale carries out its own internal and external audits on a regular basis.

MICOA could resort to these advanced audits to develop stringent national qualitative and quantitative pollution and emission standards that are increasingly critical with the growth in industrial development.

2.2.2 Water concessions

One area that stands out as a particular area in need of updating is the current system for water concessions. The Government may want to consider limiting its concession to short-term concessions by law. While long water concessions may allow a specific concessionaire to plan water resource management for the lifespan of a mine, it impedes the government from changing water resource allocations as other entities begin using the same resource or the water needs of local communities increase. If megaprojects continue developing in Tete at the current rate, a water concession that seems reasonable today may not be environmentally sustainable in the near future. In fact, the water availability per capita is expected to decrease by 20% by 2015 according to the USAID,²³⁸ and serious

²³⁸ The water availability is expected to decrease by 20%,²³⁸ from average 10.500 m³/person/year in 1960-2007 to 8,500 m³/person/year in 2015²³⁸ as the population increases and migrates to urban areas, Source: USAID Country Assistance Strategy, 2009-2014

water shortages already occur in Tete during the dry season in a number of sub-basins. An optimal revision to the regulations may be informed by a regular impact assessment of the accumulation of water concessions and its implications on sustainability, particularly considering land use changes, demographic trends and changing climate and hydrological conditions.

2.2.3 Assurance bonds

The assurance bonds (or “reclamation bonds”) that a corporation is required to post before construction begins on a project should be sufficient to fully cover the costs of reclamation once the mining activity has ceased. While low estimates of this cost might not have significant consequences for one mine, it becomes more problematic for a cluster of mine, such as the cluster developing in Tete. Here again, the cumulative assessment would be useful as a planning tool. Such assurance bonds could be assessed after the development of regional mine closure strategies such as those developed in South Africa.

Since 2008, South Africa has developed Regional Mine Closure Strategies that are meant to address the impact that the closing of a mine had on local communities, industries, and infrastructure. The strategies are led by the Department of Minerals and Energy, the Council for Scientific and Industrial Research, Mintek, and the Council for Geoscience.

2.2.4 Enforcement of the regulatory system

Increased human and material resources in MICOA will also ensure the Ministry has the capacity to oversee the auditing process. For now, with its limited resources, MICOA limits its environmental audits to situations where an environmental harm is obviously imminent or already occurring, and even the frequency of these audits is not sufficient.

The enforcement of the environmental regulatory regime would be strengthened if:

- 1) Mandatory environmental audits would be conducted prior to the renewal of environmental licenses, which would allow the government to keep track of the environmental impacts caused by mining operations.
- 2) All extractive activities in the region would be assessed continuously to ensure the management of risks and potential hazards that might affect the environment.
- 3) MICOA, through the National Directorate, would increase the scale of penalties, which are currently quite low, to deter violations of EIA procedure.
- 4) Transparency was more enshrined in the system:
 - a. To ensure the objectivity of the environmental assessment and environmental licensing processes, clear standards for the granting or denial of licenses should be formulated and made available to the public. Such a measure would avoid the potential for criticism that the government is too lenient toward the industry’s interests.
 - b. The separation of the environmental regulatory and licensing agencies would be an important step in guaranteeing the objectivity of licensing procedures since getting a license is a pre-condition to getting the next license.
 - c. Expanding the EITI initiative to incorporate transparency in environmental information and company reports.
- 5) More systematic public participation in the environmental licensing and auditing process through public hearings, comment periods, and other such forums. Currently, the public’s

participation in the EIA process, mandated by law, can be satisfied by presenting the EIA to the public with little or no interaction or follow-up.

Donors such as the African Development Bank and Millennium Challenge Corporation (MCC) can supplement these efforts by ensuring that the projects they fund include the environmental terms of reference, provide minimum impact on the climate, participate in cumulative impact assessments, and undertake full public participation. The US Government has funded citizen monitoring efforts to increase its oversight of its nuclear sites. While coal mining is certainly not nuclear, a similar process can be employed for environmental monitoring by citizens.²³⁹

For instance, MCC requires public participation in the design of their projects both during the scoping phase, when it shares the timeline of the project, discusses potential implications, and asks for opinions, as well as after an Environmental Management Plan has been completed, when key impacts and mitigations measures are discussed. “Focus group” discussions with women and/or specific cultural groups can help guarantee that underrepresented voices are heard. This model is a positive example of the ways in which the public can be involved in decision-making.

2.3 Adopting the cumulative impact approach at the ministry level

Adopting a cumulative impact approach requires substantial coordination between public and private stakeholders as well as within the government ministries and agencies. Alberta, Canada, provides a useful example of the political and organizational difficulty that can be encountered in implementing such a strategy.

Challenges of a multi-stakeholder association to assess the cumulative impacts

In Alberta, the Cumulative Environmental Management Association (CEMA), governed by government, industry, environmental NGOs and indigenous groups, assists the government to manage environmental impacts of oil sands development. CEMA developed a conceptual framework for cumulative impact assessment as well as timelines for implementation. CEMA is mostly funded by industry, and industry sets aside funding to facilitate the participation of indigenous and community groups. Two difficulties have emerged: forming a consensus with such a diverse set of stakeholders, and the technical nature of the work forming a barrier to effective participation by indigenous and community groups. The Alberta Government has announced that some of the functions of CEMA will now be handed by governmental agencies in order to speed things along.

As showed in Alberta, cumulative environmental risk management will take on another dimension if it is supported at the central level of government and does not rely on voluntary initiatives of industries. With the support of the UNPEI, MICOA could set up an inter-ministerial commission endowed with analytical capacity to develop a framework similar to that in Alberta.

This unit is important because it would allow:

- 1) a strengthening of the institutional linkages between MICOA and the national planning and policy-making processes
- 2) a greater level of coordination and dialogue among MICOA, Instituto Nacional de Gestão de Calamidades (INGC) and the other relevant ministries and agencies at the provincial and national levels

²³⁹ See Department of Energy website, at <http://www.em.doe.gov/settlement/funding.aspx>

- 3) a constant assessment of environmental impacts, mitigation, and resilience as a cross-cutting, inter-sectoral issue.

The unit could benefit from technical support and the comparative international expertise of the Resource-Based Development Advisory Group, discussed in the conclusion of the report.

3. Public-private cooperation to achieve climate-resilient development

This section focuses on climate risks to development both from natural climate variability and from human activity related to climate change. We include impacts of current climate variability (such as due to current extreme events and seasonal variations) and from climate change over the next 30 to 50 years. Mozambique and the Lower Zambezi Basin suffer from significant climate-related extreme events. Major droughts, floods and cyclones are frequent occurrences resulting in loss of lives and having considerable impact on economic activity. Risks vary by region, but are significant throughout. The Mozambique Ministry of Agriculture notes that “the risk of losing harvests because of unfavorable weather conditions is over 50% throughout the areas of rain fed agriculture south of the Save River, and can reach 75% in the interior of Gaza province.”²⁴⁰ Table 3 provides a summary of impacts of climate-related disasters in Mozambique between 1956 and 2011.²⁴¹ As can be seen, while drought impacts a huge swath of population, the economic damages from drought is far less than from flooding.

Table 3. Climate related disasters in Mozambique (1956-2011).

Disaster type	Total events	Total killed	Total affected	Total damage (US\$)
<i>Drought</i>	12	100,068	17,757,500	50 million
<i>Flood</i>	28	1,926	9,011,072	905 million
<i>Tropical cyclone</i>	13	619	3,574,200	113 million

The variability of climate (within a season and from year to year) also impacts development in climate-sensitive sectors such as agriculture and water resources management. In addition to risks from current climate, anthropogenic climate change is expected to have destabilizing impacts on livelihoods and economy of the Zambezi Valley. According to the Intergovernmental Panel on Climate Change (IPCC), temperatures in the region have already increased by 0.5°C over the past 100 years. Rising temperatures are expected to lead to droughts, heat waves, and crop failures. Rising sea levels are expected to impact seaports and coastal urban areas. An increase in severe weather events is expected to raise the likelihood of flooding along the Zambezi River, enhancing danger to human life and damage to agriculture and infrastructure (see 3.1). In addition, risk of diseases such as malaria and meningitis are likely to increase as droughts and floods create environments more favorable to mosquitoes.

Climate risks, from both current variability and longer-term change, impact development, threatening hard-won MDG gains and creating challenges to investment. Managing climate risks requires effective institutional and policy systems in three inter-related areas, discussed further below in section 3.1:

- (1) proactive management of disaster risks (such as from floods and droughts) in the short term;

²⁴⁰ Mozambique Ministry of Agriculture Strategic Plan for Agricultural Development (PEDSA) 2010-2019

²⁴¹ EM-DAT: The OFDA/CRED International Disaster Database, Université catholique de Louvain, Brussels, Belgium.

<http://www.emdat.be/result-country-profile>

- (2) anticipatory risk management involving risk transfer (such as weather index insurance discussed in Chapter 1, Section 3.2), social safety nets and development programs in key sectors; and
- (3) planning and design of infrastructure and land use for adaptation to climate change.

It is critical for the public and private sector to cooperate in developing the knowledge base and institutional frameworks to better manage climate risks and take advantage of climate-related opportunities. The sub-sections below outline some key areas necessary to ensure that resource-based development in the Lower Zambezi Basin is both sustainable and climate-resilient.

The relationship between climate change and development is not unidirectional; development activities are often correlated with an increase in causal factors of climate change such as deforestation and increased greenhouse gas (GHG) emissions (see 3.4). Therefore, sustainable development should seek to not only address the consequences of climate change, but also to help mitigate the drivers of climate change. The International Council on Mining and Metals (ICMM) has recognized that sustained global action is required to combat climate change, and that public and private sectors must work together to in these efforts. The final part of this section explores opportunities to strengthen policies and programs that promote both economic development and climate change mitigation goals.

3.1 Mitigating climate risks and realizing opportunities: some key areas for action

(a) Disaster risk reduction for climate-resilient development:

Mozambique and the surrounding region are prone to highly damaging extreme climate events such as floods, droughts and cyclones. Each type of event poses risks across many sectors. For example, flooding can affect agriculture by destroying crops and exacerbating soil degradation; increase the risk of diseases such as malaria; damage transportation infrastructure and make road/rail impassable; and result in loss of biodiversity. Moatize Village, Tete, and other low-lying communities along the Zambezi are particularly vulnerable to flooding. Similarly, droughts and cyclones can impact across sectors and scales (household-community-municipality-district-province-country-region). Such consequences impacts not only individuals and their livelihoods, they can significantly effect economic activity and the investment environment. Mozambique's coastal region is a critical component of the country's social fabric and economic success from tourism, fishing and transportation. But it is also quite vulnerable to natural forces (e.g., tides, winds, and storm surges). Cyclones are particularly damaging, and the resulting storm surge, flooding, winds and erosion cause considerable damage to infrastructure, housing and commercial facilities. Economic impact could be quite high with continued development of ports critical for trade and industry (e.g., Beira and Nacala).

Climate-related disaster risks require a suite of planning and management activities. Mozambique's Instituto Nacional de Gestão de Calamidades (INGC) is tasked with managing natural disasters and preventing the loss of human life. INGC coordinates disaster response between entities such as NGOs and other government agencies, ensuring information at the community level is communicated back to the provincial and central offices. While their activities have been successful, INGC (including the provincial office in Tete) could benefit from enhanced training and capacity building. MICOA's National Adaptation Programme of Action and INGC's Synthesis Report on Climate Change (2009) call for developing improved early warning systems for severe weather events. Such a system can utilize meteorological stations of the Ministry of Agriculture and National Institute of Meteorology (INAM). The INGC previously worked with GTZ (now GIZ) and the Sofalal provincial government to launch local Disaster Management Committees and disaster warning radio programming in communities along the Búzi river. The IFRC and local Red Cross branches have built upon and expanded these activities in their

community-based disaster preparedness project. The UNDP is also currently enhancing early warning systems specifically for use in agriculture in Mozambique as part of their four-country “Coping with Drought and Climate Change project”.

(b) Managing weather/climate risks and realizing opportunities for development:

With almost all of its smallholder maize dependent on rainfall, Mozambique is particularly vulnerable to large season-to-season variation in production, as discussed in Chapter 1. Weather and climate anomalies impact critical sectors, while also effecting economy-wide productivity. In addition to strengthening the EWS and improving disaster response, effective climate risk management would entail proactively creating systems that reduce vulnerability to weather and climate variations on the part of both the private and the public sectors. This could include strengthening social safety nets, and developing crop and weather-based insurance mechanisms (as discussed in Chapter 1), in addition to building capacity of institutions to undertake anticipatory risk management. Risks should be considered cumulatively across various spatial and temporal scales (see above sections).

While extreme events can cause significant economic shocks, lesser magnitude variations that are more routine, such as dry spells and wet spells or late onset/early cessation of the rainy season can also cause significant economic impacts. For example, a rainy season might involve below average total volume of rain or may entail the entire seasonal average of rain in just a few intense wet spells. In both cases, crops can be seriously impacted, with critical growth phases having either not enough or too much water. The farming communities in Mozambique currently do not have sufficient capacity to respond to these weather and climate variations. Systems need to be put into place to manage the risks from such weather and climate variability, as have been done in India and elsewhere (see example below). Advance knowledge of weather and climate conditions for the coming days and weeks (and longer) could be used to guide decision-making. This would include responsive systems (in government agencies and private sector input providers) that are sensitive to farmers’ need for credit, fertilizers, pesticides, and market information, and thereby enabling farmers to effectively exercise options in managing weather/climate risk. A high priority of the Government of Mozambique, with the support of the Resource-Based Development Advisory Group, discussed in the conclusion of the report, should be to design and implement a strategy to reduce rainfall-induced production variability.

Using weather and climate information for agricultural risk management in India

An innovative research and action initiative funded by the Ministry of Agriculture in India is aimed at improving climate information particularly for the Indian summer monsoon, and to demonstrate the use of this information to benefit agriculture/rural livelihoods.²⁴² “The Extended Range Forecast System for Climate Risk Management in Agriculture in India project” integrates risk management and climate science research, involving leading institutions in India in climate research and agricultural management (including the Indian Meteorology Department, the Indian Institute of Technology, Delhi, and nine agriculture universities across the country).

Using weather and climate information for agricultural risk management in India- continued

The project adopts a demonstration approach, focusing on select districts (and sample villages) in nine states that face significant livelihood impacts due to climate variability. In addition to furthering climate knowledge base and developing tools to integrate climate information into decision-making, the project

²⁴²

<http://portal.iri.columbia.edu/portal/server.pt?open=512&objID=467&PageID=0&cached=true&mode=2&userID=2#>

focuses on the institutional and policy dimensions necessary to manage agriculture risks (e.g., government and private sector provision of inputs). The Earth Institute of Columbia University is the lead international partner for this project.

Climate information and risk management activities can also be used to take advantage of opportunities afforded by climate conditions. For example, managers at Cahora Bassa dam might be able to release more water for hydroelectricity if forecasts are for increased rainfall in the coming weeks. The ability to smooth gains and losses due to climate variability requires improved climate information (see 3.3) and an institutional framework in which the public and private sector can act quickly and efficiently when provided reliable information (see 3.4).

(c) Adaptation to longer-term climate risks:

Over the long term, climate change is likely to increase the frequency of extreme events and shift patterns of variability (e.g., shift the normal start or end of the rainy season). Risks from a changing climate need to be considered for existing infrastructural investments (such as human habitation, transportation, communication, etc.) as well as for new infrastructure that is being planned. In both of the cases, it is critical to consider climate risks in the context of other ongoing changes such as from population growth and expansion, land use change, ecosystem function changes etc., and calls for enhancing the scientific, planning and policy capacities of key sectoral agencies/institutions (see 3.2 and 3.3).

Proactive climate risk management activities (such as those described above) may be able to support resilience when confronted by cyclones and flooding. However, another serious consequence of climate change is the threat of sea level rise. Rising sea levels not only significantly increase coastal erosion and lead to increased flooding and damage during storm surges, they can also inundate low-lying land. There remains a significant degree of uncertainty in sea level rise extent over the coming decades. Limited data on the historical sea level along the coast of Mozambique makes it difficult to assess trends. Mindful of this uncertainty, the INGC Synthesis Report on Climate Change (2009) suggests that ports at Maputo and Beira would be vulnerable even under a scenario of low and gradual sea level rise in the coming decades. A comprehensive and integrated coastal zone management system needs to be formulated for long-term infrastructure and urban investments. Viewing the coast as a complex of ecological, social and economic systems and requiring the partnership of government agencies, community organizations and private companies, resource-based plans can be designed for climate-resilient sustainability. MICOA's National Adaptation Programme of Action describes elements of this approach in the recommendation to address coastal erosion through participative rehabilitation techniques that emphasize actions to build coast resilience to sea level rise. MICOA also previously implemented an ICZM project in the Mecufi district of Cabo Delgado Province, with a focus on community education and intersectoral coordination. Because of the nature of coastal management, activities should extend beyond an environmental focus and engage partners from across sectors as well as borders (see example below). Here again, the Resource-Based Development Advisory Group discussed in the conclusion of the report could work to design and implement adaptation strategies for high-risk regions of the country and region.

A regional approach to sustainable coastal zone management

With support from the Indian Ocean Commission and the European Union, The Regional Coastal Management Programme of the Indian Ocean Countries (ReCoMaP) supports integrated coastal zone management (ICZM) structures and processes in the coastal countries north of Mozambique as well as

island nations of the Indian Ocean.²⁴³ Through activities such as building or establishing national ICZM committees, facilitating multilateral dialogue, capacity building, and launching monitoring systems, RcCoMaP promotes sustainable coastal development planning and management. The initiative helps to build 1) ICZM tools and approaches; 2) functional frameworks for stakeholders; 3) ICZM coordinating bodies at the national and local level; and 4) platforms for information management and exchange.

3.2 Building science, information systems and capacity for climate resilient development

Whether the goal is to address disaster risk, realize opportunities from favorable climate conditions or develop long-term infrastructure plans, critical elements of risk management include: 1) the quality of the climate and environmental information used; 2) integration of this information into design and decisions (such as in a decision support system), and 3) the ability of agencies/institutions to respond, as enabled by relevant policies, regulations, and institutional architecture (see 3.3). A sound understanding of key environmental, social and economic processes is needed in order to design climate risk management systems. For climate risk management, critical knowledge base can be conceptualized into three categories.

First, a better understanding of current and long-term impacts of weather/climate on development in critical sectors (such as agricultural or hydropower production) This would include understanding of not only direct impacts, but also how weather/climate amplify (or mitigate) other development risks (such as population redistribution, loss of ecosystem function, etc.) in the short and long terms. The efforts could overlap with other related activities, such as the Beira Agricultural Growth Corridor (BAGC) initiative.²⁴⁴

Second, a sound understanding of weather/climate processes, both historical and likely future from seasonal, inter-annual to many decades out. This would enable generation of seasonal and sub-seasonal information based on the past climate record (extremely useful for agricultural planning, for example), as well as the production of forecasts over the longer term (useful for design of infrastructure systems, for example) based on a non-stationary climate. Data collection is critical and can be accomplished by expanding and improving the current network of weather stations in Mozambique and the region (INAM as well as regional agencies mandated by the WMO offering additional support). Additionally, climate information could be integrated with environmental data systems, such as the Globally Integrated Africa Soil Information Service (AFSIS)²⁴⁵ described in Chapter 1. Beyond collecting data, an integrated information system can allow data and research findings to be stored, analyzed, and disseminated to the community of users.

Third, a clear articulation of how agencies and institutions can utilize weather/climate information and effectively implement climate resilient development (for disaster risk reduction, climate risk management and longer term adaptation). Once stakeholders and decision makers have the necessary information, they must be able to understand and act upon it. This requires capacity building and training, as well as decision support systems/tools, and relevant institutional architecture for effective climate-resilient development decision and policy-making.

A research center for climate risk management in Southeast Asia and the Pacific

Housed at the Bogor Agriculture University in Indonesia, the Centre for Climate Risk and Opportunity Management, Southeast Asia and the Pacific (CCRUM) conducts research and training to enhance the

²⁴³ <http://recomap-io.org/home/>

²⁴⁴ <http://beiracorridor.com/>

²⁴⁵ <http://africasoils.net/>

capacity of stakeholders in the region to understand the impacts of climate variability and change, and to better manage risks to improve human welfare and the environment.²⁴⁶ Research focuses on 1) climate impacts and vulnerability in agriculture, health, water resources, and livelihoods; 2) low emissions sustainable development; and 3) climate science and information for decision-makers. As a collaborative institute of the Earth Institute, Columbia University, CCROM emphasizes the multi-stakeholder approach to resource management, seeking to minimize risks and maximize opportunities for government agencies as well as the private sector (e.g., agribusiness companies).

The expertise and experience of the Earth Institute can be leveraged to build capacity of national stakeholders in Mozambique across all three of these critical areas of climate risk management. For example, the Earth Institute has developed a suite of practical exercises and online training materials to help water resources professionals manage climate risks in reservoir systems, as discussed below.²⁴⁷ Training materials could also be developed, in partnership with key line-ministries, for the practical training of planners and policymakers in using climate information in anticipatory decision-making and infrastructure design. The Resource-Based Development Advisory Group discussed in the conclusion of the report could also help to design and implement a training and capacity building program, partnership with regional entities, on climate-resilient development effective across a continuum of temporal scales, from weather and seasonal-interannual to multi-decadal).

Training water resources professionals in climate risk management

The Earth Institute has developed resources to aid water resources managers in implementing a climate risk management approach to improve resiliency to droughts and floods, resolve multi-user conflicts, and contribute to the sustainable achievement of development goals.²⁴⁸ Through a training manual, practical exercises and an online portal, the materials provide a framework for integrating climate information into water resources management operations and decision-making to manage risks and take advantage of opportunities. The risk management approach includes the following steps: 1) assess the hydroclimatic risk; 2) make probabilistic water supply projections incorporating climate information; and 3) determine a portfolio of options to manage the risks. While the materials are largely technical, they also emphasize the role of policy and institutions and offer techniques for working with multiple stakeholders. The training resources have been presented in multiple settings, including directly with water managers in the Philippines and in an international workshop for managers from Latin America.

Another initiative that could support this endeavor is the Climate for Development in Africa Programme (ClimDev). This is a joint initiative by the African Development Bank, the African Union Commission, and the UN Economic Commission for Africa. With the African Climate Policy Centre (ACPC) as its secretariat, ClimDev aims to address the challenge climate change poses for Africa's development objects by filling critical gaps in information, analysis and options for policy and decision-makers at all levels. A Special Fund has been created for activities that address these gaps national and sub-regional institutions, and to support regional activities and climate centers across Africa. The Government of Mozambique and partners in the region are well positioned to take advantage of this substantial emerging initiative to participate in capacity building activities, access climate and related information, and seek support for project implementation.

²⁴⁶ <http://ccromseap.ipb.ac.id/>

²⁴⁷ <http://crk.iri.columbia.edu/water/>

²⁴⁸ Ibid.

3.3 Policy, governance and planning for climate resilient development

Section 2 above outlined guidance for strengthening environmental governance in Mozambique and the region. In the area of climate change, INGC is currently strongly proactive. The National Adaptation Programme of Action channels money through MICOA, and UNFCC²⁴⁹ efforts focus on MICOA as well. Despite this, MICOA remains underfunded and currently lacks relevant expertise. The roles of INGC and MICOA in dealing with climate change initiatives need to be clarified and refined to complement each other, creating coordination for optimal results. Effectively managing climate risks for climate-resilient development requires broadening the focus beyond disasters and environmental management/regulation. It requires a shift in decision-making away from reactive management to one that is science-based and builds upon an anticipatory risk management perspective.

In the context of a changing climate as well as continuing demographic and land use changes, anticipatory, risk-based decision making is becoming increasingly important. Approaches such as integrated water resources management (discussed in Section 1.2.3 of this chapter), which explicitly acknowledge the interconnectedness of problems across multiple sectors and scales, are generally well-suited to accommodate this. Moving beyond climate variability to managing climate change-related risks also requires long-term planning, on multi-decadal scale. Other sections of this report offer additional guidance for planning across temporal scales (see early sections of Chapter 4), sectors, and stakeholders, particularly in pursuit of public-private cooperation (see examples in Chapter 2). The African Development Bank's Pilot Program for Climate Resilience (PPCR) is "designed to demonstrate ways that developing countries can make climate risk and resilience part of their core development planning."²⁵⁰ The PPCR, in line with the NAPA in Mozambique, helps to fund public and private-sector investments in climate resilient development plans, and could be a strong partner going forward. An inter-ministerial body, with the support of the Resource-Based Development Advisory Group (discussed in the conclusion of the report), could draft a strategic national plan, building on ongoing efforts, for achieving climate-resilient development, including the necessary costs, allocations, research needs and partners.

Brazil: High-level institutional, policy and financial support for climate change adaptation and mitigation

The Government of Brazil is using policy, institutions and funds to address the causes and projected consequences of climate change. Brazil's National Policy on Climate Change (2009) establishes a voluntary target for greenhouse gas (GHG) emissions and outlines steps to achieve, monitor and verify emissions reductions, which will come largely from reducing deforestation as well as efforts across many other sectors.²⁵¹ The policy was launched alongside Brazil's National Climate Change Fund, which supports the country's activities to reduce GHG and adapt to climate change impacts.

Brazil: High-level institutional, policy and financial support for climate change adaptation and mitigation- continued

The majority of the funds will come from concession fees paid to the government for companies to work in the country's high production oil fields. These funds will be shared between the National

²⁴⁹ United Nations Framework Convention on Climate Change, the UN agencies principally responsible for climate change activities

²⁵⁰ See <http://www.afdb.org/en/topics-sectors/initiatives-partnerships/climate-investment-funds-cif/strategic-climate-fund/pilot-program-for-climate-resilience-ppcr/>.

²⁵¹ http://www.brasil.gov.br/para/press/press-releases/november/brazil-announces-three-new-initiatives-to-advance-climate-change-policy-and-reduce-national-carbon-footprint/br_model1?set_language=en

Development Bank, which will provide credit for public and private projects on mitigation and adaptation, and the Ministry of Environment, which will focus on public sector initiatives through its Secretariat of Climate Change and Environmental Quality. For 2011, the Fund's approximately US\$140 million will be directed toward projects in agriculture, energy, steel, deforestation and the prevention of fires in critical ecosystems. These priorities are informed by the Brazilian Forum on Climate Change, a high-level government body that brings together representatives from a wide range of government agencies, Ministries, the private sector and civil society to help shape Brazil's public policy and action on climate change.

3.4 Climate change mitigation

With the significant negative consequences of climate change both in the Lower Zambezi Basin and across the globe, there are strong incentives to encouraging activities that contribute to climate change mitigation. Through reducing greenhouse gas emissions, the future consequences of climate change are expected to be mitigated. Additionally, there are opportunities for developing countries and the private sector to benefit from global mitigation programs. This is particularly true for Mozambique.

3.4.1 Reducing emissions from deforestation and forest degradation (REDD)

In a 2009 submission to UNEP, Mozambique expressed concern about increasing deforestation.²⁵² Almost 70% of Mozambique is covered in forest and "other woody vegetation types," but deforestation in Mozambique continues at a rate of approximately 219,000 hectares per year. Deforestation poses a serious threat to local bio-diversity as well as local livelihoods. Also, deforestation may lead to higher levels of soil degradation and erosion threatening agricultural productivity, in addition to contributing to enhanced levels of climate change-inducing GHG emissions.

There are several potential partnerships that may be useful in combating soil erosion and deforestation while working to mitigate climate change. Mozambique stands to benefit from the negotiation of Reducing Emissions from Deforestation and Forest Degradation (REDD), a mechanism designed to create financial value from the carbon stored in forests. In particular, MICOA is involved in South-South REDD, the Brazil-Mozambique Initiative for Zero Deforestation, a project that aims to prepare a national REDD strategy for Mozambique based on the Brazilian experiences of the Bolsa Floresta program. The project is administered and supported by the International Institute for Environment and Development (IIED). An endowment fund for REDD+ will be created within the Ministry of the Environment, and managed by a national private bank. Input for the fund will come from three sources: market (commercialization of carbon credits from the projects), taxes, and donations.

While this is a strong opportunity, Mozambique is regarded as being behind schedule in preparation of the logistics for REDD.²⁵³ These logistics include measuring forest cover, codifying the rights of forest communities, and making laws that address sustainable forest management more effectively. These logistics require more funding to enhance the current partnership between MICOA and Mozambique Ministry of Agriculture (MINAG), Centro Terra Viva (CTV), University Eduardo Mondlane (UEM), the Sustainable Amazon Foundation, Indufor, and Justiça Ambiental (JA) to meet REDD's requirements.

²⁵² http://www.asdk12.org/modelun/Resolutions2009/UNEP_Res1_Mozambique.pdf

²⁵³ <http://uk.oneworld.net>

3.4.2 Reducing GHG emissions: updated standards and green technologies

GHG emissions standards should be clearly enumerated by the government and respected by mining corporations. Coal mining operations have the potential to emit huge quantities of GHGs such as water vapor, carbon dioxide, methane, and nitrous oxide in coal processing and drying, mining procedures, building operations, and transportation of coal. GHG emission can be limited by maximizing gas capture, utilization of hydropower, using electric rail, and incorporation of “green” technology into mine operations. It is important to follow best practices and monitor, verify, and report carbon dioxide and other emissions. Industry may find it best to consider government legislation as a baseline, while preparing for higher standards that may be incorporated into future regulatory schemes.

Whenever possible, coal companies should prioritize clients that use clean coal technology to reduce emissions. In a recent study by KPMG, 57% of mining companies surveyed indicated that they have not changed their structure or management to address climate change issues and also that they are not intending to take such initiatives.²⁵⁴ However, in South Africa a large number of mining companies have implemented “climate-friendly” practices. These practices can be examined and implemented in Tete. In general, “green” technologies should be incorporated into industry activities from the outset to avoid future conversion/retrofitting costs.

Industries can also be incubated to capitalize on the growing market for clean energy and technologies. A recent project by Mitsui in Gaza Province involved the construction of a solar-powered irrigation system for a resettlement community. The system cost approximately \$2 million. The UNDP will be placing a specialist there to help the community market the system. Such a project in Tete Province could increase power production, decrease dependency on coal-generated power, and provide a steady water source for local farms.

²⁵⁴ “Miners have ‘wait-and-see’ approach to climate change,” MiningWeekly.com 1/31/2011

4. Conclusion and summary of recommendations

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Strategic cumulative impact assessment (CIA) study, and monitoring program	<p>Joint initiative to assess cumulative environmental direct impacts of mining operations as actually experienced by local communities and stakeholders (water pollution and water resource management, air pollution and greenhouse gas emissions, soil and land degradation, and effects on biodiversity)</p> <p>Expanding the CIA to include competitive use of water and land to inform policy making related to water and land use, using GIS and to be coordinated at cross-border level, especially for cross-border warning system for flood alerts and integrated water resource management plan (IWRM)</p>	MICOA, MPD, Min. of Agriculture	AMDCM, Mining Companies, SDI unit	UNEP, UNIDO, WMO, GSDI, ACWR, Impacto, Consultec
Strengthening environmental governance	<p>Investing in technical assistance for government employees involved in environmental assessment and licensing at national and local level</p> <p>Updating the legal and regulatory regime, maximizing environmental protection while promulgating realistic guidelines (1) establishment of stringent emission and pollution limitations, 2) assessment of water concession period and value of assurance bonds according to cumulative impacts of mines</p> <p>Designing enforcement mechanisms (1) audits before license renewal, 2) continuous monitoring of industrial activities, 3) applying significant penalties for environmental violations, 4) enshrining transparency in system and 5) ensuring better public participation and oversight)</p> <p>Adopting CIA at Ministry level (through an inter-ministerial unit in order to strengthen institutional linkage and assessment of environmental challenges as a cross-cutting issue)</p>	MICOA	Industry, Government, Civil Society Organizations, National Universities	UNDP, UNPEI, Earth Institute/ Columbia University
Public-private cooperation to achieve climate-resilient development	<p>Mitigating climate risks and realize opportunities through 1) disaster risk reduction; 2) managing climate risks with systems reducing vulnerability, with an emphasis on strategies to reduce rainfall-induced production variability; and 3) adaptation to climate change, with a focus on high-risk areas and sectors</p> <p>Building science, information systems and capacity with a focus on 1) impacts of weather/climate on development; 2) climate processes and science, including forecasting; and 3) techniques for integrating climate information into decision and policy-making</p> <p>Making the climate risk and opportunity management approach an integral part of development policy, planning, and governance with an emphasis on public-private cooperation and multi-stakeholder engagement</p> <p>Mitigating climate change by 1) pooling resources to fund improvements in the logistics of operations required by the implementation of REDD; and 2) GHG emissions standards enumeration by the government, respected by mining companies (technical solutions to incorporate green technology into activity industries or carbon-offsetting programs)</p>	MPD partnering with MICOA, INGC, Min. of Agriculture,	National Institute of Meteorology (UNAM), NAPA, Other Ministries, Private sector (including insurance/finance industry, agriculture supply chain, etc.) REDD partnership, UEM, Civil Society Organizations	UNFCC, AfDB, IIED, UNDP, , Earth Institute, the African Centre of Meteorological Applications for Development (ACMAD), WMO, IGAD Swiss Re, IFRC, WB, CLIM DEV, Forum for Agricultural Research in Africa (FARA), ENDA.

Chapter Four: Resource-Based Development Planning and Revenue Management

Introduction

The manner and extent to which the anticipated benefits of large investments in natural resources actually accrue to host countries depend heavily on the government's capacity to plan for the upstream and downstream linkages and to manage the revenues according to sound fiscal and development policies. If properly planned for and managed, the resources in the Zambezi Valley can have a rapid and direct impact not only on generating revenues, but also on regional infrastructure, job creation, agricultural productivity, health, and Mozambique's progress in achieving the Millennium Development Goals, as discussed in Chapters 1 and 2. If mismanaged or not properly planned for, Mozambique could miss the opportunity to reap the benefits of resource extraction, or worse, suffer from the "resource curse" in which resource extraction fails to contribute to national development and even results in adverse development consequences. The challenge, therefore, is to determine the proper development framework to turn resource wealth into effective and sustained economic development. Taking into account the reality of resource depletion puts an added premium on finding the right policies to maximize the development impacts.

A government strategy for managing resource revenues and facilitating linkages includes long-term development planning tools that define the needs and priorities for public-sector investments over the long, medium, and short terms; tools to properly model and anticipate revenue flows, including from the extractive sector; budgetary and planning tools to link plans and budgets in the short and medium terms; proper monitoring and evaluation systems to measure the results of public investment programs; and improved coordination among the various stakeholders involved in planning, including line ministries, the Ministry of Finance, the private sector, the donor community, provincial and municipal governments, and civil society.

Each country has its own unique system for managing its revenues and strengthening its planning and budgetary processes for improved development outcomes. There are, however, basic elements that can be adapted to all contexts, including Mozambique, for resource-based development planning:

- **Clear and consistent National Development Plans** over various time horizons that include a medium-term public investment strategy (prioritizing key areas for investment), annual targeted plans and projects, and strategies for leveraging extractive industry investments
- **Transparent budgeting tools** that are tied to a strong medium-term expenditure framework and are driven by development needs and costed investment programs, as well as tools to improve budget execution
- **Financial modeling** of anticipated revenue flows and expenditures over the medium and long terms, especially of resource revenues which should be based on various anticipated scenarios and pricing models
- **Inter-ministerial coordination** under the leadership of a coordinating minister, setting policy priorities and serving as a strong partner for counterparts in the private sector, donor community, and civil society

- A strategy for the *use and/or distribution of resource revenues* over time and among various populations.

1. Medium- and long-term planning for resource-based development

The mega investments in natural resources in the Zambezi Valley provide an important opportunity for Mozambique to translate the region's subsoil assets into fiscal revenues, infrastructure, employment, training, and other benefits in a manner consistent with its long-term development goals. However, as a recent publication noted, "it seems to be simply taken on faith that growth and revenues will produce these benefits."²⁵⁵ For decades, developing countries have been advised that encouraging foreign investment in their natural resource sectors would have a natural multiplier effect on an economy and would attract further foreign direct investments in key supporting sectors, including infrastructure, ports, downstream industry, and telecommunications.

As a result, these countries have been advised to focus on improving "doing business" indicators to attract investors to the natural resource sector, without emphasizing the need for a more complex supportive environment of policy, regulation, long-term planning, and a public investment program to complement the private investments. Indeed, in Mozambique, the mega-projects have been supported based on their promise to create employment and to support local small- and medium-sized enterprises (SMEs). However, the results of this market-led approach to resource-based development, both in Mozambique and elsewhere, have not been as promising. To date, job creation from the mega-projects remains well below expectations,²⁵⁶ and with few exceptions, the mega-projects have not effectively integrated with local SMEs.

In practice, avoiding the resource curse and maximizing development outcomes of investments in resource extraction requires a strong public sector and long-term government planning that addresses how the natural resources will factor into the country's long-term development objectives. Specifically, when anticipating a surge in investments in oil or mining, governments should concretely and concurrently plan for:

- shared infrastructure opportunities
- coordinated investments in local supply bases for goods and services to the industry
- vocational training related to the industry's employment needs
- maximizing local and national tax and royalty revenues
- resource management and allocation strategies
- present and future domestic needs for the resource itself (whether oil, coal, minerals, or metals)
- exchange rate fluctuations and other macroeconomic implications
- cumulative environmental risks and impacts, with a focus on climate risks and opportunities

Unfortunately, to date, most planning documents of resource-rich countries, including those developed in partnership with the traditional donors (such as the World Bank Country Assistance Strategies and Poverty Reduction Strategy Papers), have not focused on the particular opportunities (and risks) of resource-based development, including "how mining will, in specific terms, fit into a broader

²⁵⁵ Slack, Keith. "The Role of Mining in the Economies of Developing Countries: Time for a New Approach." *Mining, Society, and a Sustainable World*. Ed. Jeremy P. Richards. Berlin: Springer, 2009.

²⁵⁶ Since 1992, ten "mega-projects," mostly in natural resource extraction, have accounted for about 70 per cent of foreign direct investment (FDI) inflows, but for only 5 per cent of FDI-generated jobs. UNCTAD, *Foreign Direct Investment in LDCs: Lessons Learned from the Decade 2001-2010 and the Way Forward*, April 2011.

development strategy for a given country... [creating] a situation in which the linkages to the rest of a country's economy are simply assumed rather than clearly articulated."²⁵⁷ This has been true in Mozambique as well. The PARPA II specified that the government should create an investment framework that attracts mining investments, but no mention was made (nor strategy included) about how such investments could be incorporated into the medium-to-long term development strategy, nor how revenues from the sector would be allocated in line with the development priorities.

The section immediately following the short "mining" section in PARPA II treated the petroleum sector slightly differently; in terms of petroleum investments, the PARPA's strategy included "ensuring rational and efficient use of production and transportation infrastructures; ensuring the development of the domestic market for natural gas, condensed natural gas, and other oil products; ensuring the education and training of Mozambicans to participate in all stages of oil operations, including the provision of goods and services to the oil sector; fostering regional cooperation with neighboring countries and ensuring the unitization and exploitation of common resources in a coordinated manner; the development of an efficient regional natural gas market, the use of common technical standards..."²⁵⁸ The discrepancy between this slightly more detailed strategy and the lack of a strategy for integrating mining investments may be due to the timing of the PARPA II drafting, in 2006-7, when the mining sector was still nascent. **However, the goals articulated in the PARPA II for the petroleum sector should be extended to the mining sector as well, including for coal (energy) and phosphates (fertilizer), and in both cases (petroleum and mining), the policy objectives should be translated into concrete actions, regulations, public investment programs, budgetary allowances and development targets.** Moreover, the plans for both sectors should articulate how resource revenues will be allocated in line with these overall objectives. The PARP 2010-2014 is shorter than the previous PARPAs, and no mention is made of either the mining or the petroleum sector in the PARP 2010-2014, finalized in May 2011.

1.1 The benefits of long-term planning in resource-rich countries

Long-term planning is particularly important in resource-rich countries, since extractive industry activities often have time horizons of several decades or more. Each stage of the project life-cycle of extractive industries—exploration, construction, production, beneficiation, closure—has distinct implications for the host country and community, both in terms of impact (environmental, economic, and otherwise) and opportunities for spill-over benefits (infrastructure expansion, training, etc.). Accordingly, governments need long-term planning tools to anticipate and correspond with the various stages of the project, including, for instance, coherent, multi-sectoral development strategies, a costed medium-term public investment program with adequate budgetary support, and a strategy for the management and allocation of revenues. In light of the anticipated scale-up of extractive industry activities in Mozambique, there is already national momentum to implement long-term planning mechanisms that anticipate the long-term time horizons of the extractive industry activities. There are many benefits of this type of long-term planning in resource-rich countries:

First, given the inherent instability of resource prices as well as the eventual depletion of the resource, a national macroeconomic strategy and budgetary framework is necessary to preserve both short-term stability and long-term solvency in an economy heavily dependent on commodity exports.

²⁵⁷ Ibid.

²⁵⁸ PARPA II, 2 Feb, 2007, para 555.

Second, public planning can help to avoid “Dutch Disease,”²⁵⁹ by using revenues from the resource economy to support a supply-side response of both non-tradable sectors—such as education, health, and social security—as well as non-resource export sectors—such as agriculture—through public investments in infrastructure, technical training, and business development.

Third, medium- and long-term public investment programs can complement private-sector investments, thereby maximizing the benefits accruing to the host country and even increasing the profitability of the private investments. For instance, a public investment framework that includes strategic investments in key infrastructure, education and training, and human capital can facilitate private investment not only in the extractive sector but in complementary sectors as well.

Fourth, the stability of large, long-term investments relies to an extent on its ability to deliver development benefits to the local population. The private sector, therefore, has an interest in ensuring that its payments to the government are channeled into strategic public investments with notable development results for the local community. Thus, long-term development planning is not at the expense of an enabling environment for private investment; to the contrary, a strategic planning process can help ensure that the basic building blocks are in place to both attract quality private investment and to ensure that the benefits of the investment flow to the population.

While economic development undoubtedly requires private-sector investments and participation, it also depends critically on the provision of core public goods; therefore, Mozambique’s overarching priority is to create a public investment plan that will “enable the economy to meet basic needs (food, safe drinking water, essential health services, basic education) and to put in place the infrastructure (power, irrigation, roads, ports, telecoms, the Internet) for private-sector-led economic growth.”²⁶⁰ Through targeted public investment strategies, natural resource revenues can be used to improve productivity and economic growth alongside the natural resource sector.²⁶¹

A major challenge for those who favor strategic resource-based development planning is the reality that many developing country governments lack the technical expertise and tools to undertake a rigorous assessment of the public investment gaps of the country, especially at sub-national or supra-national (regional) levels, or to prepare a costed public investment program to address those needs in the near and medium terms. Therefore, the opportunities to support Mozambique’s planning process are discussed below.

2. Coherence of planning tools

Mozambique has several planning and budget documents, prepared by various units and covering different time horizons (see Box 1 for an overview of the main planning documents at the central government level). The dozens of planning documents in Mozambique at the central government level—and even more at the provincial and municipal level—outline the main priority areas, plans, and

²⁵⁹ Dutch Disease primarily arises when resource wealth is used for consumption rather than for public investment. The solution, therefore, lies in a long-term public investment strategy focused on generating growth and productivity in the non-commodity export sectors that are central for poverty alleviation (including food production, health, education, infrastructure). Sachs, Jeffrey D. "How to Handle the Macroeconomics of Oil Wealth." *Escaping the Resource Curse*. New York: Columbia University Press, 2007.

²⁶⁰ Sachs, Jeffrey D. "How to Handle the Macroeconomics of Oil Wealth." *Escaping the Resource Curse*. New York: Columbia University Press, 2007.

²⁶¹ Bucuane, Aurelio & Mulder, and Peter. *Exploring Natural Resources in Mozambique, Will It Be a Blessing or a Curse?* 2007.

costs for government programs and spending over the short (PES and State Budget), medium (PARP, PQG and sector strategies) and long term (Agenda 2025). The national planning and budgeting exercise is coordinated by the Ministry of Planning and Development (MPD) and the Ministry of Finance, respectively.²⁶²

Planning and Budget Documents in Mozambique²⁶³

2025 Vision: The 2025 Vision, concluded in 2003, reflects the long-term vision of the country.

Five-year Government Plan (PQG): This document is prepared by each new administration and outlines the government's key objectives and priorities during its term (five years).

National Poverty Strategy (PARP or PRSP): The medium-term plan, which includes priority objectives to reduce the poverty rate. The new PARP, to be completed in April 2011, attempts to operationalize the PQG.

Medium-term Expenditure Framework (CFMP or MTEF): The MTEF theoretically guides the planning and budgeting process and defines budget ceilings. It is updated annually for a three-year cycle.²⁶⁴

Sector and Provincial Plans: These are medium-term strategic plans for each ministry or province, which contain priorities for a five-year period.

Economic and Social Plan (PES): This annual plan, included within the state budget each year, translates the government's overall development plans (PQG and PARP) into annual activities linked to its sectoral plans.

State Budget (OE): The annual budget outlines the funding sources and costing of activities in the PES.

2.1 Aligning the key objectives, priorities, and actions of each of the planning documents

The planning documents are intended to be interlinked; indeed, the priorities, strategies, plans, actions, and budget should be internally consistent and increasingly operational (as the time horizons get shorter) in order to maintain coherence for the public investment strategy and to enable a transparent, predictable, and accountable budgeting and reporting process. However, in practice, partly because of the different administrative units that are responsible for their drafting, the plans lack coherence, consistency, and analytical context (for identifying and prioritizing public investment strategies) that would facilitate their implementation, appropriate budgetary allocations (both from national revenues and donor support), and effective monitoring and evaluation (M&E). For instance, while the PARP is prepared through intensive discussions between the MPD, line ministries, and development partners, the annual PES (which should be an annual operational tool for the medium-term goals) is prepared on the basis of a series of proposals from central level and provincial level directors that are consolidated at various points and ultimately sent to the MPD. The MPD further consolidates the submissions and presents the final consolidated PES to the National Assembly without final review by the submitting ministries at the central or provincial levels.²⁶⁵

²⁶² Prior to 1994, the Ministry of Finance and National Planning Commission were separate; however, they were unified in 1994 into a Ministry of Planning and Finance (MPF) to centralize responsibility for both capital investment and recurrent expenditure programming in one ministry. In 2006, however, MPF was split into two ministries. Paolo de Renzio, "Can Donors 'Buy' Better Governance: the political economy of budget reforms in Mozambique," *Cadernos IESE* N. 9, April 2011, p. 11.

²⁶³ *Republic of Mozambique: Report on Observance of Standards and Codes— Fiscal Transparency Module*. IMF Country Report 08/152. May 2008.

²⁶⁴ Although the CFMP (Cenário Fiscal de Medio Prazo) translates literally into a medium-term fiscal framework, the CFMP outlines the sectoral allocation of spending and program costs at the sector level, and therefore fits the definition of a medium-term *expenditure* framework.

²⁶⁵ Agriculture Public Expenditure Review.

Several options and recommendations for improving the efficacy of the planning and budgeting process are discussed below, but two central observations could usefully be made here. **First, as Mozambique concludes the third PARP for 2011-2014, there is an opportunity to streamline the government's planning process to focus on the priority strategic issues, with a medium-term time horizon, in line with the ambitious but achievable targets of the MDGs.** Sectors could be encouraged to bring their own strategic plans in line with the PARP objectives and priorities for the same time-period,²⁶⁶ and the PES should refer to the specific priorities outlined in the PARP, ensuring coherence in strategic priorities, policy objectives, budgets, and annual milestones.

Second, the new PARP could create an institutional framework for strategically engaging traditional and non-traditional donors, the private sector, and the various sectors in a coherent, comprehensive development strategy. As the World Bank recently noted, "more comprehensive, multi-sector investment planning methods which are capable of exploring, identifying and effectively mobilizing synergies within and across geographic areas (national and regional), economic sectors, and socio-economic groups have become today essential methods in the poverty reduction 'tool box' in developing countries. While such comprehensive methods... are more complex and expensive to undertake, they invariably yield much higher and more sustainable benefits to the local, sub-national, national and regional communities."²⁶⁷

In this context, a Public Investment Program (PIP) could help to identify public investment projects of key strategic importance—such as those necessary to achieve the objectives of the PARP—and to determine the available and desirable means of financing those priorities over the medium term, including through the budget, off-budget project support from traditional donors, assistance from non-traditional donors, public-private partnerships, or borrowing (at concessional or non-concessional rates). The PIP could then serve as the basis for discussion and engagement with donors and the private sector, ensuring that the donors and private sector are supporting the Government's plans and priorities rather than dictating them. The PIP would be a key component of an enhanced and meaningful medium-term expenditure framework (discussed in depth below).

2.2 Streamlining monitoring systems

A streamlined planning process should be based on and should reflect a robust and coherent monitoring and evaluation (M&E) system that enables transparent monitoring of outcomes and results.

Currently, the M&E tools and oversight is fragmented in Mozambique, reflecting the various actors (donors, central government, sectors, sub-national governments, private sector) and types of planning documents and activities. At the national level, there are at least three systems for reporting on the results of the various plans for public expenditure:

- 1) the Balanco do Plano Económico e Social (BdPES), which reports on the execution of the annual Economic and Social Plan, and is presented to Parliament and discussed in a plenary session,

²⁶⁶ There is often a multiplicity of plans at the sector level as well. For instance, the framework for the Agriculture sector is built on the guidelines contained in eight key documents: the Agricultural Policy and Implementation Strategy (PAEI); the Poverty Reduction Action Plan (PARP 2010-2014); the 5-Year Government Programme 2010-2014; the Green Revolution Strategy; the Food Production Action Plan (PAPA); the Rural Development Strategy (EDR); the Food and Nutritional Security Strategy (ESAN), and the Strategic Plan for Agricultural Development (PEDSA 2010-19).

²⁶⁷ Project Appraisal Document, 7 Sep, 2010.

- 2) the Annual Performance Assessment Framework (PAF), a set of 40 indicators defined by the main donors, which is prepared annually with the donors in working groups, and is presented to the development partners (not to parliament),²⁶⁸ and
- 3) the PARP strategic matrixes, which are annexed to the BdPES, submitted to Parliament, summarizing key monitoring aspects in priority areas.

In addition, there are myriad M&E and reporting tools used by the sub-national governments and by individual line ministries, many of which have their own indicators. Even some of the technical divisions *within* a ministry have their own indicators. When line ministries receive direct funding from donors, either bilaterally or through Sector-Wide Approaches (SWAPs) or common funds, often the Memorandum of Understanding will contain additional indicators and reporting requirements, which can run parallel to national systems and processes. Often, the ministries will align their M&E and reporting priorities according to the donors' requirements, to ensure continued funding, rather than with the national systems. Not only does this undermine national level reporting, but information collected and reported for donors is often compiled simply to meet requirements, meaning that "little effort is put into analyzing the information collected or applying analysis to policy making."²⁶⁹

M&E activities at each level of government (district, provincial, sector, and central) are often divided among several directorates within the same body. When one agency or sector is required to submit consolidated indicators, often the indicators are consolidated in the same way as the PES—by accumulating and consolidating indicators from a number of different sub-units, which often results in misinformation or dropped data.

At the national level M&E activities are divided among several directorates within the Ministry of Planning and Development (MPD), including the National Directorate of Planning, the Directorate of Policy Studies and Analysis, a new National Directorate for M&E, and the National Statistics Institute (INE). Not only are the current M&E processes administratively burdensome, but the fragmented system exacerbates disparities among development plans and activities (including those of donors and the private sector), and weakens the ability of any of the development actors to rely on accepted outcome and process data and fixed targets, or to use them meaningfully to inform policy.

Moreover, this fragmentation is exacerbated by widespread difficulty in linking budget and fiscal information with outputs and indicators. This is in part because of the institutional separation between the administrative units responsible for budgeting, planning, and M&E, resulting in the lack of information-sharing, but it is also due to the lack of accurate unit-cost estimates that allow for budget-outcome analysis.²⁷⁰

²⁶⁸ "Sufficient progress" on these indicators is the condition for the continuation of budget support. The Memorandum of Understanding (MoU) between the main donors and the Government is also based on another set of conditions, called "basic principles" of governance, which are considered in the annual review process alongside the PAF indicators.

²⁶⁹ "Minding the Gaps: Integrating Poverty Reduction Strategies and Budgets for Domestic Accountability," The World Bank et al, April 2007, p. 96.

²⁷⁰ Paolo de Renzio and José Sulemane, "Integrating Reporting of PRS and Budget Implementation: The Mozambican Case," Discussion papers No. 38E, National Directorate of Studies and Policy Analysis, Ministry of Planning and Development, Republic of Mozambique, March 2007.

Unit-costs are the cost per targeted investment; for instance, the cost to train one teacher, or the cost to build a clinic. Unit-cost estimates are necessary to be able to accurately cost public investment programs and also to be able to evaluate the impact per cost of specific public investments.

Both the development partners and the private sector have an interest in strengthening the M&E system in Mozambique, in order to base development programs and activities on agreed targets, metrics, and policy outcomes, and to enhance their own reporting on development initiatives. **Therefore, it could be useful for the private sector, civil society, government representatives from the MPD as well as from the sub-national directorates, and the donor community to increase the meaningful acceptance and use of M&E systems and data for policy and outcome analysis, streamline the M&E process, take joint steps to increase the rigor of statistical data collection and analysis, and then standardize M&E indicators and processes in line with the development priorities, to improve the coherence of the development activities and reduce redundant reporting and administration.** And indeed, strengthening and clarifying the linkages among levels and types of M&E and between M&E and planning, as well as strengthening the analytical ability to relate public policy with results and outcomes was a key objective of PARPA II and is included in PARP 2010-2014.²⁷¹

3. Aligning the budget with development plans

The success of Mozambique's development planning relies on the strong coordinated development of the public financial management (PFM) system. The IMF noted in its 2008 Public Expenditure and Financial Accountability report (PEFA) report that, in general, the last decade was characterized by substantial improvements to Mozambique's PFM system. Perhaps most notably, the Government introduced a single treasury account (CUT) and a new electronic integrated financial management information system, e-SISTAFE, that have substantially improved the public financial management system. Other important improvements include a new financial management law with accompanying regulations, a more functional classification system for the budget, and the incorporation of off-budget revenues and donor-funded expenditures into the budget, among others.²⁷² Steps are still being taken to improve these processes, in close coordination with the IMF, World Bank, and other development partners.

3.1 The usefulness of medium-term expenditure frameworks (MTEFs)

The complex landscape of planning instruments and procedures in Mozambique could benefit from increased integration in a multi-year budgeting process, which would facilitate the policy coherence and planning capacity of the different planning units. Medium-term expenditure frameworks (MTEFs) can "create a useful bridge between planning and budgeting," and should be at the core of medium-term policy making and decisions about development priorities and resource allocation.²⁷³

An MTEF is used to "forecast the overall resource envelope [based on fiscal targets, estimated revenues and financial obligations], and to allocate spending among sectors for the medium term according to the

²⁷¹ PARPA II, Feb 2, 2007, section 621(b).

²⁷² Project Appraisal Document, 7 Sep, 2010.

²⁷³ Allen, Richard. "Planning and Budgeting in Developing Countries - "Shrinking the P"" 31 Jan. 2011. Web.

<http://blog-pfm.imf.org/pfmblog/2011/01/planning-and-budgeting-in-developing-countries-shrinking-the-p.html>

policy priorities set out in the five-year plan and the PARP.”²⁷⁴ MTEFs allow multi-year budgeting and planning, which almost all major *public investment strategies*²⁷⁵ require, both for their design and implementation, and for their success. The objectives of an MTEF are highlighted in the box below.

The Objectives of an MTEF²⁷⁶

- Improved macroeconomic balance, especially fiscal discipline
- Greater budgetary predictability for line ministries
- More efficient use of public resources
- Greater political accountability for public expenditure outcomes through more legitimate decision-making processes
- Greater credibility of budgetary decision-making (political restraint)

In order to be credible and meaningful, the MTEF should be integrated into both the planning and the budgeting process. The first step would be to think about an integrated sectoral strategy for realizing the priorities as established in the PARP, and determining which public investments are necessary to achieve the objectives. Those public investments should then be costed, to determine the necessary resource allocation (both by sector, and between capital and recurrent expenditures) over a medium-term time frame. A similar costing exercise should be undertaken in the other sectors as well, since all sectors have multi-year strategies that a) can be costed, and b) would benefit from a multi-year resource allocation that is in line with real estimated costs.

Based on these costed plans, the government would then determine sectoral allocations, which in turn become both the guide and the budget ceilings for the sectors’ programs and budgets over the medium term.²⁷⁷ **The annual budget would effectively be the first year of the MTEF, and the outer years of the MTEF would guide the budget allocations in subsequent years. Not only does this bring coherence to the planning and budgeting process, but it would make budget allocation decisions more accountable, transparent and predictable.**

Currently, the MTEF in Mozambique operates tangentially to the planning and budgeting process, and is not yet institutionalized as a meaningful planning and budgeting instrument. The MTEF was not used in the preparation of any of the medium-term plans, nor are the priorities as articulated in those documents reflected meaningfully in the MTEF. The sectors do not present a cost analysis of their programs for the MTEF, but rather present proposals on their total sector expenditure; those proposals are moreover de-linked from the list of activities submitted for the annual PES, which, in turn, is often unrelated to the sectors’ own strategic plans. **Put another way, there is no clear connection between the priorities outlined in the PARP, the sectors’ own medium-term strategies, the overall expenditure**

²⁷⁴ “Minding the Gaps: Integrating Poverty Reduction Strategies and Budgets for Domestic Accountability,” The World Bank et al, April 2007, p. 96.

²⁷⁵ While annual budgets can be sufficient for annual consumption expenses, public investment strategies require a number of medium-to-long term considerations: a) the estimated social returns on various kinds of medium-term investments, b) the capacity of the government to carry out a multi-year public investment program, c) the possible excessive management costs of public investments if they are too concentrated within the same time-span (in terms of oversight, management, etc.), d) the dangers of illiquidity if large public investment programs are undertaken simultaneously without adequate medium-term expenditure planning, and e) the medium-to-long-term hidden operations and maintenance (O&M) costs associated with capital investments.

²⁷⁶ Philippe Le Houerou and Robert Taliencio, “Medium Term Expenditure Frameworks: From Concept to Practice. Preliminary Lessons from Africa,” Africa Region Working Paper Series No. 28, February 2002.

²⁷⁷ Ibid.

proposals submitted by the sectors for the MTEF, the list of activities proposed for the annual PES, and the costs submitted for the annual budget allocation. In fact, each of these plans or budgets is often created by a different department within ministries.

At the central level in Mozambique, the PES and the annual budget take priority over the MTEF; the annual budgetary ceilings for the annual budget are more linked to the PES than to the budgetary ceilings defined in the MTEF (though, in fact, more accurately, the budget ceilings have tended to be based on incremental additions to the budget of the previous years rather than on the basis of any plan). As a result, “there is no real medium-term dimension to the budget in Mozambique, neither for revenues nor for expenditure.”²⁷⁸ Both requiring and assisting sectors in submitting *meaningful* medium-term budgeted proposals, based on their strategic plans and the overall priorities of the PARP, would strengthen the usefulness and coherence of the MTEF, and would be an important step toward aligning the various development strategies, objectives, action items, and budgets.

Importantly, the **costing for an MTEF should encourage the Government and development partners to think about what expenditure *should be* to realize development objectives; although maintaining macroeconomic stability is certainly important, there are a number of resources that may be mobilized to support necessary expenditures that may not be anticipated in a fiscal framework.** Once necessary expenditures are costed, the MTEF should be used to connect the necessary expenditures to financing options, including projected revenues, donor support, private-sector investments, and concessional and non-concessional borrowing, on an annual and multi-year basis.

It should be noted that in addition to meaningful costing estimates in line with sectors’ strategies and government priorities, an effective MTEF relies also on other important aspects of budget management.²⁷⁹

Consistency between budget submissions, allocations, and execution: If budget allocations differ significantly from the budgets prepared for submission, then the budget preparation process loses credibility and incentive. This is reportedly the case in Mozambique, where budgets approved are different from the budgets submitted by ministries and other sub-national units. Moreover, if actual expenditures differ from the approved budgets, that further undermines the predictability and accountability of the budgeting process. Finally, this becomes true of the MTEF process as well if there is no coherence between the allocations and the MTEF submissions, which is currently the case in Mozambique.

Comprehensiveness of the budget: The budget and the MTEF should account for all public expenditures, including donor funds and other off-budget financing. If the budget and MTEF are not comprehensive, then their usefulness is minimized.

MTEF approval process: In order for the MTEF to be meaningful, it should be approved by the cabinet and parliament, ideally as part of the budget presentation and adoption.

²⁷⁸ *Aid and Budget Transparency in Mozambique: Constraints for Civil Society, the Parliament and the Government.* Rep. May 2010. http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Aid_Budget_Transparency_in_Moz.pdf

²⁷⁹ Philippe Le Houerou and Robert Talierno, “Medium Term Expenditure Frameworks: From Concept to Practice. Preliminary Lessons from Africa,” Africa Region Working Paper Series No. 28, February 2002.

Ultimately, Mozambique's ability to link its development plans within an effective and meaningful MTEF, and subsequently to annual budgets, is decisive for economic diversification, poverty reduction and sustainable development. Several development partners have assisted Mozambique with public financial management reform, including the MTEF process, since 1997; at times, this support has been centralized either in common funds (such as the UTRAFE common fund for budget reforms) or around key budget priorities (the establishment of a unified treasury account, program budgeting, etc...). **Additional coordinated technical assistance could now be useful to strengthen the MTEF as a meaningful connector between the budgeting and planning systems.**

Because detailed costing of sector activities is a difficult undertaking, development partners could help support the costing of the PIP, which should reflect the priority PARP objectives (as described above), as a pilot project. This pilot MTEF-support initiative could include support for a rigorous costing of the PIP (including distinguishing between capital and recurrent expenditures), determining the relevant sectoral allocations, and then working with the Ministry of Finance and other development partners to align existing projects and resources with the expenditures and identifying other possible revenue streams.

A simultaneous priority is to establish institutional arrangements that facilitate communication and coordination between the MPD and the Ministry of Finance vis-à-vis the MTEF, and the planning and budgeting processes more generally. The IMF, World Bank and other partners could usefully bring comparative experience of other countries with separate ministries responsible for planning and budgeting, such as Turkey, to help improve the planning and budgeting coordination in Mozambique. Moreover, development partners should commit expenditures in line with MTEF priorities, which would yield substantial returns on the Government's development planning and allocation of resources.

3.2 Strong leadership and inter-ministerial coordination

The Ministry of Development Planning and the Ministry of Finance have taken important steps to coordinate their respective responsibilities in planning and budgeting to promote consistency, but there remain opportunities to harmonize the planning process further, both between the MPD and Ministry of Finance and between the provincial governments and the central government. In terms of coordination between the provincial governments and the central government, efforts are needed both to ensure consistency of planning and strategy among the different levels of government and to ensure that sub-national resource allocations result in efficient and effective service delivery at the field level.²⁸⁰

Several efforts are already underway to improve coordination between ministries and among the different levels of government, so they will not be addressed again in depth in this report. An additional reform that could usefully be implemented would be to create **an inter-ministerial planning commission, tasked with supervising the PIP (identifying priority investments, and overseeing a costing exercise for public investments in those priority areas); overseeing a fiscal and statistical analytical unit; ensuring internal consistency among the planning tools (including, and especially, between the annual budget and the MTEF), and beginning the process of streamlining the various planning documents and tools at the central level (including with long-term development priorities and among the sector plans).** Such a planning commission could mobilize the diverse expertise of the Resource-Based Development Advisory Group, discussed in the conclusion of the report, to support strategic policy making, financial modeling, and data analysis at a high level. Moreover, the commission

²⁸⁰ Fozzard, Adrian. *How, When and Why Does Poverty Get Budget Priority, Poverty Reduction Strategy and Public Expenditure in Mozambique*. ODI Working paper no. 167. 2002. Print.

could serve as a coordinating body for high-level discussions among the line ministries, private sector, and donor community—especially as they relate to the mega-projects and capital investments of the public investment program. Currently, the MPD is undertaking a mapping of the National Planning System. This is a critical first step toward establishing such a commission, and the efforts of the MPD in this respect should be supported.

4. Effective management of resources for sustainable development

The first steps toward preparing a robust MTEF are modeling the available resources, including disaggregated accounting of and modeling of tax and other revenues, donor support, extra-budgetary funds and quasi-fiscal activities, such as private-sector expenditures. The broad medium-term macroeconomic projections (based on transparent and realistic assumptions), aggregate fiscal targets and major fiscal risks should also be transparently reported and explained in the MTEF.²⁸¹

Quasi-fiscal activities include investments in infrastructure, human capital or training, special development funds, or corporate social responsibility projects.

4.1 Anticipating and managing resource revenues

Revenue management is a huge task for all governments, and extractive resources add an additional level of complexity, given the volatility of the revenues and their non-renewable nature. The volatility and uncertainty about future production makes yearly budgetary planning more difficult, and the exhaustibility of the resources makes the management of revenues more important. For Mozambique, for which the natural resource sector will increasingly represent a larger portion of Mozambique's economy with corresponding implications for public accounts and budgetary resources, it is critical for the fiscal framework to include both disaggregated reporting on the resource revenues (to allow for transparent accounting of the payments and expenditures of resource revenues) and transparent and robust projections of future revenues from the extraction of these resources.

Full disclosure of projected and actual resource revenues and how the revenues will be allocated reduces the risk of mismanagement of the revenues and improves confidence in the budget process. In fact, industry may be more willing to contribute more to the budgetary system (through taxes and royalties) and spend less on quasi-fiscal expenditures if they have confidence that the resource revenues will be managed soundly and invested in national and regional development priorities. Confidence in the budgeting process and the allocation of resources toward national development priorities may also increase the portion of aid that development partners allocate to general budget support.

4.1.1 Disaggregated reporting of resource revenues

The fiscal flows from natural resource extraction should be clearly identified, described, and disclosed in the budget documents²⁸²; these include not only royalties and taxes, but also interest earned on funds, quasi-fiscal expenditures by international companies, and incentives and deductions afforded to the

²⁸¹ IMF guide on Resource Revenue Transparency.

²⁸² Sachs, Jeffrey D. "How to Handle the Macroeconomics of Oil Wealth." *Escaping the Resource Curse*. New York: Columbia UP, 2007. Print.

industries.²⁸³ Reporting disaggregated fiscal flows is important for four main reasons: 1) the different forms of revenue flows have different degrees of volatility, risks, and macroeconomic implications, so their effects on macroeconomic models varies; 2) it allows for the identification of discrepancies more easily between company-reported payments and government revenues²⁸⁴; 3) it allows for specific earmarking of certain types of flows for certain purposes, if desirable; and 4) different divisions and directorates may be responsible for overseeing or auditing different aspects of the fiscal flows.

Currently, according to the IMF, the budget documents “allow for the identification of the Tax on Mining/Petroleum Production (Royalties) and Land Tax, and the earmarked and own revenues (*Taxas de Prestação de Serviços*) of the Mining Development Fund.²⁸⁵ However, the budget documents (proposal, law, etc.) do not make it possible to identify either the corporate income tax revenue from mining and hydrocarbon companies, or the funds obtained from mining concession revenues. Improving the disaggregated reporting of resource revenues should not be difficult for Mozambique, as the budget classification systems allows for the identification of revenues according to their source.

4.1.2 Modeling future revenue flows

To date, resource revenues in Mozambique have been quite modest, especially as some of the large extractive projects have only recently begun production, and others are still in the exploration stage. However, revenues are set to increase significantly as existing projects are expanded, companies exhaust the tax depreciation of their initial development costs, and additional mining and natural gas projects come online.²⁸⁶ For a country anticipating significant resource revenues, such as Mozambique, the medium- and long-term budgetary framework will depend to a large extent on the rate of exploitation of the natural resources, the fiscal terms of the contracts and laws, and the expected revenues (of all types) from the extraction. These factors should be considered alongside Mozambique’s overall fiscal and economic objectives over the medium and long term.²⁸⁷

Presently, the potential and anticipated resource revenues²⁸⁸ are neither estimated nor disclosed. However, Mozambique’s development planning, and especially the MTEF, could benefit tremendously (if not, instrumentally) by anticipating the revenue streams that are likely to come on line over the next decade, including forecasting their expected values, time horizons, risks, and volatilities.²⁸⁹ These

²⁸³ Governments should lift any confidentiality provisions in contracts or regulations that would impede reporting of resource revenue payments. IMF guide on Resource Revenue Transparency.

²⁸⁴ This is important in the near term for Mozambique, as the Mozambique EITI report recorded a discrepancy in revenues of over 50% of total payments by the extractive industries in 2008.

²⁸⁵ The Mining Development Fund is an autonomous State institution in charge of providing technical and financial assistance to the many Mozambican small-scale mines and artisanal workers in the mining sector.

²⁸⁶ Republic of Mozambique: Report on Observance of Standards and Codes— Fiscal Transparency Module. IMF Country Report 08/152. May 2008.

²⁸⁷ IMF guide on Resource Revenue Transparency.

²⁸⁸ Republic of Mozambique: Report on Observance of Standards and Codes— Fiscal Transparency Module. IMF Country Report 08/152. May 2008.

²⁸⁹ The United Nations Framework Classification (UNFC) for energy and mineral resources can be useful in this respect. The UNFC is a generally applicable system that classifies resources in terms of three criteria: economic and commercial viability (considers, e.g., market prices and relevant regulatory framework), field project status and feasibility (maturity of the studies, from exploration through extraction), and geological knowledge (level of confidence in geological knowledge and recoverability). Resources are then codified in a numerical system along these three indicators; 1.1.1 refers to resources that are commercially recoverable, have been justified by a feasibility study, and are based on reasonably assured geology. See <http://www.unece.org/ie/se/reserves.html>. In principle, the UNFC classification can provide a more uniform basis for both accounting and budget statements of reserves. IMF guide on Resource Revenue Transparency.

estimates and models should be publicly available, and regularly revisited and revised, given the frequency with which the assumptions (price, production costs, project size, etc.) change and the uncertainties surrounding each.²⁹⁰

Modeling Resource Revenues²⁹¹

The IMF has recommended several elements of a robust modeling of resource revenues necessary to underpin a medium-term fiscal framework, including:

- Specification of the fiscal regime (including any exemptions) applicable to each field or mine. In Mozambique, the transparency of the sector and the manageability of the funds could be improved with improvements to the fiscal regime. For instance, pre-production costs are calculated on a contract-by-contract basis, rather than specified and applied generally by law.²⁹² Some of these are addressed in Chapter 5 of this report.
- Detailed analysis of project-by-project production estimates, based on the technical production characteristics of each project (periodically checked against actual company production numbers). The operation costs of the extractive industries affect the profit declared, and therefore, the ultimate tax paid on the profit. Currently, in Mozambique, production costs are determined solely by the mining companies. The 2011 Mozambique EITI report recommends that the Ministry of Finance and the Ministry of Mineral Resources conduct studies to establish their own benchmarks for the cost of operation at the mines to verify the costs reported by companies (auditing is discussed at length in Chapter 5).
- Baseline price assumptions (acknowledging measurement difficulties, uncertainty over physical volumes and prices, and the lack of current standards even for advanced countries). The Mozambique EITI report recommended improvements in the current valuation method for the resources, such as addressing the issue of hedging in determining the value of minerals sold and a mechanism for confirming the quality provided by the mines.²⁹³
- A sensitivity analysis to show likely changes in asset worth as a result of changes in key parameters, such as baseline oil or mineral price.

Publishing this information will help the public understand the contribution of the sector to the government's budgetary resources, as well as the implications of the government's fiscal policies.^{294,295}

The MTEF (and underlying resource revenue model) should comprehensively address the various fiscal implications of the natural resource sector, meaning that in addition to revenue streams (taxes, royalties, bonuses), the model should also account for fiscal incentives, deductions, and other benefits that affect the revenue streams; quasi-fiscal activities of the companies (including corporate social responsibility projects, investments in infrastructure and human capital, and special development funds established); any equity ownership or participation in the projects of national resource companies; and other aspects of the resource extraction that implicate budgetary or extra-budgetary resources. Currently, these are not comprehensively calculated, published, or otherwise available in Mozambique.

²⁹⁰ Sachs, Jeffrey D. "How to Handle the Macroeconomics of Oil Wealth." *Escaping the Resource Curse*. New York: Columbia UP, 2007.

²⁹¹ Chapter 5 of this report discusses the usefulness of modeling resource revenues to evaluate the fiscal terms of the law and of contracts for extractive activities to ensure that the government gets a "good deal" for its resources.

²⁹² Mozambique EITI report.

²⁹³ Ibid.

²⁹⁴ IMF guide on Resource Revenue Transparency.

²⁹⁵ Mozambique EITI report.

Quasi-fiscal activities by resource companies are rarely incorporated explicitly in resource revenue models (or other budget documents or development plans) in resource-rich countries, but an explicit consideration of these fiscal implications of resource extraction would be beneficial for at least three budgeting and planning purposes. First, **several activities of resource companies, especially during the exploration phase of a project or social development activities, are cost recoverable or tax deductible, meaning that simply basing revenue flow projections for budgetary planning purposes on the fiscal code for mineral or hydrocarbon extraction will overlook these “costs” in forgone revenue.**²⁹⁶

Second, **several resource companies agree in their negotiations with governments to implement social development or infrastructure projects** (schools, clinics, roads, etc.) either as a condition for the concession or license, or in return for tax deductions. These are important both for the implications of the forgone taxes, but also, because these are extra-budgetary spending on social and infrastructure programs that complement the government’s budget for these activities. As a result, both companies and governments have an interest in the transparent and public accounting of these activities: “for governments, reporting on such quasi-fiscal activities demonstrates higher spending on development than is reported in the actual budget, and for companies, such public reports are evidence of corporate social responsibility and pro-development spending, in addition to taxes.”²⁹⁷

Third, **tracking these quasi-fiscal activities, including both the costs and results of fiscal incentives and company-funded development programs, is important to help inform future policies toward incentives and corporate social responsibility (CSR) projects.**²⁹⁸ Tracking the costs, outcomes, and quality of these investments can help governments assess whether the public sector, private sector, or a public-private partnership is best positioned to make certain investments. In addition to supporting the planning and budgeting process, this type of fiscal modeling of fiscal and quasi-fiscal investments of the extractive industry is necessary to design an appropriate fiscal regime and regulatory framework for such investments. This use of fiscal modeling is discussed in Chapter 5.

As of mid-2011, Mozambique does not have an established sovereign wealth fund or resource-revenue fund, though reports indicate that such a fund is under consideration. The pros and cons of such a fund are discussed more below. However, in the context of revenue forecasting and modeling, it should be mentioned that in the event a fund is established, the accounts and transactions of the fund should be incorporated into the overall model of resource revenue streams, and subsequently integrated into the MTEF, so that they are administered consistently with the government’s overall fiscal and expenditure policies and framework. Moreover, such funds ideally operate within the budgetary framework to ensure consistency with overall budgetary goals and to ensure efficiency, transparency, and accountability in the fund’s management and use.²⁹⁹

4.2 Improving the efficacy of donor and private-sector support

Mozambique’s development partners, the so-called Programme Aid Partners (PAPs), provide 50% of their overall support to Mozambique through general budgetary support. Nevertheless, despite substantial improvements over the past several years, there remains an opportunity for donors to improve the alignment of their support, both among the donors, and with the government’s own

²⁹⁶ IMF guide on Resource Revenue Transparency.

²⁹⁷ Ibid.

²⁹⁸ Ibid.

²⁹⁹ Ibid.

development processes and systems. **There are at least three major ways in which donors could support the government's planning process more effectively: increasing the transparency and predictability of donor allocations over a medium-term time horizon; coordinating donor support among the donors and around the government's identified priorities; and channeling more donor support through the government's own systems.** Moreover, private-sector development programs and activities should be aligned with government priorities and reflected in the MTEF, as well.

4.2.1 Transparency and predictability of donor support

As discussed above, the purpose of a robust and comprehensive MTEF is to help the government set priorities, determine activities and public investment plans to meet the development objectives, and then to allocate the available resources toward those activities and investments efficiently and transparently. It is therefore important that the MTEF account for all of the budgetary resources, including donor support, both on- and off-budget. MTEFs should allow the government to plan more than a year in advance, which is necessary for the design and successful implementation of almost all public investment strategies. **That means that, at the very least, there should be predictability about donor aid and commitments for the time horizon of the MTEF (3-5 years).** Lack of predictability about the resources available in the medium term makes such budgetary and development planning difficult.³⁰⁰

It has been pointed out that "donors' lack of capacity to provide credible medium-term estimates of their support to various areas of government intervention is ...contradictory ...[since] on one hand, donors insist on government putting together three-year spending projections, while on the other they are not able to do that themselves."³⁰¹ Aid flows have been estimated to be 40 times more volatile than tax revenues, making fiscal and expenditure planning especially complicated for aid-dependent countries. Moreover, the IMF suggests that a rising share of budget support, as has been the trend in Mozambique, "can aggravate aid volatility because of the inability of donors to make long-term commitments for budget support."³⁰²

In the near term, the MTEF could include contingency financing scenarios for the most critical sectors, in the event that donor disbursements are withheld or delayed. However, a more effective solution is for donors to make binding, reliable multi-year commitments, in line with MTEF priority sectors, to ensure predictable and reliable funding for public investments. In fact, international donors have pledged to provide more predictable and multi-year commitments, though these commitments have not been uniformly implemented.³⁰³ Currently, only DFID and Dutch Cooperation have *rolling* multi-annual budget support agreements³⁰⁴; most of the other donors have multi-annual agreements, but there is no predictability about whether and to what extent the agreements will be renewed.³⁰⁵

³⁰⁰ *Aid and Budget Transparency in Mozambique: Constraints for Civil Society, the Parliament and the Government*. Rep. May 2010. http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Aid_Budget_Transparency_in_Moz.pdf

³⁰¹ Paolo de Renzio, "Can Donors 'Buy' Better Governance: the political economy of budget reforms in Mozambique," *Cadernos IESE* N. 9, April 2011, p. 25.

³⁰² IMF, "Fiscal Policy Response to Scaled-Up Aid," June 5, 2007, p. 15

³⁰³ IMF, "Fiscal Policy Response to Scaled-Up Aid," June 5, 2007, p. 16.

³⁰⁴ DFID also has a 10-year commitment to finance the increased subsidies in the food program.

³⁰⁵ *Aid and Budget Transparency in Mozambique: Constraints for Civil Society, the Parliament and the Government*. Rep. May 2010. http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Aid_Budget_Transparency_in_Moz.pdf

4.2.2 Coordinating donor support among donors and with government priorities

One of the challenges of donor support in any developing country is that each donor is guided substantially by “headquarters,” meaning that they are constrained to a large extent by the priorities, procedures, and politics of their home governments. As a result, the in-country development partner representatives do not have the complete flexibility to adapt their support to the Mozambican Government’s changing needs and priorities nor to think creatively about untraditional forms of support. Moreover, the development partners do not always align their programs even with the other Programme Aid Partners. The World Bank recently noted that the “current ad hoc project-by-project approach in development partner financing has led to fragmented planning, volatile and uncertain financial flows, and duplicated efforts.”³⁰⁶

The donors have taken steps over the past several years to align their programmatic support with each other. For instance, in addition to the coordinated budget support, the donors have established several common funds, such as those for health (PROSAUDE II), agriculture (PROAGRI), budget reform, and support for the Administrative Court and rural water and sanitation programs, among others. These joint funds streamline the donor assistance to enhance the aid effectiveness in each sector, and many of them use national budget execution procedures and publish their commitments a year in advance, which are all positive steps.³⁰⁷ However, these common funds for directed sector support can also undermine government reporting and budgeting processes. In several cases, “planning, budgeting and reporting mechanisms were often set up [at the sector level] that were not synchronised or compatible with similar mechanisms in place at central level, or designed without taking into account ongoing central reform efforts.”³⁰⁸

Donor support for the sectors skews the incentives of the sectors to take seriously government planning, strategies, budgeting, and reporting procedures—both because processes at the sector level may be different and incompatible, and also because the direct funding for the sector depends on adhering to the sector-specific plans, budgets, and reporting guidelines. One source describes how the health sector prioritized its short- and medium-term sector strategies (which included mainly donor-funded activities) over the PARPA and PES, leading to policy incoherence.³⁰⁹ These sector strategies often reflect donor preferences for specific programs that may not be in line with national strategies; for instance, the global trend has been that donor support for certain infectious diseases (with high mortality rates) has increased substantially, while allocations for basic health proportionally declined.³¹⁰

Further steps could be taken to ensure that the development partners’ support is in line with and supports national strategies and reporting guidelines, and is coherent in the sectors in which there is not currently a common fund. In addition to improving the coherence of the donor programs among each other and with the government’s own plans, “coordinated action by development partners will also reduce the unit costs of increasing access, by achieving economies of scale in implementation.”³¹¹

³⁰⁶ V. Forester and C. Briceno-Garmendia, *Africa’s Infrastructure: A Time for Transformation*, 2010, World Bank and AFDB.

³⁰⁷ *Aid and Budget Transparency in Mozambique: Constraints for Civil Society, the Parliament and the Government*. Rep. May 2010. http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Aid_Budget_Transparency_in_Moz.pdf

³⁰⁸ Paolo de Renzio, “Can Donors ‘Buy’ Better Governance: the political economy of budget reforms in Mozambique,” *Cadernos IESE* N. 9, April 2011, p. 15.

³⁰⁹ Paolo de Renzio and José Sulemane, “Integrating Reporting of PRS and Budget Implementation: The Mozambican Case,” Discussion papers No. 38E, National Directorate of Studies and Policy Analysis, Ministry of Planning and Development, Republic of Mozambique, March 2007.

³¹⁰ IMF, “Fiscal Policy Response to Scaled-Up Aid,” June 5, 2007, p. 19.

³¹¹ V. Forester and C. Briceno-Garmendia, *Africa’s Infrastructure: A Time for Transformation*, 2010, World Bank and AFDB.

Until the systems evolve to be more compatible, the development partners can strategize with the government about how best to adapt the available means of support to the government's needs. **For instance, given that the government and the development partners recognize the need for technical assistance with both development planning and the implementation of development plans, the donors could support a planning and implementation workshop**, bringing in international expertise to support the process of development planning and the design of institutions and processes to improve the translation of the plans and priorities into actionable programs. **Improved planning and implementation capacity would benefit both the government and donors, who are trying to align their available support with the government's own plans and priorities.**

4.2.3 Channeling donor support through government systems

Although 50% of donor support to the government comes as budgetary support, that leaves half of all foreign aid that remains project support, and the majority of the project support is either not included in the annual budget or is included in the budget but with the funds managed by the donors.³¹²

Despite requests by the Ministry of Finance for donors to channel more project support through the Single Treasury Account (CUT), which would make the funds predictable for budgeting and planning purposes, one source estimated that only 5-10% of all project support by donors is currently channeled through the CUT.³¹³ The IMF's 2008 PEFA also concluded that: "What is needed is a system, through which the sectors inform the National Treasury Directorate (DNT) of the expected flow of the projects. This can only be done in an effective way by increasing pre-visibility of the external project disbursements and by increasing the use of the CUT."³¹⁴

In addition to facilitating planning, channeling aid through government systems can help to strengthen the government systems and to bring them in line with international best practices in public financial management. Moreover, using the country systems enables the government and civil society to monitor how the project support is being spent. When donors do not use government budgetary systems, reporting, procurement or auditing processes, it "makes it all but impossible for the government, parliament or civil society to monitor clearly how this money is being spent."³¹⁵

There is significant variation among the donors in terms of their use of Mozambique's budgetary systems. The United States, the largest donor to Mozambique in 2009, does not channel any of its support through the government's systems, and the African Development Bank, the World Bank, and Portugal also reportedly bypass the majority of the government's systems.³¹⁶ Some donors, such as the World Bank, require separate procurement and audit procedures from the government's own systems. Moreover, many donors, including for instance, the Global Fund to fight AIDS, Tuberculosis and Malaria, have distinct disbursement conditions, monitoring and reporting criteria, and financial execution procedures, creating additional levels of overlapping reports, inconsistent criteria for evaluation,

³¹² Ibid.

³¹³ *Aid and Budget Transparency in Mozambique: Constraints for Civil Society, the Parliament and the Government*. Rep. May 2010. http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Aid_Budget_Transparency_in_Moz.pdf

³¹⁴ IMF PEFA report, 2008.

³¹⁵ *Aid and Budget Transparency in Mozambique: Constraints for Civil Society, the Parliament and the Government*. Rep. May 2010. http://www.eurodad.org/uploadedFiles/Whats_New/Reports/Aid_Budget_Transparency_in_Moz.pdf

³¹⁶ Ibid.

unpredictability with respect to the flows, and many added layers of bureaucracy and administration.³¹⁷ In 2009, DFID hired a consultant to adapt the DFID systems to the government systems, in order to make them compatible and to maximize the use of the national management systems. This exercise could usefully be replicated or shared with other donors in similar situations.³¹⁸

Of course, **channeling project support through government systems is a mutual responsibility of both donors and the Government**, requiring respective commitments, transparency, and accountability for the management of the funds. As donors and the government build trust for the management of project support funds in the public systems, **donors should at least start to report on their aid and projects in a manner consistent with the budget classifications of the e-SISTAFE system, to enable integration in the MTEF even of off-budget projects.** Moreover, donors should distinguish between capital expenditures and recurrent expenditures to facilitate the government's medium-term planning.³¹⁹

In conclusion, improving public financial management (medium-term planning, strategic allocation of resources, proper use of budgeting and reporting tools, etc..) is integral to improving the efficiency of spending in Mozambique, shifting spending toward priority areas, reducing waste and misappropriation of funds, and realizing development outcomes.³²⁰ The "lack of transparency and coordination, a multiplicity of implementation and reporting mechanisms, and high levels of volatility and unpredictability" of donor support can all have a substantially negative impact on Mozambique's efforts to improve these integral planning and budgeting processes.³²¹

The group of development partners have all committed to improving the efficiency of their aid by adhering to the Paris Declaration on Aid Effectiveness (2005) and to the Accra Agenda for Action (2008). Steps have been taken to improve information about the aid flows, including the quantity, the projects and the results, such as through an online database (ODAMOZ, www.odamoz.org.mz), where donors record their commitments and expenditures on individual projects. Reportedly, however, there is room for improving the data entry on ODAMOZ to ensure that the information is accurate, and more importantly, to connect ODAMOZ to the government's own financial management system, e-SISTAFE.³²²

4.2.4 Private-sector development activities

Several major investors in Mozambique, including in the Zambezi Valley, have committed substantial resources to community and regional development, including infrastructure investments (roads, schools, clinics), training programs (for SMEs and vocational schools), agricultural development, environmental programs, and the like. In some cases, the specific projects are agreed upon with specific government officials or government agencies, either during negotiations or in the investment contract. Rarely, however, is the investor familiar with the government's medium-term development priorities, public investment program, or sector-specific strategies, and private-sector development programs are never reflected in the MTEF. As a result, the private-sector programs are developed in parallel to existing initiatives rather than developing programs that supplement and bolster existing programs and initiatives, and allow the government to plan complementary public investments.

³¹⁷ Ibid.

³¹⁸ Ibid.

³¹⁹ IMF, "Fiscal Policy Response to Scaled-Up Aid: Strengthening Public Financial Management," June 5, 2007, p. 17.

³²⁰ IMF, "Fiscal Policy Response to Scaled-Up Aid," June 5, 2007, p. 4.

³²¹ Paolo de Renzio, "Can Donors 'Buy' Better Governance: the political economy of budget reforms in Mozambique," *Cadernos IESE* N. 9, April 2011, p. 37.

³²² Ibid.

Coordination of private-sector activities and development priorities could be done at the municipal or provincial level (for instance, in cases of mining companies catering to the specific development needs of a local community) or at a national level (in the case of planning large infrastructure investments or establishing development funds, such as the fund established by Vale for regional development projects). Many of the tools suggested throughout this report would help the private sector align its investments and activities with those of the government, such as joining business alliances (Chapter 1), supporting the creation of an aspirational infrastructure map (Chapter 2), committing to cumulative environmental risk management programs (Chapter 3), and coordinating with an inter-ministerial committee tasked with overseeing the public investment program (Chapter 4), among others. Streamlining the planning documents and strategies, harmonizing monitoring and evaluation tools and reporting guidelines, and facilitating discussion about national priorities, such as through the National Observatories, would all help the alignment of public and private activities as well.

There are a number of benefits for the private sector in ensuring that their programs are in line with regional or national development priorities: the company could attract additional funding (public, NGO, or donor) or in-kind support (such as publicly trained teachers for new schools) to leverage the company's own investments, increasing the size and impact of the project; the company can use existing metrics and reporting tools and systems to measure and report on results, rather than developing parallel tools; the continuity of the project past the investment lifecycle is more likely if the program is already a government priority; and there is a greater likelihood that the program will have a meaningful impact if the project has been identified as a regional or national priority.

5. Strategy for resource revenue allocation

One of the most critical policy decisions for governments of resource-rich countries is how to allocate the resource revenues. It is important to remember that resource revenues can raise a country's GDP without having any development impact. In order to ensure that the revenues benefit the country, in addition to adding to GDP, a national strategy should ensure that the revenues are managed transparently, that the benefits are shared among the population, and that the resources are strategically invested accordingly, in line with the PARP priorities and MTEF expenditure lines.

Companies, too, have an interest in ensuring that their payments to the government are translated into development benefits for the local and national communities that are impacted by the investment (and who therefore expect development benefits from the presence of the company), and that the citizens affected by the investment (both locally and nationally) can track the benefits of the company's payments through strategic public investments. Articulating a plan for the transparent use of the resource revenues in line with development objectives will therefore build trust both with the companies and communities, and will create a platform for a more operational discussion about how the benefits and responsibilities of the extractive activities will be shared among the stakeholders.

There are a number of (sometimes competing) priorities facing policymakers in determining how revenues should be allocated: 1) the population of the host country should benefit from the extraction of resources owned by the state, either directly or as beneficiaries of a public investment program; 2) since resource prices and markets are highly volatile, revenues from extraction should be used to smooth consumption and ensure fiscal stability in the short and long terms; and 3) since the resources are non-renewable, the benefits of resource extraction should extend to future generations.

Legal and institutional frameworks for the allocation and use of resource revenues vary significantly among countries. In some countries, revenue streams are collected in the central treasury account and are administered as any other form of revenue. In other cases, either a portion or all of the revenue streams are managed separately; either allocated back to the region of production, transferred to the population in the form of cash transfers, or managed separately in a resource fund.³²³ One could imagine that decisions about the optimal allocation and management of revenues will depend on the local impacts of the extractive activities, the capacity of the sub-national governments, the extent to which the budgeting process is decentralized, and the levels of poverty and the wealth disparities among the population, among other factors.

Resource revenues can be allocated either through the general budget (in the case of a robust budget that was in line with the development priorities), through a transparent, earmarked budgeting process, or through the creation of funds that are specifically targeted for key public-sector investments. Earmarking resource revenues has been more successful in some cases than in others. In Chad, the World Bank supported a petroleum revenue management law that specifically earmarked petroleum revenues for investments in health, education, and other sectors. However, shortly after the law was passed, parliament controversially changed it, increasing access to the revenues for discretionary use. In Botswana, however, mineral revenues have been consistently reinvested in infrastructure and human capital development in accordance with the Government's National Development Plans, and is widely considered an example of successful resource management. And in Timor-Leste, in 2010, the Government created two funds, an Infrastructure Fund and a Human Capital Fund, to specifically earmark funds from the Petroleum Fund for strategic public investments in line with development priorities.

Ultimately, the strategy for managing and allocating the resources should both reflect the priorities of the development plans and, in turn, be reflected and incorporated into the development plans and MTEF as well. Moreover, **now is the best time for Mozambique to consider its strategy for managing and allocating resource revenues, since current revenue streams are still small**; stakeholders can have a genuine discussion about the optimal management and allocation strategy with less political pressure than often exists when revenue flows are high.

6. Monitoring and supporting the national development planning process

One of the greatest criticisms of either market-led or government-led development, from both ends of the spectrum, is that personal and institutional interests, limited institutional capacity, and the complexity of the development challenge mean that even well-articulated policies (corporate or public) do not necessarily translate to positive outcomes. In the worst case, of course, systemic corruption (or even the corruption of a few leaders) undermines any well-designed law, policy, or national development plan. Short-term interests and personal gain trump national development opportunities or visions. Even in the absence of corruption or fiscal mismanagement, effective national planning and revenue management can be undermined by the complexity of the processes, the multiple players involved in public financial management (including tax collection, revenue management, budgeting, and spending), poor data accessibility and reliability, the lack of coordination within a cabinet or between

³²³ "Using non-renewable resource revenues for sustainable local development," *Sustainable Development Innovation Brief*, Issue 6, United Nations, Oct 2008.

the cabinet and other stakeholders (including the private sector, civil society and development partners), the lack of transparency over key documents and processes, and other challenges.³²⁴

Any effective allocation of resource revenues requires transparency and accountability mechanisms to allow the public to track the resource spending and monitor its contribution to development. If the necessary information is transparent and available, local and international civil society organizations can play an instrumental role in assuring integrity of the processes and data. One of the most assured mechanisms for ensuring transparency would be to create a “Transparency Portal,” akin to the portal recently established by Timor-Leste (see box), to centralize information about the government’s budget processes and execution.

Timor-Leste’s Transparency Portal

In March 2011, Timor-Leste’s government announced a Transparency Portal, allowing its citizens and the broader international community to monitor public expenditure online, with information updated daily. Specifically, the Transparency Portal allows users to see “how the budget is being executed, what is being spent in each Ministry, Department and Directorate and on what category of items.” In announcing the Portal, Prime Minister Xanana Gusmao said that “[f]or a Government that is committed to broad development throughout the country, it is important that the public has access to this information,” and he noted the particular importance of this transparency given the recently established Infrastructure Fund and Human Capacity Development Fund, through which the government plans to channel resource revenues toward strategic investments. Prime Minister Gusmao called on “all Timorese to be involved in the very operation of public administration and, in as much as possible, participate in Government decision making.”

There are some international initiatives that allow for the population and civil society to track the *spending* of the resource revenues. The International Budget Project (IBP), for instance, has worked since 1997 to promote budget transparency and accountability in low- and middle-income countries. The IBP produces an Open Budget Index (OBI) to monitor and measure the comprehensiveness and accessibility of the information provided about the central government’s budget and financial activities. Mozambique scored quite low on the Index in 2010 (earning a 28 out of 100), indicating that the government provides minimal information to the public on the central government’s budget and financial activities during the year.³²⁵ However, Eneas da Conceicao Comiche, former Finance Minister and current head of the Plan and Budget Commission of the Mozambican parliament, noted that the wording of the survey is not as applicable in Mozambique, and that some of the “missing” documents for which Mozambique received a low score in fact do exist but are called by different names. Others have backed his criticism of the OBI in the Mozambican context as well.³²⁶ In any event, there is certainly room for improvement in budget transparency in Mozambique, in part because much of the information that should be made public is still not systematically analyzed or produced in Mozambique. It should be noted that **budget transparency can also benefit countries financially, since countries with transparent budgets and budgeting processes often have better access to international financial markets and to low-cost loans.**

Other well-established multi-stakeholder initiatives and transparency mechanisms, discussed more

³²⁴ De Ferranti et. al., *Enhancing Development through Better Use of Public Resources: How Independent Watchdog Groups Can Help*. 157. Brookings Institution, Sep 2006. 2. Print. Policy Brief Ser.

³²⁵ Open Budget Survey 2010- Mozambique.

³²⁶ “Mozambique Budget Transparency: Are the Wrong Questions Asked?” 26 Oct. 2010. Web.

extensively in Chapter 5, focus on the revenue *collection* process, including through EITI, Publish What You Pay and some home-grown oversight commissions that monitor and publicize the payments of governments and the revenues of governments. There has been some discussion among these multilateral stakeholder groups, including EITI++ and the Public What You Pay networks to track the spending of governments on a regional or international basis through a “Publish what you spend” initiative, though no mechanism has yet materialized. The EITI initiative was initially established “to improve upon development outcomes from payments made by Extractive Industries to governments.”³²⁷ There are several ways, therefore, in which MEITI could be enhanced to meet that goal. First and foremost, the MEITI report could go beyond simply tracking the payments and revenues, and address the allocation of the resource revenues. In the best case, the report would “track the spending” through the budgetary processes, to enable monitoring and auditing of the development spending. MEITI could also report on community and infrastructure expenditures by the private sector, as discussed in Chapter 5. In the short term, the MEITI could at least publish and disseminate the national strategy for the use of the resource revenues, so that there is clarity among the stakeholders, including local populations and companies, about how the resource revenues are being allocated for development purposes.

In Mozambique, there are a number of initiatives to oversee the planning and budgeting processes. Particularly noteworthy initiatives include the national and provincial Observatories, a consultative forum where the range of stakeholders (civil society, donors, private sector and government) discuss policy priorities. There are some noteworthy civil society groups that actively participate in the policy dialogue, including the Mozambique Debt Group (GMD), the Center for Public Integrity (CPI), and the Community Development Foundation (FDC). In March 2011, CPI began to publish 2010 public expenditure reports for 15 districts in five provinces, under its Budget Monitoring, Expense Tracking and Social Audit Program, which seeks to increase budget transparency and the effectiveness of public expenditure in Mozambique.³²⁸ Further private-sector and donor support for these organizations could significantly improve their capacity to promote transparency and to participate in the government’s development process by overseeing and participating in decisions about budgeting, prioritization, and resource revenue allocations.

³²⁷ Mozambique EITI report.

³²⁸ <http://www.cip.org.mz/index.asp?sub=moc>

7. Conclusion and summary of recommendations

Recommendation	Main Features	Led by	Stakeholders	Technical Assistance
Planning for resource-based development	<p>Medium-term development plans should include resource-based infrastructure, linkages, revenue management, domestic resource needs, and cumulative environmental risks</p> <p>Creating an inter-ministerial commission 1) to supervise the PIP, 2) to oversee statistical analysis, 3) to ensure consistency of planning tool, 4) to begin streamlining various development plans</p>	MPD	Other Ministries, Development Partners, Provincial Governments	Development Partners
Aligning and operationalizing key objectives, priorities and actions of development plans	<p>Streamlining central and sector planning documents to focus on priority issues in line with MDG targets</p> <p>Creating an institutional framework for engaging line ministries, donors, and private sector</p> <p>Designing a PIP to identify and cost strategic public investment projects and align with financing options</p> <p>Streamlining M&E indicators and processes, reducing redundant reporting and administration, and increasing rigor of statistical analysis.</p> <p>Convening a planning workshop for MPD and line ministries</p>	MPD, Min. of Finance	Other Ministries, Development Partners, Provincial Governments, Private Sector	Development Partners
Preparing a robust MTEF	<p>Reconciling the budget process with the MTEF</p> <p>Aligning and costing key development priorities (such as the PIP) in the MTEF</p> <p>Modeling available resources (tax and other revenues, donor support, extra-budgetary funds and quasi-fiscal activities, such as private-sector expenditures)</p>	MPD, Min. of Finance	Other Ministries, Development Partners, Provincial Governments	IMF, WB
Improving efficacy of donor support and private-sector development activities	<p>Increasing the transparency and predictability of donor allocations over MTEF time horizon</p> <p>Coordinating donor support among the donors and around the government's identified priorities</p> <p>Channeling more donor support through the government's own systems and reporting all according to budget classification</p> <p>Aligning private-sector development activities with government's priorities and systems</p>	MPD	Other Ministries, Development Partners, Private Sector	Development Partners
Monitoring the national development planning process	<p>Improving Budget Transparency (such as through enhanced MEITI)</p> <p>Supporting civil society and private-sector engagement in planning and monitoring processes</p>	MPD, Min. of Finance	MEITI, Debt Group, FDC, CPI	Development Partners, Private Sector

Chapter Five: A Transparent and Mutually Beneficial Legal Framework for Extractive Industries

Introduction

A predictable, durable, and equitable legal framework, implemented by strong government, corporate, and societal institutions, is the foundation of a mutually beneficial mining sector. When the rules for company, government, and citizens are widely known, investments can operate smoothly, governments can manage them effectively, and citizens can monitor how the benefits of the investment—fiscal and non-fiscal—are allocated. A transparent, mutually beneficial legal framework will not prevent exogenous shocks and other potentially negative effects like accidents, but it facilitates mitigation and adaptation. Since these are long-term and multi-faceted relationships, a balanced and transparent contractual and fiscal relationship will underpin an efficient and fair sharing of the resource wealth, both between the company and the government, and between the government and its citizens.

In addition to jobs, capital, infrastructure, and technology, as discussed in Chapter 2, Mozambique's natural resources can and should generate substantial fiscal revenues for the government. **Mineral revenues could provide a significant expansion of the state budget, which needs funds to provide essential public services to the country and end extreme poverty**, as described in Chapters 4 and 1, respectively. Since the resources are nonrenewable, the importance of ensuring that their extraction translates into revenues and public investments in development is especially great.

There is currently a vibrant dialogue in Mozambique about the future of the country and how the new mining boom can contribute to accelerated growth for the country and the larger SADC region. There is broad recognition that the country is at a pivotal moment. Several megaprojects have been active for several years, such as Mozal and Sasol. A small number of mining companies are in production, and most are scheduled to come into production in 2011, including Vale and Rio Tinto/Riversdale. Other companies have signed concession agreements and will be moving to production in the coming years. Numerous exploration activities are proceeding in the country, as well.

Reflecting on the mechanisms to ensure maximum benefit of the extractive sector for all stakeholders is particularly relevant for Mozambique at this moment: **the Ministry of Mineral Resources (MIREM) is currently reviewing the country's mining laws and model mining contract**. This is an opportunity to learn from past experience in Mozambique, as well as comparative international experiences, to implement innovative solutions for the future. For instance, there are currently gaps in the fiscal regime that could be addressed through revisions such as implementing a resource rent tax (RRT) to capture windfall profits and implementing capital gains taxes to capture the benefit of the sale of mineral deposits from one company to another. These are discussed in more depth below.

Amid this review by MIREM, there are currently calls by some members of society and government to update contracts in several sectors, including mining, in order to ensure mutual long-term gains on both sides. Financial modeling of existing contracts would ground the discussion about updating the contracts in a deeper understanding of the costs and benefits of mineral fiscal policy. **For the mining sector, contract disclosure and open discussion about the costs and benefits of current contracts, as well as anticipated benefits of future contracts, are centrally important.**

The focus of this chapter is on the regulatory and fiscal regime for the mining sector. Not every law that is of great importance to the sector is discussed. Health, safety, labor, human rights, and land rights are all areas that require legislation and robust institutions to ensure that communities benefit from mining activities.³²⁹ Mining companies need general commercial laws like banking, property, contract, investment, and taxation to operate smoothly. Environmental laws and regulations are addressed briefly, though not comprehensively, in Chapter 3. These, and many other laws and regulations, while not discussed in this chapter, are integrally important for ensuring the mutual benefits of the extractive industries to the public and private sectors and to local communities.

Given the central importance of the fiscal benefits from the mining sector and the current revisions of the mining law and model contract, the focus of the first part of this chapter is on some of the most pressing reforms the country might consider during this process. The second part of the chapter focuses on how to ensure that money owed to the government is actually received. Financial auditing and enhancing the EITI process to monitor the fiscal benefits more completely would ensure that tax-dodging, poor accounting, or simple mistakes do not result in great financial loss to Mozambique.

1. Revising the model contract and mining law

Mozambique's plan to revise the mining code and model contract present an opportunity to implement a fiscal framework, reflective of Mozambique's current investment climate, which ensures that the benefits of the extractive industries are shared among companies, communities, and the national population. While revising laws and contracts too often creates uncertainty, when done carefully and with a view towards long-term partnerships, a new legal framework that furthers the goals of the country and its partners is more durable and can be a source of stability. This can improve investor trust, allow for better enforcement of the law by government, and maximize the benefits of the industry for the citizens.

When a country undertakes such a process, several critical questions arise: What would be a fair deal in the current market? What should go in the law versus the contract? And what should be done with the contracts that have already been signed? Can they be brought into the new system without undermining the country's investment environment? These questions are the subject of this section.

1.1 Achieving a fair deal: the importance of financial modeling

Financial revenues are one of the most important benefits a country receives for the extraction of its non-renewable natural resources. A deal that is equitable for both the country and investors will be more durable than those that are too generous to either side. A push to update the contracts will come from the investors or the citizens if deals are, or are perceived to be, too asymmetrical. Independent financial modeling of revenues is critical for determining what a fair deal might be. MIREM has financial

³²⁹ For example, regulations concerning the resettlement of communities are also not addressed in this chapter. Without governing regulations, resettlements have reportedly been handled through bilateral negotiations. There are international norms governing resettlement processes, and these norms should be enshrined in national legislation to ensure that these basic standards cannot be subject to negotiation; these include norms relating to free prior and informed consent, the process of resettlement, and minimum guarantees for replacement of property, among others. Everyone who spoke to us for this report about resettlement was interested in clarifying the governing legal framework.

models provided by the companies; thoroughly vetting these and sharing them with the public is vital for public trust and management of the sector.

Knowing what constitutes a fair deal is, however, an enormously difficult task. First, “the deal” is in fact an imprecise term. A “\$2 billion dollar deal” reported in the media or announced by government and company officials could represent any number of calculations or estimates—how much the company plans to invest, what total returns of the project are estimated to be, or what the government is estimated to receive, among others. The “deal” also depends on the price of the commodity, capital and operational costs (which includes transportation costs, financial costs, labor, the prices of consumables that are necessary to ship the project’s commodity to market), and other variables that will change over time, making any such number an estimate. Different assumptions about these variables can change the profitability of the mine for the investor, and in turn, how much the government will receive. What the government will receive is called the “government take” in mineral taxation literature.

Government Take is the total share of revenue that a host government receives from the extraction of oil, gas, or mining resources. This share can include taxes, royalties and government equity shares, or other alternative taxation instruments, like resource rent taxes or production share of the resource, according to those in place in a given country. (See Figure 5 for an illustration of this calculation for a hypothetical coal mine). The Effective Tax Rate is used as a proxy to estimate the government take.

Effective Tax Rate (ETR) is defined as the undiscounted value of all amounts paid to the government, divided by the undiscounted value of the before-tax cash flow of the project.

Internal Rate of Return (IRR) is the discount rate that makes the net present value (NPV) of all cash flows (both positive and negative) from a particular investment equal to zero. It is used to measure and compare the profitability of investments; a project is undertaken if the project’s IRR is greater than the cost of capital. An investor’s IRR of a given project can also be calculated.

Determining a ‘fair deal’ requires an estimate of the government take, as well as the project’s IRR and a comparison with other similar projects (discussed more below). Financial modeling can be used to estimate the government take and IRR under various assumptions; such a model can be instrumental in determining desirable terms for new legislation and for model contracts to ensure that the government take is fair.

Non-fiscal benefits like infrastructure, schools, linkages, and training programs are not captured in the government take.³³⁰ These benefits can be significant and need to be considered when assessing the benefits of a project, but quantifying and calculating these benefits can be challenging. Other fees from ancillary infrastructure could also provide a separate revenue stream for the country. For example, Botswana’s Selbi-Pikwe nickel-copper mine has been described as “sub-economic” and “rarely paid any tax or royalties (royalties were calculated on operating profits, not sales) and is said to have been a “springboard for development, paying for critical parts of the national infrastructure through user fees.”³³¹

³³⁰ Otto, James et al, Mining Royalties: A Global Study of their Impact on Investors, Government, and Civil Society (2006). However, to the extent that these non-fiscal benefits are tax-deductible, they are included in the calculation of the government take.

³³¹ Hartley, Julian and James Otto, “Managing Mineral Resources: From Curse to Blessing.” On file with authors.

The optimal mix of fiscal benefits from the resource, ancillary infrastructure, and non-fiscal benefits is an important policy decision that relies on difficult calculations. Financial models are critical to getting a clearer picture of the fiscal and non-fiscal benefits accruing to the country from the resources. In addition, when there is more dialogue among citizens, governments, and companies, these complex decisions are more durable in the long run; without it, countries may feel the constant political pressure to change the legal framework, causing cost and confusion for all stakeholders.

1.1.1 The main elements of government take: royalties and taxes

In mining, royalty and tax systems prevail as the predominant method for governments to receive fiscal benefits. Royalties and taxes are at the “heart of the deal” and represent the largest cash streams for most governments, although other streams like import/export duties, value-added tax (VAT), and signature bonuses exist as well.

A royalty is generally favored by governments because they are payable irrespective of whether the mine is making a profit or losing money. It represents a payment for a non-renewable resource that has value, even if the company extracting the mineral is not making a profit from it. Taxes, on the other hand, are levied on profits, so they will accrue to the government only when the company is making a profit from the mine.³³² Though not universally true, royalties and taxes are generally set in law, as encouraged by the minerals literature. Mozambique has already done this in its minerals fiscal legislation.

The general view is that unless a government urgently needs revenues in the near term, it is better off in the long run obtaining the majority of its share of production or revenues (or rent) with back-end-loaded elements like taxes or government participation (i.e. equity shares). However, there is no one-size-fits-all answer; it all depends on what society seeks in return for its resources. And, this may change over time, too. With several large contracts soon coming into production under regressive royalty/tax regimes in Mozambique, **now is the time to consider adding an additional progressive fiscal mechanism to capture more financial benefit, but on a longer time-horizon in future contracts.**

Progressive system: as the profitability of resource exploitation increases, there is a progressive increase in the government take. The profitability increases once the fixed costs incurred at the beginning of the project are all recovered and only the operating and other variable costs remain.³³³ The higher the prices, the shorter the investment recovery or payback period is. This tax system allows flexibility to extract the different rents actually generated by deposits under dynamic price and costs conditions.

Regressive system: the inverse of a progressive system, i.e., as the profitability of resource exploitation increases, the government take is stable or actually declines.

Fiscal mechanisms like bonuses and royalties³³⁴ will ensure that some of the government take comes earlier in the life of the project. However, the government is likely to end up with less in total if the

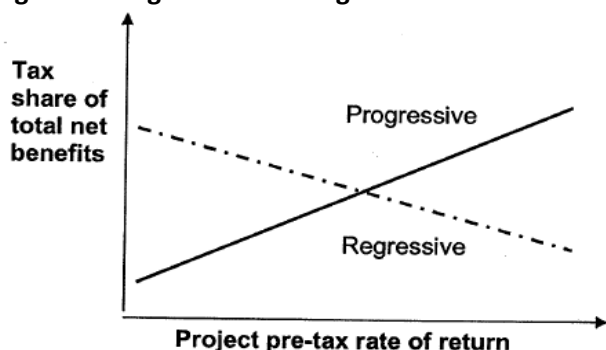
³³² This is an introductory explanation of mineral taxation concepts; not all royalties or taxes function as described in this text.

³³³ Operating and other variable costs are typically low compared to revenues.

³³⁴ These fiscal mechanisms are commonly referred to as regressive in the fiscal literature. Regressive taxation instruments are generally those where the government does not receive as much of the upside benefit when profits are higher.

system is too heavily front-end-loaded with these forms of revenue streams.³³⁵ Regressive elements also keep the country from benefitting from higher profits, as demonstrated in the Figure 4.

Figure 4. Progressive and Regressive Taxation³³⁶

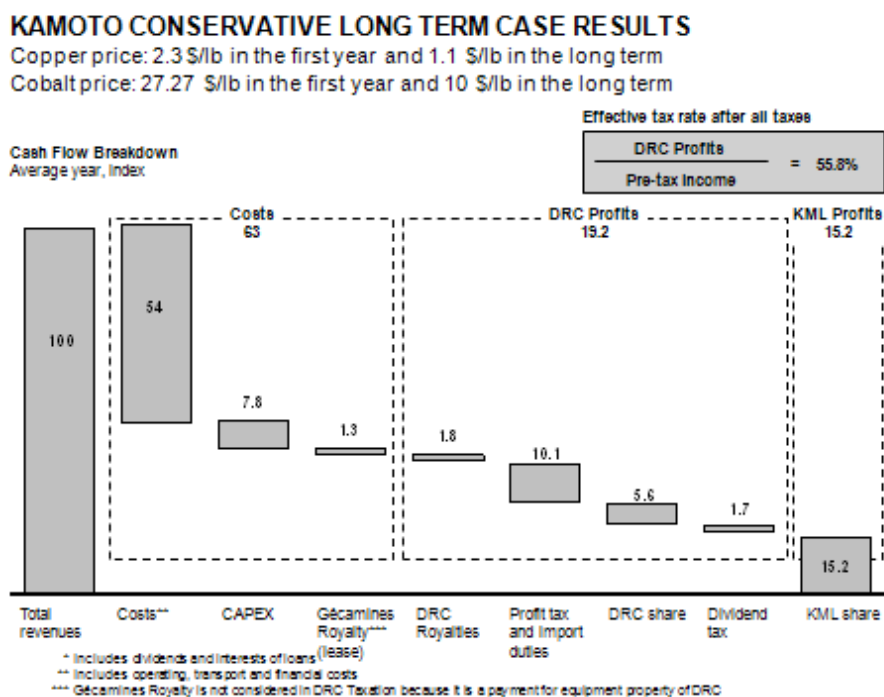


Under regressive systems, countries do not benefit as much when prices are higher or costs are much lower. This result led many governments to seek renegotiation during the boom in commodity prices in 2007-2008 and has led to renewed interest in progressive taxation mechanisms. These mechanisms are discussed further below, in the specific context of MIREM’s work to update the mining law and model contract; the current fiscal package in Mozambique is regressive and could be made more progressive.

1.1.2 Illustration of fiscal regime through a model of a copper mine

Figure 5 shows an example of a financial model, in this case of Kamoto copper mine in the Democratic Republic of the Congo (DRC), illustrating how a model can be used to calculate the government take of a particular project. This model was prepared by Columbia University in 2007. Inputs into the model include publicly available information about long and short term copper and cobalt prices; the relevant taxes from the DRC’s fiscal regime; specific production values; capital expenditures (CAPEX) and operating costs; and other terms agreed in the contract. Moreover, a number of other factors could affect the government take and IRR, such as the quality of the ore and the processes needed to extract it.

Figure 5. Estimate of the government take of Kamoto copper mine in DRC



³³⁵ Israel Hydrocarbon Fiscal Analysis and Commentary 15 November, 2010, Daniel Johnston.

³³⁶ Land, Bryan, “Resource rent taxes: a re-appraisal” in *The Taxation of Petroleum and Minerals: Principles, Problems, and Practice* IMF (2010) at Appendix I, p. 259.

Based on the assumptions in this model, the government take was estimated to be around 56%; the underlying model also showed an unusually high internal rate of return of the project of 64%. In addition to the assumptions described above, Government take may also be affected by confidential tax benefits arranged between the parties, or transfer pricing (see box below)

Designing a similar model for Mozambique’s mines would require access to actual project numbers and variables and contract terms, including any agreed tax breaks, which are currently confidential.

Transfer pricing refers to transactions among related/affiliated companies for goods, services, or the use of property. The OECD Transfer Pricing Guidelines state, “Transfer prices are significant for both taxpayers and tax administrations because they determine in large part the income and expenses, and therefore taxable profits, of associated enterprises in different tax jurisdictions.”³³⁷

Transfer pricing can result in losses to a country if not monitored carefully. Costs, prices, and other charges may not be at “arms-length,” as they would be among independent enterprises.³³⁸ Examples include: debt financing provided by related parties at above-market rates; above-market fees for technical services, consulting, or intellectual property charged between related parties; and the sale of minerals at lower-than-market value to low tax jurisdictions. Since global mining companies often run vertically integrated operations that rely on multiple related corporate entities, there are many transactions in which transfer-pricing could occur.

In Mozambique, there is a law on transfer pricing, but it has been described by accountants in Maputo as “extremely short and weak.” A recent report calculated potential losses due to transfer pricing as at least \$23.48 million in lost revenues for Mozambique between 2005 and 2007, though this was not a minerals-specific calculation.³³⁹

In general, a complete financial model requires information about the relevant laws, actual project numbers and contract terms. However, the fairness of a fiscal regime is best assessed relative to a group of peer countries, as discussed in the next section.

1.1.3 Methodology for a rigorous assessment of fiscal regimes

Government take, in itself, is not enough to assess the fairness of a deal. It is useful only to the extent that it allows comparison with a peer country group that presents similar risk and potential and where companies have similar profitability. For the purpose of comparison, the government take does not address timing and the time value of money, which varies among countries. Depending on the development needs of a country, front-loaded revenues may be necessary for critical public investment, whereas other governments may prefer more continuous flows over time. Other considerations, such as the political economy, may affect the time value of revenues flows as well.

The government take indicator allows a country to see if its position in this group is close to the average or far off. Too far off in one way or the other is detrimental for the government and the company. If

³³⁷ Organization for Economic Co-operation and Development Transfer Pricing Guidelines, <http://browse.oecdbookshop.org/oecd/pdfs/browseit/2309111E.PDF>.

³³⁸ The arms-length principle was developed by OECD Transfer Pricing Guidelines to guide how transactions should be priced among related units of a multinational enterprise.

³³⁹ McCaughey, Sorley. *Tax of Life: How Tax Dodging Undermines Irish Support to Poor Nations*. Christian Aid (May 2010).

the government take is far below average, there will likely be a push to renegotiate the contract, and if the government take is far above average, it risks losing future investment in its mining sector or abandonment of a project that is underway. The government take is only a tool to compare the *fiscal* benefits of one project to another, not a comprehensive indicator of all benefits nor a tool to compare non-fiscal benefits among projects.

As an example, a study that was published in Israel in January 2011 that led to a reform of Israel’s fiscal regime and the renegotiation of the gas contracts based its argument precisely on low government take relative to its peer group (see box).³⁴⁰

A rigorous approach to assessing the fairness of a fiscal regime

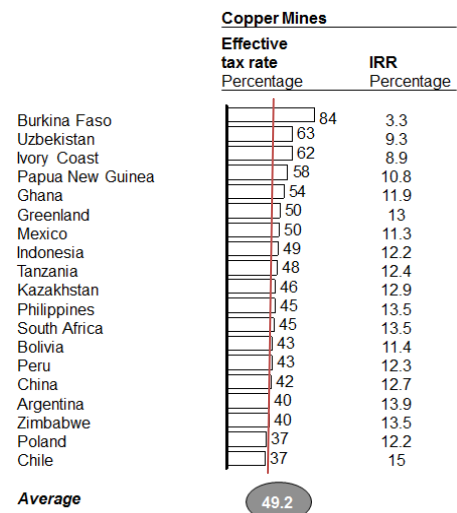
An Israeli Commission in charge of assessing the fiscal regime defined its peer group as follows: 1) gas prone, (2) deepwater, (3) somewhat risky beyond ordinary geological risk, (4) relatively remote with respect to logistical centers, and (5) experienced with respect to the international market for exploration acreage and projects. The commission then assessed that the government’s take has been, since 1952, at 30% whereas the average of the peer group is around 65%.³⁴¹

Mozambique’s peer group of countries would be:

- Rich in coking coal
- Open-pit mining
- Aged or absent infrastructure in need of rehabilitation and upgrading or Greenfield development of this infrastructure
- Weak business-enabling environment

To date, no known study has produced a benchmarking of the government take and IRR of coal mining in various countries, which would usefully allow Mozambique to assess its fiscal regime relative to its peer group. For copper mining, James Otto and the Colorado School of Mines carried out such a benchmarking in select countries.³⁴² Otto et al used a standardized copper mine model and applied all applicable royalties/taxes for each country in that model to compare the outcomes. (See Figure 6)

Figure 6. IRR and ETR for a Model Copper Mine in Selected Countries (Source: James Otto, 2006)



They obtained an average government take (estimated by the ETR) of 49.2% for an IRR that are all below or equal to 15%. Since then, these averages have been used as a rough benchmark to assess the fairness of copper mining contracts. This benchmarking suggests that if a copper mine in a specific country yields a government take of significantly less than 49% for an IRR of 15% or more, then the country’s governing fiscal regime is below the world average; in such a case, the mine is sufficiently profitable for an updated tax policy that would align government take with the international average and ensure that the profits of the mine are shared over the long-term. Recall that the DRC Kamoto mine model yielded a 56% government take (ETR), which would indicate an above average take. However, the IRR for the Kamoto mine (64%) far exceeded the range of what is considered a normal rate of return (12-15%) by the

³⁴⁰ Carried out by Professor Eytan Sheshinski, Hebrew University, Jerusalem, Israel

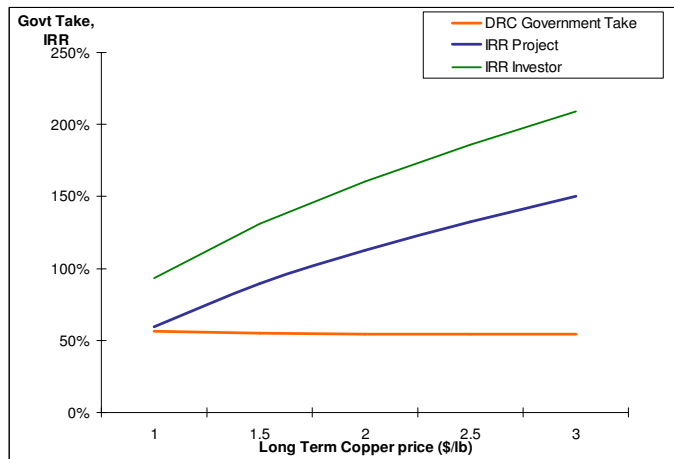
³⁴¹ Daniel Johnston, Israel Hydrocarbon Fiscal Analysis and Commentary, 15 November, 2010.

³⁴² James Otto et al., *Mining Royalties, A global study on their impact on investors, government and civil society*, WB, 2006.

industry; this suggests that the company is collecting a “rent.” Rents are excess profits over the minimum rate of return which is required to justify investment. Taxing this rent increases the government take (See section 1.2.1).

Importantly, government take, while a useful indicator, also does not indicate how progressive or regressive a fiscal regime is. **For instance, the model of DRC’s Kamoto copper mine above shows that the government take does not increase in periods of very high profitability,** such as when world prices surge beyond expected price levels. Graphing the government take over time, along with the project and investor’s IRRs, can illustrate the progressivity of the regime. For instance, figure 7 shows that the project’s IRR and investor’s IRR rise considerably with price increases while the government take tends to decrease, reflecting a regressive regime.

Figure 7. Financial model illustration – Impact of different long-term copper price scenarios on project, investor’s internal rate of return and government take



1.2 The difficult dilemma: law or contract?

If the financial modeling exercise justifies increasing the government take or adding progressivity into the fiscal regime, where might such new taxes go: the revised law or model contract? And what other aspects should be changed and where?

Countries around the world have varying practices on the degree to which fiscal benefits and regulation of the sector is enshrined in contract or law. Some countries rely very little on contracts, while others use contracts almost exclusively. As a general rule, those that use contracts the most tend to have few mineral resources, making the effort to create legislation more costly than it is worth. Countries with a history of industrial mining tend to have more detailed legislation and rely less on contracts.

The benefits of including more provisions in the legislation are many: First, it makes regulation of the sector much easier for the government. There are fewer differences in the taxes and royalties that need to be calculated and all companies are operating under the same rules for submission of key documents for government approval, such as annual work programs, environmental plans, and others. **For a government that is still building capacity to regulate its mining sector, favoring legislation simplifies the task.**

In addition, **legislated regimes save costs**. Creating new negotiating teams to negotiate over many variables diverts resources away from other important activities in terms of long-term benefits, such as tax collection, developing more geologic knowledge, or building technical expertise in the sector. Finally, legislation that has been created with public participation **creates greater long-term security by preventing successive changes driven more by politics than publicly supported policy**.

Despite these benefits, countries have laws and systems in place that cannot be easily and quickly modified, and may be more difficult to undo than adapting to the existing legislative framework. The decision about when and how to reform the laws and contracts is no simple task. On the one hand, the global economy, and macro-economic and political picture of Mozambique are changing quickly, and indeed many of the assumptions that were made five or ten years ago about political risk and commodity prices, among others, have changed significantly. On the other, investors tend to disfavor regular changes to legislation. The challenge is to put in place a durable legislative framework through a thorough, transparent, and credible process.

Since approximately 2002, Mozambique has been creating a more robust legal framework for mining investments in the country. The country has steadily adopted a series of laws and regulations to manage the industry, with the assistance of development partners and with the insights and input of industry, citizens, and international experts.³⁴³ In some ways, the legal framework governing the exploration, extraction, and taxation of mineral resources is generally in line with mineral legislation around the world. Most recently, Mozambique adopted fiscal laws and regulations in 2007 and 2008. Changing these again in 2011 could be perceived negatively by investors, especially if done hastily. One strategy could be to use the adoption of a model contract as a way of updating current policies without re-writing all existing legislation, especially the fiscal regime. Nevertheless, some fiscal elements might be better placed in law rather than contract.

1.2.1 Updating the mining law

There are several provisions MIREM could consider updating and revising to strengthen Mozambique's legislative framework. This section highlights some of the most important modifications to the law that might be desirable.

1) Getting better fiscal benefits: sharing windfalls, receiving capital gains, clarifying royalty base, and limiting stability

a) Sharing windfalls

There are several fiscal tools that can allow a country to share in commodity price increases and high profitability from a mining project, often referred to as "windfall profits."

Windfall profits tools are different from royalties and taxes, which will tend to limit the government's ability to share in times of high commodity prices or extraordinary profitability of a particular mine. These tools allow the government take to change with increasing returns and thus allow the government to garner differential rents for above-average ore grades and windfall profits.³⁴⁴ These tools, called "progressive" as defined in the box above, allow the government's share of resource rents to

³⁴³ Law no. 14/2002 of 26 June (the "Mining Law"); Decree no. 62/2006 of 26 December (the Mining Regulations"); Law no. 11/2007 of 27 June (the "Tax Regime for Mining"); Decree no. 5/2008 (the "Regulation of Tax Regime for Mining).

³⁴⁴ Jourdan, Paul. *The Utilisation of Mineral Wealth for Development Purposes in South Africa*. Draft (unpublished), 2010.

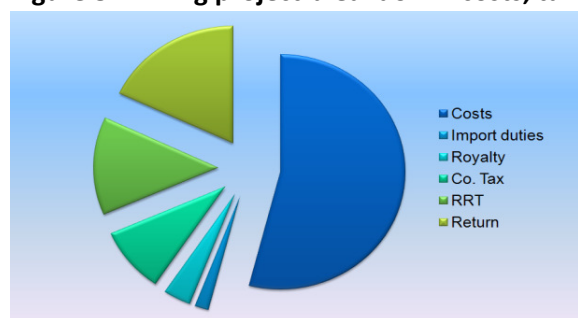
increase along with the companies' profits. These tools "build flexibility into the tax system so that it can accommodate changes to economic circumstances that fiscal rigidity could not cope with. By reducing the likelihood that a change of fiscal terms would be imposed unilaterally, such flexibility would reduce a perception of risk."³⁴⁵

Among these progressive tools, a resource rent tax (RRT, see box) is more tied to the profitability of the project than other progressive taxes on profits.

A resource rent tax (RRT) starts after a certain amount of payback of the investment³⁴⁶ or after a pre-defined rate of return.³⁴⁷ Therefore, the investor is relieved from this tax until the project reaches a satisfactory return.

As shown by Figure 8 below, a well-designed RRT will only capture resource rent and will not impact the return required by the investor to undertake the project.

Figure 8. Mining project breakdown: costs, taxes, rent and return³⁴⁸



The main advantage of the resource rent tax is its "neutrality." A company's calculation of a project's profitability (which in turn influences the decision of whether to invest) discounts future cash payments more heavily than early payments; therefore, RRT payments that would be made many years after the initial investment have only a minimal impact on calculations of profitability, and thus does not divert the investor from the investment.

For these reasons, fiscal regime literature has often urged the use of an RRT and its use may be on the rise (see box on Israel below). Few governments and companies have confidence in what commodity prices and costs may be in the future. In royalty/tax systems, the country bears the risk of price swings; but developing countries are not generally well-equipped to bear these risks, while companies with a diverse portfolio are better placed to do so. An RRT can mitigate this adverse consequence of a normal royalty/tax system. Liberia recently adopted resource rent taxation in its legislation and successfully auctioned an iron ore contact with an RRT.³⁴⁹ The RRT did not apply to contracts currently in force, however.

³⁴⁵ Land, Bryan, "Resource rent taxes: a re-appraisal" in *The Taxation of Petroleum and Minerals: Principles, Problems, and Practice* IMF (2010) at Appendix I, p. 259.

³⁴⁶ These are referred to as R-Factor systems in the minerals fiscal literature.

³⁴⁷ These are Rate of Return or RoR systems in the minerals fiscal literature.

³⁴⁸ Adapted from Land, Bryan, "Resource rent taxes: a re-appraisal" in *The Taxation of Petroleum and Minerals: Principles, Problems, and Practice* IMF (2010) and Jourdan, Paul, presentation for UNDP RBA Regional Project, 2010

³⁴⁹ Land, Bryan, "Resource rent taxes: a re-appraisal" in *The Taxation of Petroleum and Minerals: Principles, Problems, and Practice* IMF (2010) at Appendix I, p. 259.

Israel's New Resource Rent Tax

In the recent amendment to its hydrocarbon regime, **Israel** has established a type of resource rent tax³⁵⁰ kicking in when the company has recouped 150% of its investment. The tax starts at 20% and moves up linearly to 60%, the level at which the investment is recouped by 230%. **To make its case with the investors, Israel also showed that with the exception of the UK, in the peer group, Israel offers the most attractive terms of this group and is clearly competitive under the new regime.**

The disadvantage of the RRT is its complexity in terms of assessment and monitoring. The administrative cost of maintaining a Resource Rent Tax largely depends on the capacity of the host country to monitor mine output and to audit the companies' accounting.

However, the Revenue Tax Administration of Mozambique (ATM) has been recognized for its improvements in tax collection over the last 3 years, with a 15% increase in domestic tax revenues. This tax office has showed its capability of imposing income tax on businesses. With additional skills and staff, it may be able to administer an RRT. As such, this could be a good option for Mozambique's new mining law.

b) Receiving capital gains

Another important fiscal tool for Mozambique to consider is **capital gains taxation**. Highlighted in the circulated draft of Mozambique's first EITI report, **this tax is of particular importance for countries with relatively nascent oil, gas, and mining sectors**. The oil, gas, and mining industries are structured such that smaller exploration companies ("junior miners" or "wild catters" in oil) often take the risk of doing exploration work while the "super majors" generally conduct the large-scale commercial exploitation of these resources. Smaller companies sell their shares or transfer their licenses to these larger companies, often at a great profit. A profit is appropriate and a part of the risk/reward calculus of exploration. However, some amount of this profit is generally considered to belong to the state and should be captured through capital gains taxes.³⁵¹

Mozambique presently has exploration companies searching for new commercially viable resource deposits, and will likely have more in the future. A clear policy on capital gains taxation will provide investors with security regarding their risk/reward calculus and provide the government with additional tax revenues from its resources when these transfers occur.

c) Clarifying royalties

The 2002 mining law states that the Council of Ministers determines royalty rates.³⁵² Subsequently, various royalty rates were set in the 2007 minerals fiscal law. The rates vary according to the mineral. Coal is 3%, for example, while diamonds are 10%.³⁵³

While the royalty rates have been set by law, **the basis on which the royalty rates are calculated has been the source of significant negotiation with mining companies**. The 2002 minerals law provides:

1. Production tax is based on the value of mining products resulting from mining activity undertaken in the national territory, of which a percentage shall be destined to local services where the undertaking is

³⁵⁰ The type of resource rent tax adopted is an "R-Factor" tax.

³⁵¹ Myers, Keith "Selling Oil Assets in Uganda and Ghana: A Taxing Problem" Revenue Watch Institute (24 August 2010).

³⁵² Article 28(4).

³⁵³ Article 9.

carried out in accordance with the terms to be defined through regulations, with the aim of influencing local development.

2. Production tax is also based on the value of mining products:
 - a) Sold or;
 - b) Used for any commercial or industrial purpose other than construction in accordance with the terms of number 2 of Article 40, in any area subject to a mining title.³⁵⁴

Clarifying the base of royalty calculations could eliminate these negotiations and the potential for companies to negotiate a lower royalty base, which would reduce government revenues.

d) Limiting stabilization guarantees

Stabilization guarantees—generally in the form of a legal guarantee by a government to freeze the law or fiscal regime applicable to a project as of the date of the contract—have come under scrutiny in the past decade.³⁵⁵ **Countries that are still developing robust legal frameworks—including Mozambique—are essentially guaranteeing companies an incomplete legal framework for the duration of a company’s contract, which can last several decades.** This serves neither companies nor governments well: when companies are exempt from the current legal regime, there can be confusion, allegations of corruption, inefficiency, and often requests that projects be integrated into the same legal framework as others. On the other hand, companies that invest early in a risky area do require commensurate reward. Finding this balance is delicate.

Mozambique’s 2002 Minerals law provides the following stabilization guarantee:

2. The State ensures that, once the exploration license, mining concession or mining certificate has been issued and is recognized as a foreign or national direct investment project, **the applicable fiscal regime to the mining activity in force at the time of issuing the above-mentioned title shall never be altered, unless the act is to the benefit of the withholder of the mining title.** [...]

4. When more than ninety days have elapsed without a solution to any complaints submitted in writing to an authorized entity **thus resulting or having resulted in financial damages** as a consequence of immobilization of invested capitals **or of change of the mining fiscal regime or any other provision of the mining legislation,** the respective investors shall have the right to a fair indemnity for the damages incurred on exclusive liability of State institutions.³⁵⁶

³⁵⁴ Articles 28 (1) and (2).

³⁵⁵ See Stabilization Clauses and Human Rights, IFC and UN Special Representative on Business and Human Rights (11 March 2008) available at [http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p_StabilizationClausesandHumanRights/\\$FILE/Stabilization+Paper.pdf](http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/p_StabilizationClausesandHumanRights/$FILE/Stabilization+Paper.pdf)

³⁵⁶ Article 33, “Investment Guarantees.” The rest of the article reads:

1. The State ensures the safety and legal protection to property of the goods and rights, including industrial property rights within the context of the authorized and realized mining activity investments under the terms of the mining title issued pursuant to this Law and other applicable legislation. [...]

3. The expropriation of private property goods and rights within the context of the mining title can only occur owing to public interest and shall be subject to the payment of a fair indemnity. [...]

5. The evaluation of good or expropriated rights as well as of financial damages suffered by the investors due to explicit State liability, for the purpose of determining the amount of indemnity as outlined in numbers 1 and 3 of this article, shall be made within ninety days, by mutual agreement, by a commission specially established for this purpose or by a recognized fit, competent auditing firm.

According to companies, these stabilization guarantees are sought to secure financing and insurance. While it is understandable that shareholders and investors would want to ensure a secure revenue stream that is not subject to the whims of politics, an indefinite stabilization guarantee such as that found in Mozambique is excessive and should be repealed in the mining law reform process.

In particular, **a country need not offer further benefits to the company by having an asymmetrical and one-sided guarantee that offers the company the right to opt into legislation that favors it** (see the bolded text in paragraph 2 above). Stabilization can be limited to just core elements of the fiscal regime and for a limited period of time.

More circumspect clauses, such as the article from the mining law of the Democratic Republic of Congo (see box below), **allow investors to secure funding, allow governments to build credibility as a stable investment environment, and do not put companies above the law indefinitely**, which is both contradictory to public policy and often offensive to the citizenry. A more reasonable guarantee can better align the interests of all parties.

Sample stabilization article: Democratic Republic of Congo

Article 276: Guarantee of stability³⁵⁷

The State guarantees that the provisions of the present Code can only be modified if, and only if, this Code itself is the subject of a legislative amendment adopted by Parliament. The rights attached to or deriving from an exploration licence or mining exploitation licence granted and valid on the date of the enactment of such a legislative modification, as well as the rights relating to or deriving from the exploitation licence subsequently granted by virtue of such an exploration licence, including among others, the tax, customs and exchange regimes set forth in this Code, remain acquired and inviolable for a ten-year period from the date of:

- a) the entry into force of the legislative modification for the valid exploitation licences existing as of that date;
- b) the granting of the exploitation licence subsequently granted by virtue of a valid exploration licence existing on the date of entry into force of the legislative modification.

2) Aligning the regulation on confidentiality with the country's transparency policy

In addition to modifying the fiscal provisions, the Government should also consider modifications to regulations on confidential information. The Government of Mozambique has stated its dedication to transparency in many fora. Most recently, President Guebuza recommitted the country to transparency at the EITI Global Conference in Paris on March 3-4, 2011.

As the country updates its Mining Law and Regulations, the confidentiality provision in the regulations can be reformed in line with this commitment. Currently, this provision states:

1. The information contained in reports submitted by the holder of the mining title under the Mining Law, these Regulations, or other rules applicable to mining activities shall be considered confidential, and shall not

6. The payment of the above-mentioned indemnity shall be made by a competent State agency and shall take place within ninety days, or other mutually agreed time-frame, starting from the date when the decision was taken by the commission or when the report by the auditing firm was presented, based on the evaluation made under previous number. The duration of appreciation for the purpose of decision-making about the evaluation undertaken and presented to authorized State agency, shall not exceed forty-five days from the date of handing over and receiving the evaluation file.

³⁵⁷ Democratic Republic of Congo Law no. 007/2002 Code Minier 2002.

be divulged for a period of six months from the date of extinction of the mining title, unless by prior consent of the respective titleholder.

2. The technical information submitted with the application for mining concession or mining certificate, or any extension shall always be maintained confidential, except in case of consent from the respective title-holder.

3. Prohibition of disclosure under the previous numbers shall not be applicable:

- a) To the Minister or other government entity in the fulfillment of obligations imposed by law;
- b) When connected to any judicial or arbitral procedure;
- c) When connected to the definition of the obligations of the title-holder in relation to payments owed to the State.

4. It shall not be considered disclosure of confidential data whenever there is evidence that the disclosed data were already known by the public before its disclosure.³⁵⁸

These broad confidentiality provisions have been the norm in the industry. As countries like Mozambique implement EITI and companies and governments increasingly disclose information to the public, these clauses are quickly becoming outdated. Clauses like the following reflect current confidentiality needs more accurately:

Confidentiality:

(1) Applicants for Mineral Rights and Holders thereof may request the confidential treatment of technical, geological and mining information submitted to the Ministry of Mines and Industries. Such information may be treated as confidential by the Ministry of Mines and Industries until expiration or termination of the relevant Mineral Right. After this period, such information may be made available to the public.

(2) Prior to the expiry of the period of confidential treatment, such information may be used by the Ministry of Mines and Industries for purposes of compiling public records, data and statistics, which may be published without disclosing the confidential parts of the information.³⁵⁹

Obligation of transparency:

The Ministry of Mines and Industries shall collect, not less than annually, and publish reports concerning State revenues and other direct or indirect economic benefits received by the State from Mineral Activities in accordance with internationally accepted norms respecting transparency in the extractive industries. The Ministry of Mines and Industries shall be authorized to, for the purposes of preparing such reports, require Holders of Mineral Rights and all State or public agencies and public officers to, not less than annually, submit data, including production, financial data, and other direct or indirect economic benefits received by them and all amounts paid by them in connection with Mineral Activities.³⁶⁰

As an EITI-implementing country, similar clauses for the new law would be appropriate for Mozambique.

1.2.2 Revising the model contract

Model agreements are very efficient tools for governments. Instead of making changes in the law, new negotiating parameters can be defined with model agreements, limiting the number of variables in a negotiation. This is particularly true when the model agreement is passed into law or regulations and negotiations are limited by law to a narrow set of fiscal benefits and other non-fiscal benefits specific to a particular industry and project.

³⁵⁸ Article 109 Confidentiality.

³⁵⁹ Minerals Law of Afghanistan, Article 103. Available at http://www.bgs.ac.uk/afghanminerals/docs/Minerals_law.pdf.

³⁶⁰ Minerals Law of Afghanistan, Article 100(3), "Obligation of Transparency." Available at http://www.bgs.ac.uk/afghanminerals/docs/Minerals_law.pdf.

1) Add a biddable RRT

If Mozambique uses bidding systems for some of its projects, a model contract could be used to create competition to drive up the fiscal benefits for the country through competitive bids. Bidding allows competition among investors to determine the true value of the resources.³⁶¹ Bidding on one or more elements of an RRT could be used to enhance fiscal benefits, without requiring a change to the royalties and taxes in the current law. In Namibia, although the main elements of the petroleum RRT are stipulated by law, two higher RRT rates are biddable.³⁶² Peru's relatively young hydrocarbons sector moved to public auctions with a biddable royalty with considerable success at achieving higher royalty rates.³⁶³ A modified version of this process could be used in Mozambique. **Future contracts could have the current fiscal regime as a base, with a biddable RRT used to determine the winner of a concession.**

2) Consistent capital allowances and depreciation

In addition to an RRT, Mozambique may be able to capture more fiscal benefits with uniform rules for capital allowances and depreciation schedules (see box).

Capital allowances enable a company to reduce tax payable on profits by allowing some of its capital expenditure to be offset against taxes owed.

Depreciation refers the allocation of the cost of assets to periods in which the assets are used. Like capital allowances, depreciation allows for offsets against the payment of taxes for a particular year. Thus, while not lowering the tax rate, both capital allowances and depreciation lower the taxable income per fiscal period.

Currently, Mozambique has negotiable rules on depreciation and capital allowances. These are areas where the country loses revenues. These issues could be dealt with by adoption of consistent standards in the model contract. This would eliminate the need to pass new laws or regulations; however, previously signed contracts would not be included in the streamlined system, unless they were renegotiated accordingly.

3) Revise the confidentiality clause and provide the contracts to the public

Mining contracts have historically been kept confidential from the public—even from parliamentarians and other ministries in extreme cases. Contracts signed often have confidentiality clauses in them that read like this, with minor variations.

2005 Mineral Development Agreement, Mittal Steel and Liberia

Section 1. Confidential Information

All information exchanged between the Parties hereto in the context of this Agreement **shall be considered and treated as confidential information**, subject to Article VII, Section 2 of the MDA. The Parties hereto hereby agree not to divulge such information to any other Person without the prior written consent of the other party, which consent shall not be unreasonably withheld and/or delayed. However, the foregoing shall not be applicable to CONCESSIONAIRE's or the GOVERNMENT's bankers, advisors and all those who are, in a special way, connected with the Operations.

³⁶¹ Land, Bryan, "Resource rent taxes: a re-appraisal" in *The Taxation of Petroleum and Minerals: Principles, Problems, and Practice* IMF (2010) at Appendix I, p. 259.

³⁶² Ibid

³⁶³ See <http://www.perupetro.com.pe/wps/wcm/connect/perupetro/site> and analysis conducted by Columbia Law School Human Rights Clinic, on file with authors.

2005 Mineral Development Agreement, Mittal Steel and Liberia

Section 2. Public Information

The obligation of confidentiality set forth in Article VII, Section 1 above **shall not apply either to information** exchanged between the Parties hereto which is **in the public domain or to information** exchanged by the Parties which the **CONCESSIONAIRE is required to reveal** to any other Person **by law** applicable to it.³⁶⁴

There is increasing evidence that disclosing contracts, particularly biddable contracts, increases the benefits to the government. In the absence of collusion, it creates a race to the top instead of a race to the bottom. In the Peru bidding example cited above, since the country adopted a transparent, public bidding system with disclosure of winning hydrocarbon contracts, the royalty rates bid by the companies has consistently been on an upward trend. Disclosure of contracts already signed has resulted in significant gains, too.

Liberia: Contract Disclosure to Leverage Bargaining Power and Gain Investor Interest

In Liberia, the Ellen Johnson-Sirleaf Administration quickly stated that one of its immediate priorities was the renegotiation of contracts signed by the previous transitional government. The first contract renegotiated was the 2005 Agreement signed with Mittal Steel for the former Lamco iron ore mine. The government sought and achieved return of control of key infrastructure, such as the rail line from the Lamco mine to the port of Buchanan and the port itself. The government also increased its financial take from the contract, eliminated tax holidays, and closed tax loopholes that could have allowed the company to transfer offshore the returns to the Government in the original contract.³⁶⁵

One of the drivers of this successful renegotiation was the disclosure of the original contract with Mittal Steel. Groups in Liberia as well as abroad criticized the contract for being out of line with good practice in the mining industry. It significantly bolstered Liberia's ability to renegotiate the contract since it had national and international support, including the support of the international donors, who have historically been reluctant to support renegotiations. A group of experts from various disciplines was put together to review all contracts and make recommendations about whether they needed to be renegotiated, cancelled, or kept in the current form.

Following this successful renegotiation, which included provisions for many best international practice standards on transparency, social, and environmental standards, the Government passed new legislation and regulations for the mineral sector using the renegotiated contract as a model.³⁶⁶

Today, the Government of Liberia publishes all of its contracts in all natural resource sectors—oil, gas, mining, timber, agriculture, and others.³⁶⁷ **It has not deterred investment.** Since renegotiating its contract with Mittal Steel, several more multi-million dollar mining contracts have been concluded. The Johnson-Sirleaf administration has concluded US\$16 Billion dollars in investment since taking office and beginning to publish the investment contracts.

³⁶⁴ Rosenblum, Peter and Susan Maples, *Contracts Confidential: Ending Secret Deals in the Extractive Industries*, Revenue Watch Institute (2009), at 24.

³⁶⁵ Heuty, Antoine, Raja Kaul with Alvina Norman *Getting a Better Deal from the Extractive Sector: Concession Negotiation in Liberia, 2006-2008*, Revenue Watch Institute (2009);

³⁶⁶ Rosenblum, Peter and Susan Maples, *Contracts Confidential: Ending Secret Deals in the Extractive Industries*, Revenue Watch Institute (2009), at 52.

³⁶⁷ Available at http://www.leiti.org.lr/content_maindoc.php?main=65&related=65.

Oil, gas, and mining companies possess far more resources, knowledge, and experience in all aspects of their industry, including the negotiation of contracts, than their government counterparts. They have access to contracts and fiscal regimes around the world through either their own network of experts and databases or external databases, consultants and law firms that regularly do mining work and use those agreements as templates for negotiations. Companies can compare and undermine government bargaining power with these resources.

Some companies have requested contracts be disclosed, particularly when citizens are demanding it and failing to disclose risks disruptions to the operating environment.

Uganda: Failure to Disclose Breeds Resentment and Mistrust, and Inhibits Operational Performance

Uganda is said to have oil contracts that provide a good rate of return for the country according to various independent analysts.³⁶⁸ However, the government has consistently refused to disclose the contracts, and calls for renegotiation grow amid mistrust of both the government and the company.³⁶⁹ At least one company in Uganda has expressed its desire that the government disclose these contracts. Uganda's oil is on-shore oil and will be susceptible to community attacks, much like that in the **Niger Delta**.

Mining investments are also at risk of these sorts of attacks. Citizens in **Liberia** started dismantling a mining railroad when the company's sub-contractor refused to pay appropriate wages. Mozambique and mining investors could face similar disruptions in the absence of transparency and dialogue with not just the communities around the mine, but along all major mining infrastructures.

In a sector that sees its contracts renegotiated more than any other sector, disclosure can help bring the stability that investors seek, which cannot be guaranteed by law alone.³⁷⁰ Disclosure can also help companies attain the so-called "social license to operate."

Disclosing contracts poses few risks. Governments can seek consent from companies to disclose their previously signed contracts and can require disclosure in future contracts. While contract disclosure is not yet standard practice, a number of countries have disclosed contracts: the United States, Liberia, Timor-Leste, Peru, Bolivia, Ecuador, Mongolia, Azerbaijan, and Sierra Leone, for example.

Mongolia: Parliamentary Passage and Disclosure of Contracts Provides Stability and Investor Interest

Mongolia, much like Mozambique, has untapped world-class mines of vital commodities. The country requires parliament to ratify contracts with its foreign investors for these valuable and non-renewable resources. It also publishes these contracts in their parliamentary record. Mozambique does not appear to have such a law, but it might consider including such a policy in the future.

³⁶⁸ Myers, Keith, "African Oil and Democracy: A Combustible Mix" February 4, 2011, on Revenue Watch website, available at <http://www.revenuewatch.org/news/news-article/international/african-democracy-and-oil-combustible-mix>. Also, Professor Jacqueline Weaver of University of Houston at International Conference on Extractive Industry Contracts, September 23, 2009 in Washington, D.C. Transcript on file with authors.

³⁶⁹ Lay, Taimor, "Uganda Oil Contracts Give Little Cause for Optimism" The Guardian (18 January 2010) <http://www.guardian.co.uk/katine/katine-chronicles-blog/2010/jan/18/uganda-oil-profits>.

³⁷⁰ Ted Moran, Harnessing Foreign Direct Investment: Policies for Developed and Developing Countries, Chapter Three "FDI in Extractive Industries and Infrastructure" at 76: "Across all types of FDI (foreign direct investment), contracts and concessions to foreigners in natural resources and infrastructure have proven to be the most unstable."

Mongolia: Parliamentary Passage and Disclosure of Contracts Provides Stability and Investor Interest-continued

While negotiations have been long and hard, with parliamentary hearings capturing the Mongolian national interest, investors gain greater stability as a result of the public debates and the government has greater leverage, backed by the clear demands of the public and parliament. The country recently negotiated the Oyu Tolgoi copper mine with Ivanhoe Mines and Rio Tinto, and investors continue to show great interest in the country.³⁷¹

To date, neither Mozambique nor its extractive industry investors have disclosed its contracts, though we understand that calls for disclosure and updating of the contracts are growing. If this situation remains, there is significant risk that the issue will become more politicized than at present, making a relatively amicable and mutually agreeable outcome less likely.

Finally, **disclosure helps with enforcement of contracts**. Too often, ministries do not effectively share information or have insufficient knowledge sharing mechanisms, leading to poor enforcement and regulation. A few of the ministries that may need access to natural resource contracts include: Ministry of Finance for tax collection; Ministry of Planning and Development for forecasting the industry's future contribution to the budget; and the Ministry of Cooperation for Environmental Affairs, for ensuring compliance with its legal framework. Much can be gained by making these contracts publicly available, so all ministries can play their role in regulating the sector and citizens groups can assist in providing expertise, monitoring implementation, and participating in the development of the sector.

Adoption of the confidentiality clause in the draft 2007 model mineral agreement would mandate the disclosure of contracts.

Draft Model Mineral Development Agreement for Mozambique

Article 25, Confidentiality

25.1 Agreement not confidential. This Agreement is not confidential and a copy shall be made available by the MIREM at its central office for inspection by the general Public during normal office hours.

Making the contracts available to the public online and provided to local communities would improve this language even further. Adoption of this clause or a similar one will provide greater stability for future investors.

1.3 Current contracts and legal reform processes

Perhaps the most difficult aspect of any legal reform effort is whether and how to bring old contracts into the new system. This is true even when a country is revising a model contract—that too will create a new and old system, with some contracts having unique fiscal regimes and various other obligations while new contracts signed with the model will be much more uniform.

Companies tend to resist bringing existing contracts into compliance with new laws, preferring to keep the original deal agreed to, while **Governments and citizens generally prefer to see all projects evolving with the country instead of remaining behind**. Countries can attempt to mandate compliance with new

³⁷¹ "Banks in Mongolian coal 'gold rush'" Financial Times, February 8, 2011, available at <http://www.ft.com/cms/s/0/c8ebc000-33c0-11e0-b1ed-00144feabdc0.html?ftcamp=rss#axzz1DSa4KuDm>.

systems, but they may receive considerable resistance from companies with arguments based on stabilization agreements or claims for compensation under international investment law. Companies may abandon their operations or stall them to pressure the government. When prices are high, companies may agree to negotiate, as the assets in the ground and sunk costs in immovable productive assets are worth retaining. In fact, **in some countries, companies have agreed voluntarily to come into new legal systems.**

When a country revises any part of its legal framework that regulates the extractive sector, it may find itself in the position of **choosing whether to update contracts that are under old regimes if they included stabilization guarantees.** Assessing the bargaining power that the country has to bring older contracts into a new system is difficult without accurate knowledge about the fiscal benefits the country will receive and whether it is similar to its peer group. To make this assessment, **a high level and broadly representative Commission is advisable,** which could benefit from the international expertise of the Resource-Based Development Advisory Group, discussed in the conclusion. Once bargaining power is understood more by such a technical exercise that includes financial modeling and a projection of non-fiscal benefits, Mozambique will know more about its leverage vis-a-vis current investors. Several paths could be taken to ensure all parties have durable, mutually beneficial contracts through a well-planned reform and streamlining of the mining sector; the recent experiences of Liberia, Israel, and Mongolia, discussed above, can be instructive.

1.3.1 Mining policy commission: an example from Tanzania

A high level commission led by Judge Mark Bomani, a well-respected figure in Tanzanian society, was tasked with reviewing the mining sector—including contracts—in Tanzania.³⁷² Tanzania faced a situation potentially similar to that of Mozambique: investments appeared to be generating few fiscal resources for the government. The Commission looked at the fiscal and non-fiscal benefits of contracts, and many other aspects of the mining sector, including infrastructure, small business, and local communities. With respect to the fiscal regime, the Government drafted a new mining law, which included a number of measures to increase fiscal benefits. These included increased royalties, authorization for the Minister of Mines to use a model Mineral Development Agreement (or model contract) and changing the base on which royalties are calculated—all issues Mozambique is considering as well. According to parliamentarians that were a part of the rulemaking process, several mining companies voluntarily agreed to adopt the new rules.³⁷³ For instance, some gold mining companies agreed in 2007 to forgo 15% annual investment allowances on unredeemed capital, bringing forward the likely date at which income tax would start being paid.

Mozambique’s Commission could also coordinate with the Southern Africa Development Commission (SADC) to bring comparative experience and approaches. One of SADC’s goals is to harmonize the approach of the region to tax incentives, eliminating discretion and ensuring that existing tax incentives are effective. Such a process will “endeavor to avoid harmful tax competition” according to the SADC.³⁷⁴ **Regional cooperation on such matters can drive a race to the top by companies and bring a consistent and level-playing field throughout the region,** a goal of the AU Mining Vision as well.

³⁷² The full report is available at <http://resources.revenuewatch.org/en/official-document/report-tanzanian-presidential-mining-review-committee-advise-government-mining-sec>.

³⁷³ Interviews, Dar e Salaam, May 2010.

³⁷⁴ The SADC Memorandum of Understanding on Co-operation in Taxation (2002), Article 4.3

1.3.2 Reviewing current contracts

The International Finance Corporation is in the process of changing its policy on contract disclosure. According to a recent draft of its Performance Standards, the IFC would ask for full contract disclosure from all extractive industry investments it makes, both current and future. **Instead of requiring the immediate disclosure of current contracts, the draft requests that governments and companies do this in two years**, giving the Government and investors time to thoroughly review their contracts and improve upon any areas they wish before the disclosure.

Mozambique could approach its investors and explain that it needs to disclose its contracts by a certain date, particularly as calls for updating the contracts grow. The potential for increased attacks at the current contracts, de-stabilizing existing investments and resulting in an unnecessary politicization of the contracting process, is only growing. It is in everyone's interest to disclose these contracts as soon as possible.

Here too, this independent and well-respected commission could review the various aspects of the contracts. If some contracts demonstrate a need for stricter standards to protect human rights and the environment or to prevent tax avoidance, then amendments or riders to the contracts may be considered.

Regardless of which option is feasible and ultimately chosen, **the proposed Commission could bring together the views and concerns of government, companies,³⁷⁵ citizen groups, and Mozambican society more broadly**; the Resource-Based Development Advisory Group could provide support, such as with comparative research, technical analysis, and financial modeling. A Commission like this **provides credibility not only to investors, but more importantly, to the citizens of Mozambique.** It is necessary to understand Mozambique's current fiscal regime, ensure the public understands the costs and benefits of different policies, and whether the contracts should be updated to ensure long-term mutual gains by the contracting parties.

Ideally, companies would voluntarily come into any new mining law recommended by such a Commission; and further, companies could voluntarily adopt as a rider any provisions in the new model contract that were either absent or contradictory to their existing contracts. Such good-faith reconciliation by companies would be of tremendous benefit to Mozambique and provide a solid foundation for the long relationships that mining inherently involves well into the future.

2. Using the EITI as a springboard for better resource revenue results

The Extractive Industries Transparency Initiative or EITI is a multi-stakeholder (companies, government, and citizens) forum promoting dialogue about the benefits of oil, gas, and mining resources through the publication of payments made to governments from companies and receipt of these revenues by government. Launched in 2003, the EITI now has 35 countries actively implementing the initiative, ranging from Afghanistan to Norway to Zambia. It has wide support from numerous companies, governments, and citizens around the world.³⁷⁶ Critically, the initiative seeks to support countries in realizing more benefits from their natural resources, not by raising taxes or royalties, but by providing a mechanism to improve management and oversight of the sector.

³⁷⁵ For example, through the business associations.

³⁷⁶ www.eiti.org

2.1 “MEITI” - EITI in Mozambique

Mozambique became an EITI candidate country in February of 2008. In accordance with EITI procedure, the MEITI (Mozambique EITI) multi-stakeholder group has facilitated the EITI process, and the country is currently conducting its first EITI report. The first report focuses on six companies’ payments and government receipts for 2008. The six companies reporting in this report are Sasol, HAMC, Kenmare Moma, Vale, Compania Moz Hidrocarbenetos, and Rio Tinto. In the first round of information gathering, these companies reported paying approximately US\$6,799,174 (at exchange rate of 30 meticaïs to the dollar), while government recorded receipts of US\$3,076,655.³⁷⁷ Subsequent drafts reduced this discrepancy from nearly half to only 3%. Such steps—of **locating, organizing, and analyzing information are critical first steps to better administration of the mining revenues and of the sector more broadly.** This reconciliation process is the foundation of effective tax collection and revenue administration.

2.2 EITI can be shaped and designed to fit the individual implementing country’s needs

There is undoubtedly much gained by bringing diverse stakeholders to a common room to discuss issues about revenues reportedly paid and received; this is the core of the EITI and is in itself useful exercise for countries. But EITI can go well beyond its basic form of disclosure of aggregate payments and revenues, as Mozambique has already chosen to do. Countries have expanded and modified the EITI in many ways.

EITI: Tailored Programs

Liberia – adopted an EITI law that includes disaggregated revenue transparency in the forestry sector in addition to the oil, gas, and mining sectors. All contracts are also disclosed on the Liberia EITI website.³⁷⁸

Nigeria – has an EITI law that goes well beyond disaggregated reporting by an aggregator. The country does audits, which means it uses a certified professional in auditing. The country conducts not only financial audits of the revenues, but also physical and process audits to ensure the country is actually getting what it is owed. It has since learned that while companies reported what the government receipts showed, there were leakages in other areas. The process audit showed that the reported production-based taxes did not always match what was actually produced. On profits-based taxes, the audit showed that the Nigerian Government was relying on the companies’ own numbers; the Government was not doing any independent assessment to see if the reported profits-based taxes matched the companies’ real profits.³⁷⁹

Timor-Leste – does not have an EITI law, but it too has made its contracts available to the public as a part of its comprehensive transparency goals. It also recently launched a transparency portal for its budget, so that citizens can see real time information about how the country’s resource revenues are being spent (for more, see Chapter 4).³⁸⁰

2.3 Possibilities for MEITI

Mozambique has already adopted disaggregated reporting of major revenue streams, meaning that each material revenue stream will be disclosed for each reporting company. These payments to governments will be disclosed, and governments will disclose what they receive. This is already above

³⁷⁷ See Report on the Preparation and Reconciliation of First EITI Report.

³⁷⁸ <http://www.leiti.org.lr/>

³⁷⁹ <http://www.neiti.org.ng/>.

³⁸⁰ Office of the Prime Minister of Timor-Leste, Address by the Prime Minister on the Launch of the Timor-Leste Transparency Portal (15 March 2011) press release and portal *available at* <http://transparency.gov.tl/public/index.jsessionid=C84E16D92FD6F73930F3FD02C8578302>.

the most basic form of EITI, and is showing its value. In the early drafts of the first MEITI report, discrepancies were identified. It should be stressed that this is not *prima facie* a bad thing. Countries regularly find discrepancies, both through EITI and otherwise. The later drafts reduced this gap significantly; it is exactly this **process of accountability that is the significant benefit of EITI**. Since it is a widely supported and funded global initiative, EITI allows countries that may not otherwise have the resources to reveal differences in accounting methods, mineral valuations, and legal loopholes it may not have known it had. Nevertheless, there is significant room for expansion of MEITI.

2.3.1 Increase the coverage of companies reporting

The first report covered only six companies when the country has many more in various phases of project development, including exploration. In future reports, this could be expanded to cover more investments that are clearly material for the country, such as the upcoming Rio Tinto/Riversdale project in Tete.

2.3.2 Expand to cover financial and process audit

To continue with the goals of multi-stakeholder dialogue and partnership, Mozambique and its investors could leverage the EITI to ensure that the country receives the maximum benefit the investors have legally promised to provide. There can be misunderstandings and different interpretations of fiscal responsibilities and obligations that can be resolved amicably and in a way that gains trust instead of charges of theft or corruption. With the normal or basic EITI process, only a “reconciler” is used to find, collate, and analyze data. It is not as robust as a full audit by an accountant. While reconciling data will lead to important information and some answers, it will not lead to as many answers as auditing.

Nigeria’s full financial, process, and physical audits allow the country to answer the question: are we getting what we are entitled to? Where, specifically, is there loss due to miscalculation, theft, or inefficiencies? **Financial audits review the books of governments and companies to ensure what is claimed is accurate; process audits ensure that the money is not lost in the process of making payments and receiving them; physical audits assess at what price the commodity was sold and ensures that the claimed production for calculation of royalties or production share is correct.**³⁸¹

Such robust auditing, when combined with contract disclosure and financial modeling discussed below, produces real information that all parties can use to understand the full picture of the extractive sector and what costs and benefits it is bringing to all parties and what can be improved to strengthen the benefits of the sector for all stakeholders.

2.3.3 Include CSR expenditures

Since Mozambique is relying on considerable corporate social responsibility (CSR), linkages, training programs, and infrastructure benefits from its mining mega-projects, its EITI program could be expanded to include these, too.³⁸² While not yet a standard in EITI, several other countries relying considerably on

³⁸¹ See 2005 NEITI 2005 Audit simplified, available at <http://www.neiti.org/ng/files-pdf/News-2005NEITIAuditSimplified-221210.pdf>.

³⁸² This is another area that could benefit from a clearer policy. Currently, Mozambique does not have a consistent policy on CSR, though MIREM is already beginning to create a plan for doing so. Interviews in Mozambique indicate that there could be confusion among stakeholders as to what is expected of them (companies) and what they can expect (government, citizens). Several interviewees from different parts of society said that companies across the country had built schools, houses, and

CSR programs and linkages are considering including these investments in their EITI.³⁸³ Mongolia and Liberia include social and community payments, for example. Mozambique could be a part of a pioneering effort to include reporting of quasi-fiscal benefits.

2.3.4 Include contract transparency

Several countries are already including contracts in their EITI, and even more countries disclose them. EITI can be an easy way and good place for countries disclosing contracts to house this information, both in-country at the national EITI secretariat office and online.

2.3.5 Link to budget transparency

The EITI covers the money flowing into a country, but it does not cover how it is spent for development. Highly transparent countries like Timor-Leste have introduced transparency portals so that citizens and companies can be assured that resource revenues are spent for development. This is covered in much greater depth in Chapter 4 of this report.

2.3.6 Adopt an EITI law

Currently, there is no EITI law in Mozambique. It is not required by the EITI, but can provide the opportunity to expand the EITI beyond its present scope with suggestions like the above. Alternatively, as Mozambique revises its mining law, it could include a chapter on EITI.

In conclusion, **the EITI can help countries increase their revenues from natural resources, without changing their fiscal laws or contracts**—simply by getting what they are already owed more effectively. Companies can demonstrate the core form of corporate citizenship, being a timely and honest tax payer. All parties gain mutual trust through the discussion that the EITI engenders. An expanded EITI and EITI law could deepen the benefits for all stakeholders.

3. Strengthen implementing institutions

A World Bank trust fund for building civil society capacity to engage in EITI is scheduled to support civil society groups in Mozambique to deepen their knowledge and involvement in the EITI. This and other programs to build a knowledgeable citizenry are valuable investments for governments, companies, and donors. Citizens and lobby groups are better able to understand difficult policy choices and corporate strategies when the complexities are known by all involved.

Moreover, **MIREM can continue to deepen and strengthen its programs for contract negotiation in its capacity building programs for ministry staff.** Building on a UNDP regional program on investment contracts, MIREM has been and is planning to increase training for young members of the relevant

training centers, but had not provided the recurrent expenditures necessary to make these structures operational over the long-term. Even this perception could be problematic, regardless of the underlying arrangements. For CSR policies to have their intended effect—compensatory benefits to local citizens and so-called “social license to operate” for companies—such confusion can turn well-intended programs into sources of conflict, undermining their purpose. Even more importantly, ensuring the long-term benefits of these programs requires a solid, transparent understanding at the start. The draft model contract contemplates community benefit agreements to be signed between companies and communities. This would provide clarity for all parties on expectations, involve the community, and ensure the benefits were those desired by the communities.

³⁸³ Discussions with EITI stakeholders, March 2011.

ministries to negotiate contracts, and is interested in longer training programs on this topic. There was also interest in strengthening the coordinated approach to tax collection by MIREM and the Ministry of Finance, particularly as more mining projects go into production. The IMF is quite active in Mozambique on natural resource sector fiscal governance, and may be able to provide additional assistance through its technical assistance programs, as might other donors, such as Norway. The Government is very interested in using independent economic models for negotiating contracts and regulating the sector. The UNDP regional program on investment contracts has provided some expertise in this regard and may continue to do so. Universities and think tanks, international and domestic, would make natural partners for all of these activities. Such partnerships have been considered successful in the past in areas like macroeconomic modeling.³⁸⁴

Finally, the private sector can play an extremely important role by living up to the law and going beyond it, even when the capacity of the other players to do so is still forming. Many of the companies operating in Mozambique have great technical expertise, and discussions in Mozambique indicate that they are working to build the knowledge of the government as well, for example by providing comparative international experience with laws and regulations. This dialogue is a good start, and working to ensure it involves citizen groups and experts will ensure this dialogue is in society's best interest. The multi-stakeholder Zambezi Valley Resource Policy Forum, suggested in the Conclusion, the Commission suggested in this section, and MEITI are natural places for these discussions to occur.³⁸⁵

³⁸⁴ Interviews, March 2011.

³⁸⁵ Ibid.

4. Conclusion and summary of recommendations

Recommendations	Main Features	Led by	Stakeholders	Technical Assistance
A commission to lead comprehensive review and updating of legal framework and assess grounds for upgrading contracts	<p>This commission could:</p> <p>1) Review current contracts and legal framework, ensure lessons are learned and assess whether and how current contracts might merge into the new framework. In particular, the commission could focus on reviewing the fiscal and non-fiscal benefits of existing legislation and contracts, and the possibilities for (1) implementing resource rent taxation, (2) implementing capital gains taxation, (3) clarifying the royalty base, (4) limiting the currently overly-broad stability guarantee, (5) reforming confidentiality provisions to reflect government policy of transparency, and (6) streamlining depreciation schedules and capital allowances. Other mineral policy aspects, not dealt with in this report, could also be included in the review, such as resettlement policies and artisanal and small-scale mining, among others, similar to the Tanzanian Bomani Commission.</p> <p>2) Reflect the diversity of Mozambican society and include a wide-array of expertise to have international and national credibility. It could also usefully rely on the many pro bono and international perspectives from SADC colleagues, the Resource-Based Development Advisory Group, and others.</p> <p>3) Provide updated Mining Laws and Regulations and an updated Model Contract</p> <p>4) Plan for independent financial modeling to be conducted for all future contracts after the Commission has completed its work</p>	MIREM	AMDCM, PPP, and Concession Holders, Civil Society Organizations (CSOs)	WB, IMF, AfDB, UNDP, SADC, IFC, Academia
Training scale-up for implementing institutions	<p>Building on trainings in contract negotiations from UNDP with deeper and longer trainings for all relevant ministries, with a focus on skill-building such as financial modeling and mock negotiations</p> <p>Scaling up auditing training, particularly if more complex taxation mechanisms are included in an updated law (like the suggested RRT) and/or model contract</p>	MIREM, Min. of Finance	Min. of Finance, MPD, MTC, AMDCM, CSOs, Academia	UNDP, AfDB, IMF, WB, Academia
Deepened and strengthened EITI	<p>Deepening the EITI to include (1) more companies (2) financial, physical, and process audits (3) contract disclosure (4) infrastructure and CSR expenditures and audits and (5) link to budget transparency</p> <p>Using an EITI law to implement these innovations</p>	MIREM and MEITI	Multi-Stakeholder Group	World Bank Trust Fund for EITI, AfDB

Conclusion

This report has attempted to outline a vision for a holistic, regional approach to resource-based development, highlighting both the need and opportunities for multi-stakeholder collaboration. The report reflects some promising initiatives that are already underway as well as the shared sense in the region that further coordination and support are necessary to truly leverage the natural resource sector for high and sustained growth rates, equitable benefits, and widespread, environmentally sustainable poverty reduction in the region.

This holistic approach, outlined in this report, is certainly ambitious; however, we believe that with adequate support and pooled resources, many of these opportunities are indeed within reach. Resource-based development is unique: the fact that the resources are non-renewable means that depletion is a core reality that must be planned for, and the opportunity to leverage resources for development is a one-time opportunity. Once depleted, these non-renewable assets can no longer be a driver of growth, unless the groundwork is laid early for a sustainable transition to a “diversified, vibrant and globally competitive industrializing” economy, as described in the AU Mining Vision.

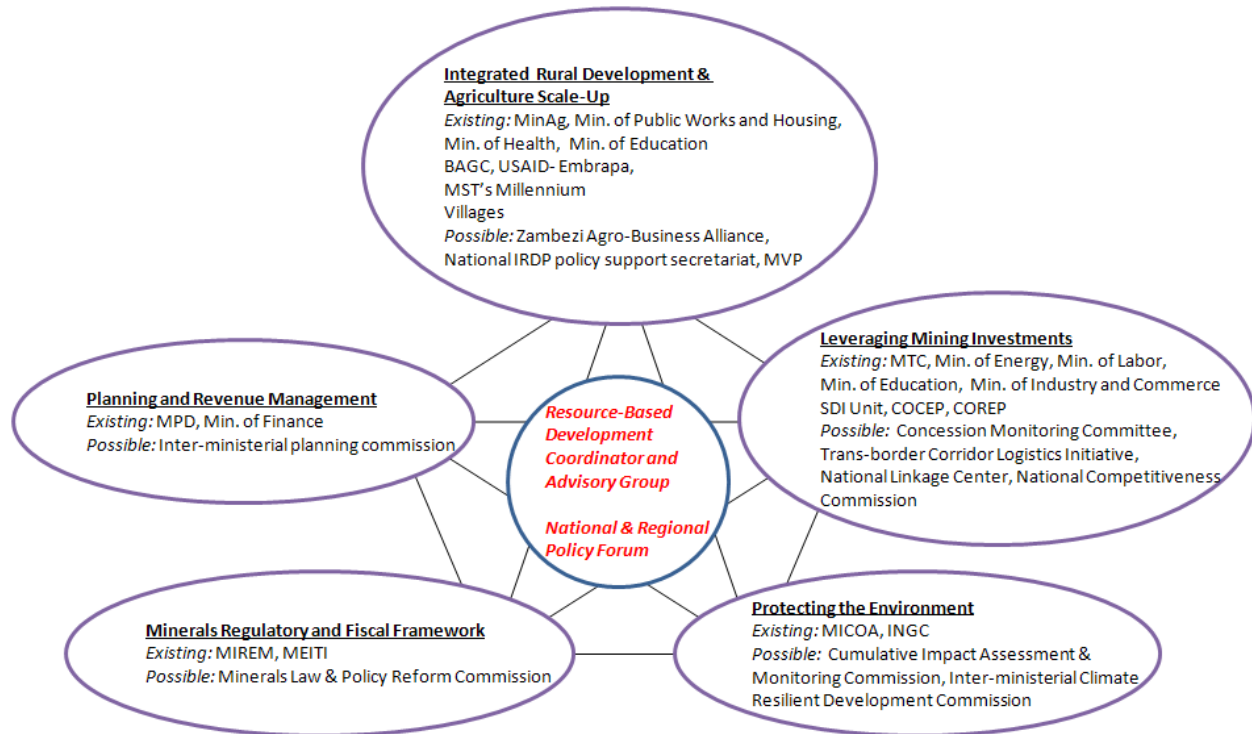
The goal of this report is to support existing initiatives and propose new ideas to ensure that a resource-based development strategy is implemented meaningfully in the region. **This draft is a consultative draft.** Although every opportunity and idea in this report reflects conversations and information accessed in the region, **the VCC will now consult widely with this report: (1) to seek guidance on whether this report accurately reflects the vision of the stakeholders, and (2) to work with stakeholders to develop a road map for implementation.**

Mozambique is particularly rich in institutions focused on and advancing key priorities of resource-based development, including several ministries that are at the forefront of developing policies for equitable and sustainable development in the region. Therefore, a useful starting point for an implementation plan could be to establish a **Zambezi Valley Resource-Based Development Coordinator**, based in the office of the President or Prime Minister, who could support and coordinate the various stakeholders working toward the development of the Nacala and Beira corridors. The Coordinator could provide key support to the relevant ministries, facilitate communication and collaboration among the various stakeholders and institutions in the region, and liaise with the international Resource-Based Development Advisory Group, discussed below.

The first initiative of the Zambezi Valley Resource-Based Development Coordinator could usefully be to map out existing institutions and initiatives, and then to help devise a realistic process for communication and collaboration among those institutions. To begin this exercise, the VCC has identified several existing institutions that could be at the core of a resource-based development implementation strategy (Figure 9). The VCC has also mapped new entities, suggested throughout this report, to bridge possible institutional gaps. As one might recall from the methodology for this report described in the introduction, this report does not address several aspects of development that regional stakeholders may want to consider in this mapping exercise—namely, those institutions addressing gender and labor rights, resettlement, land rights, and artisanal mining, among others. Also, as mentioned in the introduction, although this report does not address the role of the hydrocarbon sector in the resource-based development strategy, hydrocarbons are also a non-renewable resource that

should be integrated in a broad resource-based development strategy, and should be integrated in this approach in later steps.

Figure 9. Network of existing and suggested institutions, key to resource-based development



This mapping is not comprehensive but is illustrative of the connections and coordination that are both possible and necessary. This figure also does not include key stakeholders such as community groups, civil society organizations, development partners, regional bodies, and academic institutions that have important roles to play in implementation. A more complete mapping of key stakeholders and institutions should be a priority for the Resource-Based Development Coordinator. This mapping of existing initiatives will yield tremendous returns, if widely supported by committed stakeholders willing to coordinate their activities to take advantage of their synergies.

In addition to the local and regional institutions and stakeholders, there are also many international partners that are committed to Mozambique's growth and development. Many of these partners have expertise and international perspective that could support the resource-based development strategy in Mozambique. These partners too often fail to communicate and coordinate their actions—not out of ill will, but because they lack a designated space and resources to do so. To this end, as indicated in figure 6, a **Resource-Based Development Advisory Group** could usefully be assembled, composed of international and regional individuals with a range of perspectives and expertise that can assist in the planning and implementation of a resource-based development strategy. This group could include experts in taxation, transport logistics, engineering, development practice, agriculture, water resources, financial management, environment, climate/meteorology, geology, and other relevant disciplines, that are committed to Mozambique's development and would support the Government and other stakeholders on a voluntary basis.

In its early years, this group should meet at least twice a year, of which one meeting would be concurrent with a **Zambezi Valley Resource Policy Forum**. Such a Forum, convened at least once per year, would bring together all stakeholders to assess needs and opportunities, monitor progress, and plan for the future. The Forum would also provide a credible interface between extractive industries and governments, to align the respective needs and interests of industry and society, and to focus on the special challenges and opportunities for extractive industry companies. Indeed, missed opportunities for better coordination of all stakeholders (often due to a lack of open and consistent communication throughout the life of a major project), can lead to misunderstanding and mistrust, and consequently suboptimal returns on a project for all involved.

The first part of the Forum could be a closed-door summit between the government (local, regional, and national) and investors (local leadership and headquarters), followed by a summit of all stakeholders, including domestic and international civil society, donors, regional development banks, diplomats, future investors, and representatives from other industries (agriculture, for example).

The Zambezi Valley Resource Policy Forum would:

- Be a regular space for discussion, monitoring, evaluation, and planning
- Create a space for open and consistent communication between government officials and corresponding mining companies' departments (e.g., Ministry of Mineral Resources with project management, Ministry of Transportation and Communication with spatial strategy executives, Ministries of Health and Education with social program managers, Ministry of Environment with risk mitigation executives....) in a coordinated fashion, as opposed to company-by-company discussions
- Allow effective regulatory partnerships at all government levels (local, regional, and national) and among government ministries (mineral resources, environment, education, science and technology, transportation and communication, agriculture, etc.)
- Highlight areas in which mining companies can help build capacity in relevant governmental sectors (at national and sub-national levels)
- Allow the government and industry representatives to hear directly from the communities, and for communities and civil society organizations to share experiences and concerns

This Forum would not only allow the extractive industries to engage in national and regional development policy, but could also help set best practices for the regional and global investment community with respect to supporting sustainable development. The Policy Forum could be facilitated by the Zambezi Valley Resource-Based Development Coordinator, with the support of international partners, such as the VCC, to facilitate preparation, effective discussions, and dissemination of outcomes.

Thus, the final recommendation of this report is to create a process for implementation of a holistic resource-based strategy, as outlined in this report, by supporting the establishment of a Coordinator, Advisory Group and Policy Forum.

Resource-based development is challenging, but the opportunities to leverage the resources for sustainable, inclusive growth are substantial and within reach. Recognizing the opportunities and including them in a widely-supported resource-based development plan will create a platform for Mozambique's partners to pool resources and activities to support the government to achieve meaningful and sustained benefits from its resources.