

MANAGING NATURAL RESOURCES FOR SUSTAINABLE GROWTH AND HUMAN DEVELOPMENT IN TANZANIA - THE CASE OF EXTRACTIVE INDUSTRY

By: Dr. Razack Lokina & Prof. Anthony Leiman

THDR 2014: Background Paper No. 6
ESRF Discussion Paper 57



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List of Abbreviations

BG Tanzania	British Gas Tanzania
CCTV	Closed-circuit television
EMAA	Emergency Mutual Assistance Agreement
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GoT	Government of Tanzania
IFC	International Finance Corporation
IMF	International Monetary Fund
IMO	International Maritime Organization
LIC	Least Industrial Countries
MEM	Ministry of Energy and Minerals
MIC	Middle Income Countries
MRSF	Mineral Revenue Stabilization Fund
NEMC	National Environmental Management Council
NGV	Natural Gas Vehicles
OSRL	Oil Spill Response Limited
PSA	Production Sharing Agreement
TcF	Trillion Cubic Feet
TEITI	Tanzania Extractive Industries Transparency Initiative
TMAA	Tanzania Mineral Audit Authority
TPA	Tanzania Port Authority
TPDC	Tanzania Petroleum Development Corporation
TVET	Technical Vocation Educational Training
UNDP	United Nation Development Programme
URT	United Republic of Tanzania
USA	United State of America
USD	United States Dollar
VAT	Value Added Tax
ZCCM	Zambia Consolidated Copper Mines

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1. Background

1.1 The History of Mining in the Tanzanian Economy

Since 2000, mining has been the fastest growing sector in Tanzania with an average annual growth rate of about 15%, the largest recipient of foreign investment, and the largest contributor to the country's exports (accounting for 48.2% of Tanzania's total merchandise exports in 2006, and about 45% in 2011). Tanzania's mineral sector has been broadening its base and expanding its size in recent years, with gold, natural gas, limestone (for quarried for the production of cement), nickel, gemstones (particularly tanzanite and diamonds), and uranium being the major contributors.¹ However, nearly all major developments over the past decade have been seen in the gold sub-sector, making gold the most important mineral in Tanzania. Proven gold reserves are currently in excess of 1,000 tonnes², making Tanzania Africa's third-largest gold-producing country after South Africa and Ghana. Importantly little value can be added locally once basic refining has been performed, and the margins available to gold middlemen are thin. The impacts of this sector are therefore restricted to the direct earnings of those extracting the mineral. By contrast quarried limestone is locally beneficiated into cement, making it a product automatically at the base of an important local value chain.

Tanzania aims to become a Middle-Income Country (MIC) by 2025 and has articulated a strategy on how to achieve these targets through its National Development Vision 2025. The Vision foresees the mineral sector contributing approximately 10% of national GDP by 2025. In recent years its growth has outpaced that in the rest of the economy. Mineral sectoral growth in 2012 was 7.8% compared to real GDP growth of 2.8% in 2011. Its contribution to the national economy was 3.5% in 2012 compared to 3.3% in 2011, using 2012 prices. The value of mineral export sales increased from USD 1.98 billion (equivalent to TZs 3.2 trillion) in 2011 to USD 2.3 billion (equivalent to TZs 3.7 trillion) in 2012. This is equal to an increase of export revenue of 16.3% between 2011 and 2012. Much of the revenue growth is attributable to the increase of gold prices in the world market from the average price of USD 1,571.28 per ounce in 2011 to USD 1,668.63 per ounce in 2012. Gold is the single largest mineral commodity contributor to sales exports, forming 94% of total mineral exports in 2012. Table 1 summarizes key economic indicators from 2007-2012.

¹ In the national statistics it features as mining and quarrying. Importantly, this sector account excludes the extraction of 'other non-renewable resources' including natural gas.

² See webpage: <http://www.infoMine.com>

Table 1: Mineral sector's contribution to the National Economy

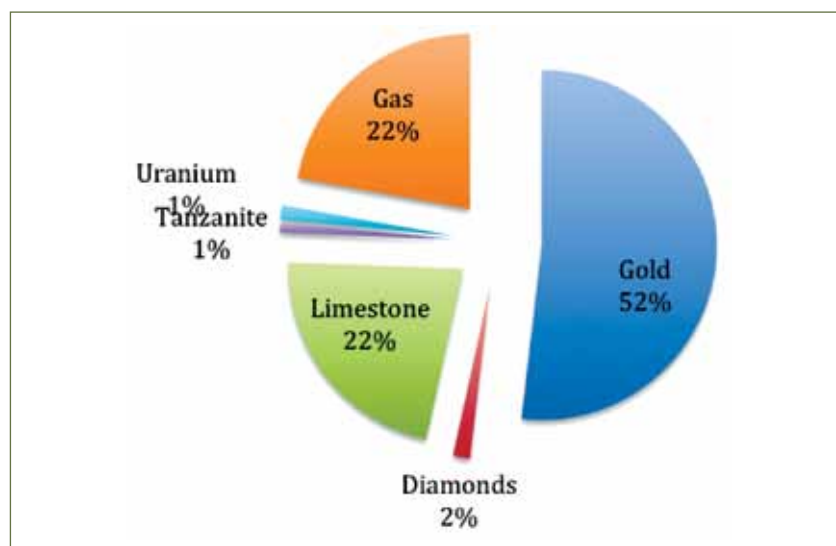
	Actual					
Indicators (as % of GDP)	2007	2008	2009	2010	2011	2012
Exports (GNFS)	24	25	23	28	31	31
Imports (GNFS)??	41	39	35	39	50	48
Govt. current revenue??	13.1	14.7	15.2	14.9	15.3	16.1
Growth rates ¹¹						
GDP annual growth rate	7.1	7.4	6.0	7.0	6.4	6.5
GDP per Capita growth	4.2	4.4	3.0	3.9	3.3	3.3
GDP (US\$ (Million) at current prices)	16,826	20,715	21,368	22,901	24,665	28,421

Source: World Bank (2013)

The immediate challenge presented by the sector is that tax breaks designed as foreign direct investment incentives for the mineral sector, together with common tax-evasion through practices such as under-invoicing, mean that mining firms' payments of company tax have been insignificant. Over the past decade state revenue from the minerals sector has mainly been from royalties and taxes on wages. TEITI Reports indicate government's total receipts of company tax were TzS 1.4 billion and 27.7 billion or 2.1% and 7% of total receipts for the 1st and 2nd report respectively of 2011/12.

The other major product, natural gas, could go in either direction, and for this reason will be a focus of this report. In recent years natural gas exploration and production has been expanding rapidly. New discoveries, and gas's potential linkages to the remainder of the economy, are likely to make it increasingly important. Figure 1 summarizes the reported receipts by commodities.

Figure 1: Reported Receipts by commodity as of 2011/2012



1.2 The Status, challenges and Prospects of the Tanzania natural Gas Sector

Tanzania's estimated onshore and offshore natural gas reserves now exceed 43TCF, and are expected to rise significantly with future exploration. However, proven reserves are far smaller. The first discovery of natural gas in Tanzania in volumes of commercial significance was made in 1974

during exploratory drilling; the subsequent appraisal at Songo-songo in Lindi Region estimated the resource at 1 – 2.5tcf in 1982. Further discoveries, estimated at 3 – 5tcf, were made at Mnazi Bay in Mtwara Region. However, the proven reserves at the production wells of Songo-songo and Mnazi Bay, are only 880bcf and 262bcf, and these produce limited fuel supplies primarily for power generation and industrial users. Major explorations began to take place during 2000s³. Currently, Tanzania has more than a dozen onshore/shallow water discovery and production wells with total resource estimate of up to 7.95tcf. A further 32 tcf has been discovered offshore as of March, 2013. However, largely due to infrastructural constraints, the domestic market remains weak, and off-take, both upstream and downstream developments linked to the existing gas reserves so far remains modest both in terms of the direct impact, as well as the indirect impact with overall positive contribution to the economy.

Ideally, the anticipated expansion in gas production will create new and significant growth, fundamentally altering the structure of the economy. For the exploitation of natural gas to provide a major stimulus to the economy, however, the requisite linkages will need to be formed between these gas funds and the economy as a whole. State planners are aware of the issue and Government is currently developing policies to provide guidance on upstream, and midstream, gas-related activities. These include a Natural Gas Utilization Master Plan to identify investment options and ways of maximizing the value of natural gas utilization.

This leads to the issue of licencing and private/public partnerships. While the design of the licencing system is clearly important, the history of Tanzania's parastatals clearly shows that the achievement of transparency and probity in their management will be the major challenges. These will need to be met if returns are not to be diverted by local rent seekers.

It has been suggested that the threat of a 'resource curse' is best countered by maximizing the gains along local value chains. While this may be important, the real solution, we argue, is most immediately met by regular and impartial audits, whose results are reported publically.

The production of gas sector in Tanzania is currently managed by Production Sharing Agreement (PSA), whereas the Tanzania Petroleum Development Corporation (TPDC) is granted licences under the Act by the Ministry of Energy and Minerals, mandating TPDC to enter into PSAs with oil and gas companies on behalf of the government. The Act also provides for exploration, appraisal, development and production periods. Under the current process, if a discovery is developed to production and sale under PSA, then the investor is allocated a portion of the revenue (cost oil/gas) to recover own costs. The remaining portion of revenues (profit oil/gas) is shared between the investor and the government. The agreements also provide for the government to participate in the development of the resources (state participation) through the TPDC once commercial quantities are confirmed.

State participation at the development stage of resource extraction is prudent because the government is entitled a portion of a net cash flow (dividends, based on state participation percentages) over the life of the project. Therefore, total government take from the PSA is optimized as the percentage of net cash flow is collected as dividend in addition to royalties, profit oil/gas share, corporate tax, other direct and indirect taxes. Under the current PSA, the government has refrained from state participation at the exploration level due to the high risks involved, lack of expertise, and because of limited public finance as oil and gas exploration is capital intensive.

³ As a rule of thumb, at current prices fields larger than 1tcf are generally viable, even if the gas is in tight rock formations.

This system is based on shared profits, and prototype set of PSA rates exists, (Table 2 provides illustration of the PSA model):

Table 2: Model PSA for Natural Gas suggested terms

Tranches of daily total Production rates in each of the Contract Areas (MMscf per Day)		TPDC Share of Profit Gas	Contractor Share of Profit Gas
0	249.999	50	50
250	499.999	55	45
500	749.999	60	40
750	999.999	65	35
1000	1249.999	70	30
1250	1499.999	75	25
1500	Above 1500	80	20

In other words, the contractor’s share of profits in a large (and consequently profitable) field will be smaller than it would be in a smaller, lower yielding, and hence less profitable field. It recently became clear, however, when details of contracts with Statoil and Exxon were leaked, that actual rates in PSA were differing markedly from those in the provisional model, and that these figures were not being publically disclosed.⁴ Once again, maximization of rents will not depend so much on the location of the value chain as on transparency in its management.

Sustainable development in the natural resources sector requires the efficient transformation of natural capital (i.e. gas reserves) into other forms of productive capital that underpin sustainable long-run growth, be they physical capital, such as infrastructure, or human capital such as health and education. To achieve it, however, natural resource rents first have to be locally captured. Again simple transparent contracts, monitored and routinely audited, and enforced with probity, are a prerequisite.

As of December, 2013 a total of 26 PSAs covering onshore and offshore blocks had been signed between the Government and 18 companies. As of October 2013 there are 11 discoveries--3 onshore and 8 in deep sea--63 wells have been drilled, whereas 53 wells are onshore and 9 wells are offshore. The drilling of wells was as follows: BG (Blocks 1, 2, 3), Statoil (Block 2) and Petrobras (Block 5). The drilling led to significant gas discoveries in blocks 1, 2, 3 and 4.

The current production of gas is based on small discoveries at SongoSongo Island in Kilwa, Lindi region (250 km South of Dar es Salaam) and at Mnazi Bay in Mtwara region (450 km South of Dar es Salaam). There are other small discoveries in Mkuranga, Coast region (60 km South of Dar es Salaam) and Kiliwani North (2.5 km South East of SongoSongo Island). Taken together, SongoSongo, Mnazi Bay, Mkuranga and Kiliwani North have a total of approximately 8 TCF. The third TEITI reconciliation report (June 2011) indicated that this was equivalent to 1.5 billion barrels of oil, but did not indicate whether this equivalence was simply thermal or in terms of the amount of liquid fuel that would be obtained at a GTL plant.

Representatives of major stakeholders in the gas sector were interviewed. Most anticipate further discoveries, both offshore and onshore. BG Tanzania, with their partner Ophir, have made nine

⁴ Indeed the reported PSA profit shares accruing to foreign oil majors have gone as high as a maximum of 80% and a minimum of 50%

discoveries of natural gas across deep water Blocks 1, 3, and 4 as of October 2013, and estimate their gross recoverable resource at roughly 15 trillion cubic feet. Statoil with their partner Exxon Mobil, have also made deep-water discoveries in Block 2. In addition to the deep-water discoveries, there are a number of onshore and shallow offshore discoveries two of which, SongoSongo (c. 105 mmscf/d) and Mnazi Bay (c. 5 mmscf/d) are currently producing gas for the local market. In August 2013, TPDC announced an estimate of 200 tcf of gas across Tanzania.

1.2.1 Operational scale and remittance of rents

In October 2013 the government announced a new round of Deep Offshore Licencing. This, together with the approval of the Natural Gas Policy in October 2013, suggests that there will be continued investment in the gas sector by the 23 international oil and gas companies currently active in Tanzania and others might join the gas sector. Tanzania's Natural Gas policy, aimed to ensure that the benefits of the resource would improve the socio-economic well-being of Tanzanians. The policy tries to meet a range of different objectives, such as bringing a balance between domestic and exported natural gas industry, and between domestic and foreign investment. It also reflects the lessons of countries, which have experienced difficulties in the effective management of their resources.

This brings up the issue of linkages between mining and the remainder of the economy. Although small scale and artisanal operators are labour intensive and closely tied to the domestic economy for their inputs, larger scale operations may be far more capital intensive, their ownership foreign and linkages more tenuous.

The implications of size and choice of technique may be profound in other ways. In the case of small-scale local operations almost all of the revenue earned accrues locally. Only when the product is sold illicitly out of the country do any of the profits cross the border, and even then the margins on illegal broking are typically small. Larger scale operations, however, especially those run by multi-national firms, appear to remit much of their profit, and to source many of their inputs from abroad (indeed the two issues may be tied). This does not mean that there is no role for large multi-national operations, there are deep level operations that local enterprises cannot exploit due to lack of skills and capital. It does mean, however, that the state should not seek to displace informal miners and replace them with foreign majors on the grounds that formal operations will contribute more to the economy.

Tanzania's mining sector has been characterised by structural weaknesses in the country, and by poor linkages between the industry and other economic and social activities. Its characteristics are those of an enclave in which the bulk of inputs are imported and output is exported without much processing, earnings do not enter the national economy except for operational needs; and the most important skilled jobs are done by expatriate labour while nationals are excluded from the ownership of assets. Further weaknesses manifest themselves in poorly negotiated mineral concessions with fiscal terms that are sub-optimal and do not maximize the net present value of mineral investment. While stakeholder participation in the value chain is weak; the regulation and management of environmental and social impacts are especially weak, and a large power asymmetry does not make for equity in the distribution of benefits to stakeholders. Clearly, such an industry cannot underpin the country's economic and a social transformation required.

With the discovery of new reserves of gas, it is important that the sector facilitate broader economic

and social linkages, including infrastructure development, cluster formation and industrialization. Looking at governance, human rights, and social issues – including enhancing stakeholder participation along the mining value chain; the institutional and policy space for mineral sector should be made to contribute to economic and social transformation in the country. And finally, environmental, social and material stewardship issues – The management of environmental and social sustainability through judicious impact assessments and prudent material stewardship should be given a priority.

Even if this is achieved, a number of challenges will remain. These range from the instability of the revenues, destabilizing savings in public expenditure, real exchange rate appreciation, volatility of commodities, to unknowable path of future trend of commodities price. In order to effectively address these challenges an effective policy framework is needed. Also required are strategies for implementation, monitoring and evaluation. The preparedness package includes ensuring:

- a fiscal regime able to capture mineral rents is in place;
- that requisite human resources are made available and developed,
- that savings are invested in the domestic economy,
- that ownership is on joint-venture basis to encourage high retention rates in the domestic economy,
- that development of industries is encouraged (value-addition),
- that transparent and consultative contract negotiation capacities are strengthened so that the negotiation processes provide benefits to the local community from the resource, while the investment in other non-gas sectors (e.g. agriculture and manufacturing) is scaled-up.

An issue raised was that merely finding gas is not in itself sufficient. The gas fields have to be developed and the product sold for the resource to be effectively monetized. Many of the wells are located at water depths of 1500 metres or more and up to a further 2000 metres under the sea bed and in locations 30-80 kilometers offshore. Such deep water natural gas is costly to extract. To be viable it requires that the gas be liquefied and exported, capturing international prices, to underpin the development. It is argued that a stable investment climate is therefore more important to industry growth than are further discoveries.

To bring the resource to the surface, the sector requires both considerable capital investments, and skilled human capital. Tanzania as a country lacks both the financial capacity and the human resources to fully engage in gas extraction, hence the need for FDIs. Apart from the information asymmetries, several governance problems are associated with the ownership operations of the international corporations. The presence of off-shore registered companies in the ownership chain limits public disclosure requirements. Meanwhile, the involvement of subsidiaries and affiliates as conduits for intra-economy trade creates extensive opportunities for trade mispricing, aggressive tax planning and evasion, thus enabling companies to maximize their profits while encouraging illicit capital flight (EAC, 2011). For Tanzania to fully benefit from the gas economy concerted efforts are needed to make sure that the challenges associated with the operation of foreign companies are minimized.

It is not clear that following the lead of Norway, and establishing a state owned company to exploit the country's hydrocarbons, would be a solution. The possibility of problems such as those mentioned above, induced Norway to establish its own state oil company after the discovery of North Sea oil and gas. However Tanzania and Norway are fundamentally different. While the Norwegian hydrocarbons sector is owned and operated by a state owned corporation, the country

has sufficient human skills to manage it, has a culture of transparency and accountability, and had a number of other historically well performing national companies.

Tanzania presently lacks the critical mass of infrastructure, service industries and skills required to meet the demands of the gas sector. Also the past history of poor performance of national companies also raises more questions than answer on the ability of Tanzania to run effectively oil and gas companies. If any sort of local value chain is to be achieved these problems need to be overcome.

The historically demonstrated risk is that import substitution will lead to rent seeking and the distortion of the local economy. Tanzania is only now recovering from the ISI policies of the immediate post-independence era and any suggestion that protection of local enterprises should be used to maximize local value added, should be actively resisted.

Despite these risks there is merit in promoting local content. Tanzania's large scale miners have typically met short-term cost pressures by hiring personnel and procuring goods and services from abroad. The result was a dependence on international supply chains, with little cultivation of local skills and industry.

If local value chains are to be cultivated, without distorting the economy, a number of points have to be recognized. One is that developing the skills required by the oil and gas sector is possible, but requires time. It also requires government to foster an enabling business climate, not through protection but by guaranteeing property rights, minimizing red tape, and offering tax breaks for support of training and education, including apprenticeships. Lastly, the state can support development projects that lower the costs economic diversification (e.g. securing reliable access to energy, efficient infrastructure etc. Again it is stressed that this is not a call for subsidies.

A good example is BG Tanzania, which is working to promote local supply chains and to enhance employment opportunities. The company has been managing Mtwara Port on behalf of the Tanzanian Ports Authority (TPA) and other international oil and gas companies, to support offshore exploration and appraisal. Between 2011 and 2013, US\$40.5m was invested in port facilities to upgrade them to international standards. This involves working with their existing construction contractors, providers of security CCTV systems, and construction management and engineering design, to help them fill gaps, for example, Tanzanian companies have shown a strong commitment to improving safety health and environment practices if the appropriate training and education is provided. The number of Tanzanians working on-site has increased from 50 in 2009 to over 500 in 2013.

The re-development of Mtwara Port included the cultivation of links in a local supply chain. Instead of sourcing industry-standard high specification security fencing from a South African company, which was the only available contractor, BG Tanzania awarded the US\$550,000 contract to a Tanzanian company, and worked with them to produce an industry compliant and approved design, which is now available for future projects in the country. Of the US\$40.5m total investment, US\$31.8m was awarded to Tanzanian registered companies. It is believed that other companies award many more local contractors as well.

Given Tanzania's skills shortage, the role of the State in expanding education and training will necessarily be central to the development of local value chains. Publicly available assessments of

Tanzania's education sector suggest that it is currently incapable of supplying the secondary and tertiary training needed to meet the employment opportunities in the evolving gas sector⁵. Key observations include the following:

- While enrolment in primary education is high (97.8%) and has improved significantly, there remain serious challenges around the quality of education, in particular in mathematics and the sciences. English language proficiency levels are also comparatively low. This limits the base cohort of individuals who could pick up semi-skilled or skilled employment opportunities.
- There are high drop-out rates at the post-primary level and there are serious accessibility challenges, particularly outside urban centres. Of each 100 students who enter primary school, only about 55 continue with secondary education and only about 23 will complete lower secondary education. These figures are understood to include those who have entered vocational technical education after completing primary education. This limits the pool of individuals who could pursue employment opportunities related to certified trades and crafts.
- Only about 5% students are able to proceed to upper secondary education and only about 3% of students with primary education will complete secondary education. Only about 335 out of every 100,000 Tanzanian adult population complete some form of higher education. By implication, the pipeline of individuals who could take up employment opportunities requiring advanced technical training and Higher Education is extremely thin.
- Despite the country's high needs in this area, only 250 out of 100,000 Tanzanians have completed technical vocational education and training (TVET). TVET graduates have very good employment opportunities, but there is a very severe shortage of places. The Minister of Education has suggested that at present only 1 in 8 TVET applicants can get a place. The demand would be even greater if accessibility outside urban areas were improved.
- To meet the needs of a 'new gas economy', the TVET institutions will need to train students to international standards, including international safety standards. In 2012 BG-Tanzania provided US\$ 1m for the period of three years to sponsor Tanzanians undertaking professional training related to the gas and oil sector. Currently, about 300 students are sponsored by the MEM at higher level learning institutions both within Tanzania and abroad.

A skills gap analysis was commissioned by the Government for the current Five Year Development Plan. It recognized that, for the country to meet skilled labour demand and pave the way to middle-income status, it would need to double the annual intake of higher education students by 2015 (See Box 1).⁶ It would also need to be more than double the number of students in the vocational education and training system each year. It would also need to quadruple the number of teachers employed in those vocational training centres. Despite their disturbing size, these estimates had not factored in the requirements of the emerging natural gas sector.

⁵ UNESCO/GOT, 2012, Education Sector Analysis

⁶ International Growth Centre, LSE, January 2012, Attaining Middle Income Status – Tanzania.

Box 1: BG Tanzania

Five Year Plan operational targets for 2015: (i) Provision of scholarships for targeted skills (development of natural gas, uranium, iron and steel and petroleum); (ii) To increase the share of highly qualified working population from 2.7% to 4.3%; (ii) Facilities at Dodoma University to be completed; and (iii) 5 higher learning institutions rehabilitated and expanded.

This component supports institutional capacity building for one or more Tanzanian universities, to develop expertise in oil and gas related disciplines and provide opportunities to high potential students to qualify in engineering and other related fields. Projects will cover the following:

- Provision of international scholarships for targeted graduate and post-graduate studies.
- Provision of national scholarships for targeted graduate and postgraduate studies.
- Support to enhancing the capacity of targeted higher education institution(s) to strengthen and improve the quality of existing technical/engineering programs (e.g. curricula support, teacher training, facilities and equipment e.t.c).

To date, this component has included a pilot project with the British Council providing two scholarships per year for sector related postgraduate studies in the UK. It has also included the provision of technical equipment to the Universities of Dodoma and Dar-es-Salaam, physical expansion of classroom facilities at the Minerals Resources Institute, and the provision of four national scholarships for students at the Nelson Mandela Institute.

BG Tanzania's capacity development program¹ is focussed on:

Tertiary level:

- support Higher Educational Institutions in Tanzania
- provide individual scholarship opportunities
- bring programs to international standards

Vocational training:

- target Tanzania Vocational Education and Training (TVET) qualifications to meet international occupational standards
- address TVET systemic challenges

School leavers:

- educational attainment of post-primary students (STEM, English language)
- after-school/ summer school STEM projects
- talent identification, progression, mentoring.

1.3 Challenges Facing the Oil and Gas Sector

A number of key stakeholders were consulted in the course of drafting this report. They categorised the most pressing challenges in the sectors as follows:

(a) Investment climate

Gas production is a long term business that demands large initial investments of capital. For this reason the majority of respondents indicated that a stable and predictable investment climate is crucial for the gas sector to prosper. Such a climate has a range of components. The first is respect for contracts and property rights. In this regard it was acknowledged that the Government of Tanzania has confirmed that existing production sharing agreements will be respected. A report by McKinsey⁷ noted that the many successful approaches employed by resource-driven economies

⁷ Reverse the curse: Maximizing the potential of resource-driven economies, McKinsey Global Institute, December 2013

typically included robust fiscal policy and competitiveness.

The concern with investment climate is not only important to foreign investors. An analysis of five Afrobarometer public attitude surveys, found that East African citizens shared three priorities: jobs, income and infrastructure⁸. Jobs seen as the pathway out of poverty⁹ are created by the private sector. An analysis¹⁰ of constraints that prevent the private sector from growing and generating good-quality jobs found that the investment climate, particularly relating to business regulation, was the most pressing factor (46%), followed by infrastructure (17%) and access to finance (16%).

Minimizing the red-tape confronting businesses, and making it easier to open one, is also important. Interviewed stakeholders suggested that formalising a business is a precondition to supplying goods and services directly to the oil and gas industry with its rigorous safety, health, environment and social standards. The government of Tanzania and donors can help build an environment where obstacles to the formalization and operation of a business are minimized.

(b) Government policy and regulations

These are major drivers of the cost of doing business. Respondents indicated an awareness that some contribution had been made through the 2013 Natural Gas Policy, which attempted to introduce a clear and coherent framework for the government and industry to work together. Nonetheless, the cost of doing business remains a concern. One indicator of this is the country's declining standing on World Bank's index of the cost of doing business (See <http://www.doingbusiness.org/reports/regional-reports/east-african-community>).

(c) Governance issues

One objective of the Natural Gas Policy is ensuring that all Tanzanians benefit from the resource. It was recognized by respondents that achieving this will present challenges to governance. One reason is that responsibility for compliance is not narrowly focussed. The Policy has 17 specific objectives that range from investing the proceeds wisely, through to environment and sustainability, and to transparency and accountability. The breadth of these issues means that the responsibility for them falls across many government ministries and regulatory agencies. Recent work by the UONGOZI Institute and Oxford Policy Management point to several governance priorities: managing expectations; exchange rate management; competitiveness; inclusive growth; fiscal management; 'Investing in investing'; and, during LNG project construction phase, skill formation, and during the LNG operating phase, the supply chain.

The key problem is clearly identifying those responsible and ensuring that accountability is clearly required of them. Overlapping responsibilities and confusion of management roles could prove critical flaws.

1.3.1 Linkages with other sectors of the economy

For participants in the gas sector, the final investment decision, when it is made, is the culmination of a lengthy process, involves both technical feasibility (will it be possible, safely and efficiently,

⁸ Is Anyone Listening? Does US Foreign Assistance Target People's Top Priorities? - Working Paper 348 December, 2013, Ben Leo, Center for Global Development

⁹ World Development Report 2013: Jobs, World Bank, 2012

¹⁰ IFC Jobs Study: Assessing Private Sector Contributions to Job Creation and Poverty Reduction, Jan 2013

to build all the facilities needed); and commercial feasibility (will the projects expected revenues cover the expected costs of investment and operations, pay royalties, profit shares, and taxes, and still make a return on capital for shareholders). Some companies indicated that the delay between discovering gas and making a final investment decision is between 2 and 4 years. Thereafter construction takes 4–6 years. There are some projects, which are reasonably far advanced, however, or where the delays are far shorter, e.g. where gas will be for local consumption in particular generation of electricity. Respondents mentioned that such projects may be on-stream by 2015.

Looking ahead, there will be significant opportunities to enhance linkages and diversify the Tanzanian economy. For example:

Gas can be utilised in different ways and could therefore impact other sectors, which in a way contribute to human development. Chief among the sectors include:

- LNG for export: Depending on the terms and transparency of the PSA, this could be a material source of revenues for the Government of Tanzania. The flow of rents could be invested in national infrastructure or as capital for investment in other sectors e.g:
 - o Construction of power generation plants and electrical transmission and distribution networks.
 - o Construction of gas transportation and distribution infrastructure (gas processing plants and pipelines)
 - o Capital investment in fertiliser production and agriculture development.
 - o Capital investment for development of national transportation infrastructure (ports, airports, railways and roads)
 - o Capital investment for development of industrial parks.
 - o Investment in the education system (schools, technical vocational training centres, universities)
- Gas as fuel for electricity generation: scarcity of power has been a bottleneck for economic growth throughout East Africa. All sectors could benefit from cheap and more reliable/additional power.
- Gas as feedstock for fertilisers: this would particularly benefit the agricultural sector which employs almost 80% of the country's work force and accounts for roughly 20% of the GDP
- Gas used in industries as fuel
- Gas used in directly in the residential and commercial sectors, and as fuel in Natural Gas Vehicles (NGV).

1.3.2 The nature and magnitude of the challenges facing extraction activity

The design of an appropriate system of taxation and charges for those engaging in mineral or gas extraction is clearly a challenge. Pure theory suggests that, in a competitive market, abundant minerals such as iron ore, limestone, coal or bauxite, would not earn abnormal profits (so called Hotelling rents) and should be taxed in the same way as any firm in the remainder of the economy. The challenge comes in designing taxes and charges for those scarce and high value minerals that do command Hotelling rents. In the Tanzanian case these include gold, natural gas diamonds and tanzanite.

However, the simple administration of a tax system imposes real challenges. Interviews with firms in the industry revealed a number of concerns, which could be addressed by those who design taxes. Among these were; accounting for exchange rate fluctuations, import exemptions, the use of withholding tax, VAT relief on exploration and development, and VAT legislation. Table 3 summaries

the details of the issues identified by the oil and gas companies interviewed.

Table 3: Summary of the nature of challenges facing extraction industry

		Challenges
	Taxation Issue	Taxation implications
1.	Foreign currency accounting	Most PSAs permit upstream oil and gas companies to use United States Dollars as the unit of account in keeping their accounting books and in calculating taxable income. However, these firms also have to prepare financial statements in local currency if the TRA refuses to accept tax calculations and returns in US dollars. This exposes the upstream oil and gas companies to foreign exchange rate fluctuations as well as conflicting with the requirement to prepare financial statements in the functional currency of the entity.
2.	Import exemption: extension to subcontractors	Import exemptions are not shared symmetrically between oil and gas firms themselves, and the sub-contractors who are bringing in materials and equipment to serve them. The practice of consigning subcontractor equipment in the name of the upstream oil and gas customer exposes the upstream customers to some tax risks. The exemptions extended to imports of the upstream oil and gas companies are presently restricted to import duty and VAT at importation. Excise duty, fuel levy and the customs processing fees amounting to 0.6% of the FOB value of the consignment are presently not covered in the exemptions provided to the imports by the upstream. If the upstream oil and gas companies do not cede some of their exemptions to their subcontractors but leave them to import goods in their own name, there will be an incremental cost borne by the oil companies considering that their subcontractors will include the taxes incurred at importation in their billings.
3.	Withholding tax on payments for services provided outside Tanzania	There is uncertainty regarding the application and reach of withholding tax on service payments which is disrupting the projection and planning of the upstream oil and gas projects. While this was pointed out as a challenge by stakeholders interviewed (oil and Gas companies) it should be emphasised that it should not be seen as a problem since when foreign consultants/expert labour are employed with-holding tax should be paid. It is subtracted from the earnings of that person. It is a way of ensuring foreign companies do not minimize their tax contribution to the Tanzanian fiscus by employing foreign consultants and or by buying inputs from their affiliated companies themselves at inflated prices.
4.	VAT relief on exploration and development costs	The current administrative process of approving VAT reliefs is cumbersome and may not cope well with high volumes of transactions. As the country gears towards appraisal activities to determine whether the recent hydrocarbon discoveries are commercially viable or not, the Government ought to consider extending the VAT relief to development and production activities. VAT is meant for activities that add value to exploration is an activity intended to test for resources and not to produce a product. That will be done later once the resource is found. If much of the exploration finds nothing, it may be inappropriate to tax the expenses involved using VAT. So it is not expected VAT relief to be extended in the production stage. It should be emphasised here however that VAT relief is always a controversial and can cause serious distortions in an economy. It is to be noted that these firms are already getting serious tax breaks.

5.	Draft VAT legislation	The aim to simplify the tax system and encouraging compliance are commendable and there are positive provisions in the draft legislation that will stimulate the growth of the Tanzanian economy.
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1.3.3 Environmental challenges tied to mineral extraction.

It is well known that Mining poses serious environmental risks. The production arrangement is governed by a Production Sharing Agreement (PSA) in the form of a Public/Private-Partnership for natural gas exploitation in Tanzania. In this arrangement, the Government retains ownership of the natural gas and hence the property rights governing the resources. This not only entails, the sharing of such costs and benefits as ensue from natural gas exploitation, but also sharing in the responsibility for managing the unavoidable environmental risks. The Private Sector participant is, however, both Investor and Operator.

It is important to note that the Oil and Gas companies who sign such a PSA may outsource or contract out all or any of the operations and related supportive services of the gas or oil fields. Thus, passing on the environment management responsibility and partial liability to their subcontractors who are not direct parties to the PSA. Since their contracts are of smaller size and shorter duration than those of the principals in the agreement, such subcontractors may not have the same incentive to control environment pollution.

Recent experience in managing the environmental impacts of mining in the Lake Zone point to Tanzania's lack of institutional capacity in the policing of operations with potential ecological impacts. This problem is compounded by the fact that the gas sector will be a new and important sector of the economy in terms of both revenues and employment, and this may induce undue leniency in the legal enforcement of environmental regulations. This is an area, which will require attention from the government, the media and civil society.

Both the State and the oil and gas industry are clearly aware of the potential for environmental damage in the course of drilling, extraction and processing (See Box 2). Both have been proactive in the development of management systems, operational practices and engineering technology targeted at minimizing environmental impact, and this has significantly reduced the number of environmental incidents. See for example, Box 2, which details the activities BG-Tanzania's activities in respect of environmental damage related to oil and gas activities.

Box 2: BG Tanzania: A case Study

BG Tanzania is a British company that has invested heavily in natural gas exploration in Tanzania. In addressing the challenges facing the exploration and appraisal of oil and gas in Tanzania, BG Tanzania has undertaken the following:

- BG Tanzania facilitated an introductory workshop in September 2011 on International Finance Cooperation (IFC) Performance Standards training in Dar es Salaam and was attended by various stakeholders including the Government institutions. The IFC Performance Standards are internationally recognised standards on the identification, recognition and management of the environmental and social risks. The Equator Principles are based on these standards.
- BG Tanzania has built oil spill response capability in Tanzania by providing Oil Spill Response Training (IMO level 1 Accredited) to staff from the National Environmental Management Council (NEMC), the Mnazi bay Marine Park (Park rangers and fishermen) and Tanzania Ports Authority (TPA) to build capacity to respond and protect sensitive shoreline clean up in case there is an Oil spill. In addition BG Tanzania has also stationed an Oil Spill Response kit at Mnazi Bay Marine Park for use in protecting the sensitive Marine Park shoreline in the event of an oil spill.
- BG Group is a founding member of Oil Spill Response Limited (OSRL), a non for profit organisation supporting the oil and gas industry with oil spill response. OSRL are the recognised experts in this highly specialised service, and are providing the same services to BG Tanzania.
- BG Tanzania and Statoil Tanzania AS have executed an Emergency Mutual Assistance Agreement (“EMAA”) under which BG and Statoil agree to share, if reasonably able to do so, such resources as drilling rigs, support vessels, tangible materials, consumables and technical personnel, in the event of an emergency in connection with well operations in the Indian Ocean offshore of Tanzania.

Source: BG Tanzania-2013

2. The Country Policy environment

Although Tanzania has free market economic policies, and has lifted foreign currency controls, the government retains control in certain key sectors, among which are energy, railways and harbours. This is particularly important as the lack of reliable electric power and water supplies, and inadequate infrastructure systems, especially road networks, were among the major issues cited as concerns by interviewees from the gas and mining sectors. The absence of significant private sector involvement in the energy, railways and harbours sectors is seen as the major reasons for its under-performance. These deficiencies were seen as major barriers to economic growth that raised the cost of doing business in the country.

If properly managed, gas and hard-rock mining can be major contributors to government revenues. In consequence good macroeconomic management is one of the most important factors in maximising the benefits and mitigating the negative impacts of the resource sector on economic development. In particular, mining and gas-based revenues can distort relative prices and the Rate of Exchange, and so lead to an inefficient use of the nation's other resources. High-quality fiscal and macroeconomic management can mitigate or avoid these undesirable results.

The post-independence emphasis on state control of industry caused significant distortions in the economy, and opened avenues for rent-seeking and corruption. However, Tanzania's macroeconomic management improved in the 1990s. The government's commitment to reform, its emphasis on fiscal discipline, and significant inflows of development assistance, has helped to achieve a long period of macroeconomic stability. Since the mid-1990s, Tanzania has largely experienced growth rates of around 6% per annum, and inflation has dropped from double-digit figures to low and stable rates. However, the November 2013 IMF Assessment noted that the current fiscal deficit is in excess of the agreed fiscal deficit target of 5 percent of GDP, by about 1 percent of GDP. The new Natural Gas Policy sets priorities, providing for the creation of an independent regulator and the establishment of a Gas Revenue Fund-wealth fund.

One of the concerns of the regulator should be the management of public expectations. Gas discoveries have been associated with very high expectation among the local communities, particularly in the southern region, and the nation at large. If these expectations are poorly handled, the resulting ill-informed pressure can lead to wasteful spending. It is clear that local communities have not directly benefitted from rents accrued in the mineral sector in the Lake Zone, and this has led to levels of local discontent.

The regulator's more immediate priority is ensuring that the revenue from the resource is contributing to national development. The focus of discussion has been around the establishment of the Tanzania Sovereign Wealth Fund due to begin in late 2014. The Fund's aims will be, to promote linkages between gas extraction and the domestic economy, and to ensure that projects comply with generally accepted international standards. Again, the success or failure of the fund will depend on the transparency of its operations and the accountability of its managers. The issue is central. Although the World Bank Worldwide Governance Indicators for Tanzania showed progression control of corruption between 1996 and 2006, it has been declining each year since

then¹¹. More positively, in December 2012, Tanzania became a compliant member of the Extractive Industries Transparency Initiative (EITI).

A final caveat remains, equity. The focus of concern has this far been on the efficiency with which rents are identified, maximized and appropriated, the gas sector's linkages to the local economy, and the cultivation of a domestic value chain. The extent to which benefits are shared equitably also has to be addressed. This is not a trivial concern as experiences elsewhere in Africa have shown.

The potential for development driven by resource revenues is huge; the value of such assets dwarfs any international aid such countries might otherwise receive: in 2008, Angola, ranked 162nd out of 177 in the UN's Human Development Index, yet it collected oil revenues twice as large as the total amount of international aid given to the world's 60 poorest countries.

Botswana has managed much of the decision chain well. Its GDP per person has increased from US\$3,500 in 1980 to US\$12,500 in 2010 (in constant 2005 dollars). However Botswana is also one of the most unequal countries in the world and suffers from one of the highest HIV/AIDS prevalence rates, while its economy is still left undiversified. Resource management challenges remain.

International Monetary Fund, "Botswana"

2.1 Ensuring inter-agency coordination

Tanzania needs a strong champion with the authority to act to ensure policy coherence for gas development. For gas to form the platform to diversify the economy and put Tanzania on a sustainable growth path, strong coordination across agencies and linkages across sectors need to be built. Broadening the debate to a wide range of stakeholders in the country, working across silos and ensuring policy coherence are essential. Effective development of gas requires consideration of fiscal issues, environmental issues, educational issues and more. For example, the environmental obligations placed upon oil companies must be harmonized with the GoT's broader environmental management goals and priorities, and should be enshrined in environmental law. Environmental legislation and regulations should adequately account for the environmental concerns that development of the gas sector will raise and decisions on the development of the gas sector must take into consideration environmental protection and conservation concerns. Similarly, local content and local training obligations placed on oil companies should be coordinated with national policy aimed at increasing the capacity to supply such local content and training obligations should be considered in light of the GoT's broader goals to increase skills and capacity that will be applicable beyond the gas sector and that can fuel the development of other sectors of the economy.

¹¹ <http://info.worldbank.org/governance/wgi/index.aspx#home>

An effective way to facilitate the kind of inter-agency or inter-ministerial coordination that gas development will require is to establish an inter-ministerial committee charged with such coordination. Such a committee can facilitate input from across ministries in the design of policy or drafting of legislation thus leading to better ideas; can facilitate the sharing of information, technical and otherwise, across the government, which can enable ministries and agencies to better take advantage of one another's strengths for accomplishing their respective goals and missions; can facilitate harmonization of policies across ministries; and can provide a forum for clarification of roles and responsibilities among ministries, thereby reducing conflict and competition among ministries over subject and policy areas (URT 2013).

3. Policy Challenges Posed by Mining's Expansion in LDCs

It is clear from the histories of the Dominions, (Australia, Canada, New Zealand and South Africa) and from the recent experiences of Norway and Botswana, that there need not be any such thing as a "resource curse". Mineral wealth is a bounty and there is no reason why a nation unexpectedly finding itself endowed with such wealth should not go on to grow and mature. The natural resources discovered can engender expansion of the economic base, rising wealth and, eventually, reduced dependence on primary products. Nonetheless, as Sachs and Warner (2001) observed, in recent decades many economies have demonstrated an inverse correlation between new discoveries of mineral wealth and national economic performance.

Some have ascribed this to the colonial histories of the countries involved. One version of the argument states that political institutions designed to facilitate the extraction of resources have led to poor economic performance (Acemoglu and Robinson 2001 and 2012). Since most countries apparently afflicted by the 'resource curse' had their origins as colonies, the apparent answer could be to change their socio-economic institutional foundations. The proposal appears trite, certainly it is no solution in itself; but if a culture of corruption and rent seeking can be laid at the door of colonialism, then it may have some merit. In the case of Tanzania the culture of corruption appears to have been more directly a consequence of its strategy of import substitution, and the rent seeking opportunities this engendered, than of the country's history as territory under League of Nations mandate or United Nations trust.

At any rate economic reform policies, "must circumvent vested interests that seek to capture economic policy and bend it to retain a disproportionate share of any rent" (Auty 1). There are certainly some mineral rich nations in which political reform has the potential to yield an improved economic performance

While this view may have merit elsewhere in the world, it is not clear that it is relevant to Tanzania. The country is a democracy with a well-established legal system; and while it was a German colony until the First World War, little of that history remains in the political system today. From 1919 until independence Tanzania was a protectorate (more precisely a League of Nations Mandated Trustee territory), and accordingly it was subject to very different treatment. The example of Botswana is often held up as a model case study, but Bechuanaland, like Tanganyika, was a protectorate of Britain, and its post-independence economic performance is widely presented as a model of how to deal with newly discovered mineral wealth.

Tanzania's post-independence history has been relatively free of kleptocracy in government. The internal strife that occurs when factions within a nation seek to appropriate mineral wealth (see e.g. Collier 2007; Eifert *et al* F&D 2003), and which in turn holds back development, is consequently less relevant to Tanzania than it is to many other African states. Although resource riches, "tend to be associated with factional or predatory States..." (Auty 2), the presence of such systems would call for political rather than economic reform, and does not yet seem pertinent to the Tanzanian situation.

The first point to note is therefore that, contrary to common generalizations; wholesale social and political reforms are therefore NOT primary prescriptions for Tanzania.

Of course the discovery of mineral wealth should be an occasion of rejoicing. In particular it should be welcomed for the developments it can induce elsewhere in the economy. Before looking at the ideal fiscal and monetary policies of resource economies, one should investigate the ability of mineral extraction to stimulate such an economy. Mining can, but need not, have extensive linkages to the remainder of an economy. Mines operated as large scale formal enterprises often have substantial workshops at which large numbers of artisans acquire skills; while, in more developed countries, the inputs that the mines commission, are often fabricated in local engineering works. The development implications of an expanded mining sector can therefore be profound. On the other hand informal sector miners often use labour intensive methods such as panning and sluicing in alluvial mineral fields, and when going underground such operations rarely go very deep; consequently their linkages are far more limited. Nonetheless, their inputs are far more likely to be locally sourced. Limited linkages may also be a feature of some 'high tech' extraction approaches, such as drilling for off-shore gas, where rig maintenance may take place outside effective national border, and where product processing may be very technologically intensive, and where the workforce may be 'expat labour' intensive.

Two important determinants of the benefits of mining to the broader economy are the length and steepness of the local value chain. Whether the bulk of value addition takes place locally or abroad is a matter of real import. In much of Africa informal miners also sell informally to avoid taxes. Sales may be across borders or middlemen who are not nationals. The result is minimal addition of value. At the other end of the scale, production of oil and gas for export may have limited forward linkages if these are not used as feedstock by local industry or power-generators. Again, Tanzania's proposed expansion of electricity generation and the near completion of cement industry and the proposed fertilizer industry in Mtwara bode well for treatment of gas deposits and the linkages associated with it.

Even if there is little value added locally, one would expect a mineral discovery to be unambiguously advantageous. However, the existence of mineral wealth in a developing economy, especially when the set of commodities is narrow, can be exposed to a number of potential economic and political challenges. Many of these emerge from the tendency of resource rich economies to rely on a narrow set of revenues based on the minerals produced (export taxes, royalties, profits from equity stakes etc.). This makes them vulnerable to any short-term demand and supply side shocks that may affect these commodities. They are also exposed to such factors as, exchange rate effects; the tendency to rent seeking that often accompanies mineral wealth, and producers' attempts to minimize their tax obligations.

Some of the underperformance in mineral based economies is a result of the inefficiencies and political strategies induced by the abundant resource rents, and some comes from excessive reliance on mineral rents. However, Auty (2) argues that others emerge when policy makers try to address the Singer/Prebisch and Structuralist hypothesis that the terms of trade tend to move against primary commodities in the long run.

He argues that there need be no policy response to this when the movements are mere short run oscillations:

'the theoretical basis for a causal relationship between terms-of-trade volatility and growth is very weak. One reason for this is that movements in the terms of trade do not cause sharp changes in domestic economic conditions. A second reason is that Governments can adopt policies to reduce or eliminate the effects of changes in the terms of trade on the domestic economy'. (Auty 2pg...)

His point is most likely to be valid for a “cocooned mineral sub-sector” such as oil or gas, which has limited linkages to the rest of the economy. For example, one that uses expat labour, has low rates of local servicing, makes extensive use of imported components, and repatriates much of its profit. As Tanzania’s gas and mining sectors expand, the challenge will be to avoid such cocooning. In this regard the country’s current shortages of technical and business skill will need to be redressed urgently.

In contrast, the argument that government should not worry about movements in the terms of trade is far less persuasive if the impacts involve long and sustained periods of depressed mineral prices for economies with a narrow mineral base (such as Zambia). When the copper price underperforms, Zambia struggles. Such mining may use a lot of imported skills, but it also makes extensive use of local semi-skilled and unskilled labour, and job losses in the mining sector can be profoundly destabilizing (as recent experience in South Africa has demonstrated).

In terms of development strategy it is important not to over-respond to the threat of price volatility and shifting terms of trade. Thus Auty warns against over-forcing the pace of industrial diversification through excessive promotion of import substitution. This can lead the economy into factor supply bottlenecks, and the resulting Dutch disease effects may weaken the competitiveness of non-mining tradeables. In addition, the presence of resource wealth can worsen income distribution. In such a case it is important to guard against the temptation to put up trade barriers so as to protect the interests of new economic elite.

What then should a state do? Many policies have been proposed, but the most underlying one is the presumption that a viable developmental state is feasible. This may be a realistic assumption in an economy where mineral incomes are a small proportion of GDP. There, the state has an incentive to provide infrastructure and to encourage those enterprises that will broaden and deepen manufacturing, and with it enlarge the tax base. In such cases it is in the interest of the country to be ‘developmental’.

In a mineral rich economy, however, there may be a sense that ‘all is well’ and the incentive to focus on development and the need to cultivate human capital may be diminished. On the other hand, an excessive focus on education and development of human capital can carry risks of its own: there is a political risk in educating a country’s youth when the economy’s economic base is narrow and the jobs to absorb them do not yet exist. A Hirschman style unbalanced provision of excess capacity in order to induce development has much merit, but normal infrastructural investment is not politically destabilizing; an unemployed educated class may be. If its manufacturing sector takes off more slowly than expected, a mineral rich country that has invested mining revenues in education may be forced to bloat its civil service in order to employ the newly educated personnel.

Despite the suggestion that a new mineral sector may have limited direct backward and forward linkages to other sectors in the economy, commodity price fluctuations still pose a serious financial challenge to sustainable development in mineral exporting economies. Such fluctuations increase

the variance of government's annual revenues and hence raise the volatility of government expenditure. However, the transmission of these swings to the local economy can be mitigated in a number of ways. Among these are the introduction of prudent fiscal frameworks (such as Chile's fiscal rule), the use of hedging instruments, developing local financial markets, and securing access to international financial markets, and the use of sustainable investment tools such as that described in section 2.6.

The use of a fiscal rule is something of a balancing act. Too strict a rule will hinder effective counter-cyclical interventions (the EU budget deficit ceilings which restricted member states to deficits of 3% of GDP, and the USA's attempt to achieve budget balance through the Gramm-Rudman Act are testimonies to this point), too lax a rule, and nothing is achieved. Chile's fiscal rule uses a semi-fixed target for the overall budget surplus (originally set at 1% of GDP, then lowered to ½% of GDP, and again to 0% in March 2009). However, the government can run a deficit larger than the target to the extent that:

- (a) output falls short of potential, or
- (b) the price of copper is below its medium-term (10-year) equilibrium.

The assessments are made by two panels of experts who annually estimate both the output gap and the medium term equilibrium prices of copper and molybdenum. The result was seen during the copper boom of 2003-2008 when, despite public pressure for government to spend more, the expert panel ruled that most of the price increase was temporary and that most of the earnings had to be saved. As a result, the fiscal surplus reached almost 9% when copper prices were high. The country paid down its debt to 4% of GDP and it saved about 12% of GDP in the sovereign wealth fund. As a result, however, it was able to engage in major financial easing in the post 2008 recession.

If Tanzania were to use a parallel rule to the Chilean fiscal rule, a useful start would be to give legal independence to the assessment panels and to protect their members, as far as possible, from political pressure. A system like this would lift much of the responsibility for long-term fiscal discipline from the shoulders of parliamentarians.

The nature of the problem: *Spend or save?*

If a country has no shortage of infrastructure then the answer is simple; it needs to save! It can convert resource revenues into financial assets abroad, and then the income generated as their sustainable (permanent) income. This is the "permanent-income" or "annuity" approach (see the El-Serafy Method). However, this approach is poorly suited to developing countries that need to develop their infrastructure, but have a history of limited access to international capital markets for loans.

One way taken by many LDCs is to use swaps of mineral rights for infrastructure. Effectively they trade access to natural resources for the infrastructure needed to exploit them. China has been especially prominent in negotiating this sort of arrangement in Africa; obtaining mining rights in exchange for roads and railway lines. The advantage of such an approach is that there is little formal financial indebtedness and no crowding out in domestic factor markets. On the other hand few jobs and few skills are provided during the construction process, and its linkages to the remainder of the economy are few.

The issue of crowding out can be a problem if a country opts to meet its own infrastructure investment needs after a mineral discovery. Construction means that the state necessarily has to spend 'up front' before mineral revenues have begun to flow. If the funds are raised in the local market, the resulting capital shortage means high interest rates which in turn raise the hurdle rate that needs to be met as an internal rate of return on domestic investment elsewhere in the economy. The first point is therefore to ensure that any funded mineral, locally directed spending is on investment rather than consumer goods (Collier and others, 2010). However, even if the funding is raised in the international capital market, the process could lead to macroeconomic instability. In general terms, the increase in investment spending works through the multiplier process to impact on domestic demand which in turn creates short-term supply bottlenecks that then push up domestic prices and hurt overall competitiveness. More formally, many LDCs suffer from low absorptive capacity so that any sudden increase in investment spending translates into inefficiencies in project selection, implementation, and budgeting. A more gradual increase in spending may be advisable, with an initial focus on building capacity.

One approach is to begin with a lesser emphasis on physical infrastructure, and a greater one of the removal of existing bottlenecks; e.g. to expand tertiary training (boost teacher numbers, train bureaucrats etc.) and hire professionals able to select and manage complicated infrastructure investment projects. While this investment is under way, resource flows can be parked temporarily in external financial assets via a capital development fund or sovereign wealth fund, even if the international yields are relatively low. The placement of resource revenues in offshore accounts is often cited as a way of neutralizing the impacts of sudden influxes of foreign exchange. There is a need for local expertise of integrity to manage funds placements (including transfers when required). These impacts are commonly subsumed under the catch-all term, the Dutch Disease.

3.1 Dutch Disease

In its simplest sense, 'Dutch Disease' describes the effects of the sudden appreciation in a country's real exchange rate after an unexpected and large discovery of minerals. The inflow of hard currency can also engender a wealth effect, increasing domestic demand in general. The demand for tradables is easily met by imports, which continue to enter (and at lower prices because of exchange rate appreciation), there are limits to the elasticity of supply of domestic non-tradables and their relative prices rise. The result is loss of competitiveness by local producers of tradable goods, whether intended for export or for the local market, and an increase in the relative prices of non-tradables within the economy. The problem is accentuated when the local capital and factor markets are small, so that the mineral sector is able to crowd out other sectors within the economy, forcing up interest rates and factor prices, especially the wages paid to skilled artisanal workers.

What can a country anticipating this sort of problem do to mitigate it? The standard prescriptions are: a) float the exchange rate; b) save and sterilize windfall earnings, and c) maintain a stable money supply and a consistent fiscal stance¹².

The recommendation to avoid fixed exchange rates is based on political realities. A recent paper, (Cashin et al., *Commodity Currencies*. F & D Volume 40 No 1 March 2003) found that the choice of exchange rate regime made little difference to the volatility of Real Exchange Rates. Importantly, however, under fixed rates, the real exchange rate variability is driven by changes in product and factor prices. Such fluctuations are typically more economically (and therefore politically) painful

¹² Point (a) is covered here; points (b) and (c) are addressed in section 2.6

than movements in the nominal value of a freely floating currency.

Real mineral prices are subject to random shocks. Given this problem, for a mineral rich economy to maintain stable relative prices between traded and non-traded goods, it would need either a flexible nominal exchange rate regime (which facilitate the slow change of relative inflation rates) or (and far rarer) flexible wages and prices (which facilitate the maintenance of nominal exchange rate pegs). i.e. the impact of Dutch Disease can be mitigated by price systems that are flexible both upward and downward. Since real wages are often slow to fall, a flexible exchange rate system will have real advantages. While the short term consequences of Dutch Disease are dislocation and unemployment in sectors sensitive to the changing real exchange rate. The longer term implications are economic distortions. These are addressed in the next section.

3.2 Economic distortion

'Changing relative prices,' 'artificial promotion of uneconomically viable activities,' 'undue emphasis on import substitution beyond the point where it can be justified,' all are examples of economic distortions associated with sudden discoveries of mineral wealth.

One of the primary risks is that the mineral sector will become a major component of GDP, a major contributor to exports, but only a minor contributor to employment. This is especially worrisome with sectors like natural gas, where extraction is relatively technology intensive and the product can be simply liquefied and exported to generate immediate foreign exchange and state revenues. This situation can lead to what Auty describes as, 'the staple trap'; a situation in which high resource rent,..

"diverts government effort from promoting wealth creation and into rent capture and distribution, which tends to nurture a non-developmental political state". This, "... prolongs the period of reliance on primary product exports, which delays competitive industrialization and constrains employment creation so that governments deploy rent to expand jobs that competitive markets would not support." ...The result is an over-expanded government bureaucracy.... Consequently, far from achieving the competitive diversification of the economy, the staple trap trajectory expands a parasitic sector that depends on subsidies from the natural resource rent." (Auty, 1)

In the very long run, he suggests, the potential problems extend even further, impacting on population growth rates. The combination of rent capture, delayed industrialization and a bloated bureaucracy, **"renders the economy increasingly vulnerable to shocks and a growth collapse. A growth collapse retards the demographic transition so that population growth remains relatively high"** (Auty 2001, 24).

Where an economy is heavily distorted by a mineral sector, then setting up "early reform zones" is a way to address the problem. Fortunately, despite the flows of gold mining revenues, Tanzania's economy is not yet markedly distorted by mineral revenues. The imperative is to avoid the evolution of such distortions in the future. For this, the ideal is the establishment of an institution equipped to sterilize sudden foreign exchange flows, and then channel them into productive investments; such an institution being independent of the conventional monetary and fiscal authorities.

From a policy perspective such an institution's aims would have to be broad, on the one hand it

would aim to keep the real exchange rate relatively stable at a level consistent with the continued viability of the non-mineral sector. It would also aim to discourage state dependence on mineral rents. From a Tanzanian perspective the aim would be to keep the country's fiscal stance broad, with the tax structure continuing in roughly its present form [although the current 18% rate on sales tax is onerous and regressive and might be lowered, the 30% income and company tax rates are not high by world standards, and seem unlikely to act as brakes against investment].

The establishment of the Export Processing Zone (EPZ) authority in Tanzania during 2002/3 put in place some of the simpler institutional requirements that could mitigate the impact of changing real exchange rates and the Dutch Disease. Again, Tanzania has already been well served by its planners.

3.3 Rent seeking and corruption

The governments tend to extract and deploy rent in ways that weaken all three key sanctions against anti-social governance by applying rent to: (1) reduce personal taxation, which saps demands for political accountability (Ross 2001), (2) create a dependent form of social capital based on political patronage and (3) repress competition thereby easing pressure from the private sector for institutional safeguards like property rights and the rule of law (Li et al. 2000, Woolcock 2001).

A country in such a situation is necessarily exposed when commodity prices fall. The basis for patronage is no longer available: classic responses include rapid devaluation and reduced fiscal expenditure, both of which leave the state exposed to unrest. At the other extreme, increasing the budget deficit, effectively 'printing money' and simultaneously increasing exchange controls and levels of financial repression. Another option, approaching the IMF for assistance, often brings with it a demand for structural adjustment.

Regulatory capture (as happened in Zambia when the state intervened actively in the management of ZCCM, and in the disbursement of its budget, and other forms of political rent seeking), typically involve the exercise of (random) authority by special interest groups. One way to restrict this is to fully allocate rights. If foreign investment in the mineral sector is desired, then security of tenure of mineral rights, and a clear simple tax structure to reduce uncertainty, are policies to consider (broader benefits to such actions are cited by Acemoglu et al 2003). This is particularly important given the recent contest between small scale and large scale miners for mineral rights (Lange S. Land Tenure and Mining in Tanzania CMI R2008:2<http://www.cmi.no/publications/file/3008-land-tenure-and-mining-in-tanzania.pdf>).

Tanzania has a history of conflict between large and small miners. The large operators appear to have greater leverage with the commissioner of mines who effectively controls access to mineral rights. They can also go deeper with greater safety and greater efficiency and may have more extensive linkages to the economy as a whole. Nonetheless, transparency in the allocation of rights, and allowing small scale operators to work out a site first, may be worth considering.

3.4 Transfer pricing and other means of cross-border wealth transfer

There are a variety of reasons why mineral economies may underperform. One is that they anticipate revenue streams that never eventuate or come too late or slowly. The basic problem is simple: firms and individuals want to minimize their tax liabilities. Tax evasion is a matter of policing

and appropriate penalties; but what about tax avoidance i.e. careful use of loopholes that help one to circumvent ones tax obligations. Among these are under-invoicing and transfer pricing. Vertically integrated enterprises price the goods they buy and sell internally to themselves or to their affiliates, so as to minimize their global tax liability. How is this to be counteracted? One response is to deal with tax evasion and capital flight – actual response is to penalize transfer pricing and thin capitalization (artificially high debt/equity ratio so as to reduce tax liability).

One established response is a *thin capitalization rule*, this specifies an acceptable debt/equity ratio that limits the amount of deductible interest for tax purposes. At the heart of all such controls, however, lies a requirement that there be a solid base of audit skills in the national tax authority- that's TRA, the National Audit Office (NAO) and Tanzania Mineral Audit Agency (TMAA).

There are other (simpler) approaches. One is to use a royalty based on mine revenues rather than mine profits. Another is to require repatriation and a full accounting of *all* revenues earned when minerals are sold abroad. Costs are then met from this amount, and any dividends will be distributed from it. It is then clear what is being remitted, and a dividend tax can be levied. This obviates a common problem, that the minerals are exported and all that returns is enough to meet local obligations which will ensure significant contribution to growth and development. It is a cumbersome way to achieve transparency and to minimize evasion, but it is becoming increasingly common.

3.5 Sustainability and the Hartwick rule

In the search for sustainability, Auty (2) described the macroeconomic policy problem as follows: *"What is required is not, however, the sustainability of the mineral exports that initially generate the economic growth, but rather establishing and maintaining the macro conditions for sustaining growth"*.

A more conventional approach is to find policies that will preserve the nation's wealth i.e. to only consume true (Hicksian) income. The problem is achieving this when future mineral receipts are unknown because resource demand and prices are volatile.

In principle the decision maker is being asked to think of government's mineral revenues as a form of borrowing (from the future). Instead of asking, 'what is the deficit before borrowing', ask, 'what is the deficit before mineral revenues?' This is what is known as the primary (i.e. non mineral) fiscal deficit.

The fiscus should then accumulate sufficient assets for the *expected* income on these savings to be able to fund the annual non-mineral deficit after the mines are exhausted. The risk is that future interest rates or prices may fall, reducing the value of the annuity. Given this risk the state could be ultra-prudent and not run a primary non-mineral deficit any greater than the interest it is earning on its *existing* savings; or it could run a primary non-mineral deficit as big as allowed by step 2 at current interest rates and prices?

Clearly the decision on an appropriate policy should depend on the extent to which the economy is diversified and its export revenues are stable. One way to move towards a diversified economy is to form *a capital development fund (CDF)*. This would direct mineral revenues towards public sector investment and human capital development, which is crucial

for sustained future growth and development. It is the practical embodiment of Hartwick's 1977 prescription that, to achieve sustainability, mining rents should be invested in productive assets, and only the income of those should be treated as the country's income. Such funds have become increasingly common (the Capital Development Fund (CDF) is one example that services a number of countries; examples of national funds have been established for some time in those in Jamaica and Nigeria). However, it has become clear that if they are to be effective, they have to be tightly regulated. The funds have to be channelled into infrastructural spending and not allowed to fund recurrent expenditures (i.e. not used to pay for civil service's wage bill). Properly managed such a fund should reduce future bottlenecks as it promotes diversification and skills formation in the economy, and at the same time help sterilize the exchange rate effects of mineral based foreign exchange inflows.

The idea is not new, CDFs have been in use for decades, but many have been conspicuously unsuccessful because their revenues were diverted away from physical infrastructure and into wage bills. The regulation and auditing of a CDF have to be strict if it is to achieve its purpose. There is much to be learnt from the experiences of countries like Jamaica, whose CDF failed conspicuously for this reason.

One allegory for the mining/sustainability problem is that of a youth who inherits a set of silver cutlery. He is short of cash. He could sell it off a knife or a spoon at a time, and in the end would be left with nothing, or could sell it, invest the cash, and live on the interest in perpetuity. The latter is the "sustainable" approach i.e. treat mineral riches as an asset, and therefore part of the country's stock of wealth. Sustainability requires that the value of this stock of wealth should not decline, although its form may change, as with selling the family silver. If the stock is consumed there is eventually nothing left. If it is invested there is a sustainable return. The question is therefore, how much of the country's mineral rents should be placed in a Mineral Revenue Stabilization Fund (or capital development fund) to keep the capital stock constant and yet allow for a real return? In other words, how to make Hartwick's ideas (described in the previous section) operational? The Tanzanian Gas Revenue Fund has the potential to be just such a tool for sustainable development. Its success, however, will clearly depend on its size and the maintenance of its independence in the hands of the central bank, -Bank of Tanzania.

Three methods are available to calculate the amount that should be saved and then invested:

*Repetto's (1989) suggested a "net price" approach: current market price minus average extraction cost (including normal profit) times the net reduction in the stock of the natural resource $(P-C)*Q$. i.e. take all economic profit for the funds, but allow a 'normal' profit to be earned and distributed. This is the ultra-cautious approach mentioned earlier. Hartwick and Hageman's (1993) approach required the calculation of the present value of all expected future net earnings from the resource beginning at the present and going on till the resource is exhausted. The calculation is then repeated, but beginning a year later. The difference should be saved in a fund. A caveat is that this method requires selecting an appropriate discount rate and making assumptions about future mineral prices and extraction costs and, as a result, it is difficult to operationalize.*

El Serafy's (1989) "user cost" method. Calculate the amount that would need to be set aside annually over the life of the ore body, to buy a perpetuity yielding an annual payment equal to the current net income generated by the resource at the going rate of interest? That amount should then be saved and invested.

The last two methods involve expected future costs and prices and can therefore be unstable; Repetto's approach is simpler and less controversial.

Regardless of the approach taken, the successful use of a capital development fund requires transparency. The revenue streams need to be visible and the process clear. The fund can be located at the central bank or can exist as an independent body, but irrespective of its location, one of its aims should be to smooth the State's spending pattern. Any surges in mineral revenues should not immediately be channeled into infrastructural development, but should be neutralized, if necessary by being invested abroad, until the local economy can absorb them without being distorted. This leads to the following point.

3.6 Smoothing resource revenue and state expenditures

A feature of the minerals sector is that it combines long leads and lags in supply with rapid fluctuations in demand. The result is that not only are mineral prices characteristically volatile, but predicting future global demands and supplies is often problematic, especially because mineral markets often fail to reach a conventional market clearing equilibrium; instead one often observes periods of sustained excess demand or excess supply. A glance at prices of key minerals in real US\$ is illuminating. The rapid price rise post 2002 brought real prices back to levels they had last been at in the 1970s. The period from the mid 1980s to 2000 had seen steady nominal prices for many mineral commodities, but falling real ones. Mines that closed in that period have often proven expensive to reopen, and many remain shut despite the current high prices. This is at odds with the underlying thinking behind the Hotelling model, which, in the common place textbook presentation, predicts that net mineral prices will rise smoothly over time so that the present value of expected future net prices will perpetually be constant.

From a policy maker's perspective it is important to note that empirical support for the Hotelling concept of rising mineral prices over the very long run is at best mixed. Moreover, real market experience until 2001 seemed consistent with Barnett and Morse's observation that actual commodity prices were falling in real terms. Certainly it seems likely that mining rents will fall over time for individual minerals in individual countries; a reality that policy makers should recognize early.

Even where the mining sector has limited linkages to other manufacturing sectors, short term price shocks are immediately destabilizing. These can be caused by fluctuations in world commodity prices or by changes in the real exchange rate. Such volatility can lead to:

- Sharp fluctuations in government expenditures, which affect both economic welfare and the level of investment in human and physical capital accumulation;
- Price distortions that deter investment and production in the tradeable sectors of the economy in favour of non-tradeables;
- Reduced mineral exports,
- Reduced incentive to engage in mineral exploration and development;
- Deterioration of the current account, which either reduces foreign exchange reserves and/or boosts foreign debt.

There can be unexpected windfalls on top of fully anticipated mineral rents. The former need to be saved and sterilized (in a stabilization fund) while the latter should be invested in productive assets. Similarly, it's important to distinguish between fluctuations (which recover in a relevant time

period), and long term trends (which might not). The recent boom in commodity prices might be followed by a long term decline. A stabilization fund can deal with volatility, but not with the long term trend!

Positive terms of trade shocks lead to Dutch disease. Negative ones lead to fiscal deficits which, in turn, lead to crowding out (rising interest rates) and inflation. This is especially true of small economies where local bond markets are small and the government's ability to borrow offshore is limited.

The volatility of mineral prices does not only affect national revenues. Internally it generates pressure on firms to vertically and horizontally integrate and to engage in long term contracts. At a national level, prolonged periods of both excess demand and excess supply have historically induced pressure to nationalize mines. The spread of World Bank type structural adjustment reversed much such nationalization, and there has been a general trend to privatization, but state takeover remains a threat among populist politicians and, where the threat is credible, it raises hurdle rates for foreign investment.

While Capital Development Funds can help sterilize foreign exchange inflows, a more direct approach is the formation of a mineral revenue stabilisation fund (MRSF) or sovereign wealth fund. Such funds serve several functions beyond stabilizing exchange rates, they also stabilize fiscal expenditures and influence the allocation of mineral rents between households and the corporate sector.

In an underdeveloped economy, some of the receipts accruing to the stabilization fund may need to be invested abroad simply because the local capital market is unlikely to be able to absorb them without being distorted. The same is true of sudden fluctuations in rents. The fund therefore sterilizes mineral based revenue flows, as well as providing a basis for sustainable future incomes.

Price volatility and uncertainty about the duration of swings present a fiscal challenge: if it is mere volatility then the aim is to smooth spending; but if a change in price is sustained then spending plans should be adjusted. However, the duration of a price change is not always known ahead. In good times prudent policymakers curb spending to build up a fund against future price falls. The optimal size of such a safety net is larger in countries whose resources will not be depleted for a long time (because such countries are likely to consume more of their resource revenues), and also where revenue volatility is greater and more persistent, and where the general public is more sensitive to changing state expenditure. One recent proposal is to use a sustainable investment tool.

A sustainable investment tool targets the issues that determine the efficiency of public investment. The first is the efficiency of the investment process itself. The second is the speed with which mineral revenues are translated into investment spending – if it rises too quickly efficiency is lost through supply bottlenecks, limited management capacity, and weak institutions. The last is the risk that available revenue streams may be volatile, reducing spending on maintenance and thus shortening the working life of new infrastructure. The following extract provides some insights into the workings of such a tool:

3.7 Appropriate levels of indebtedness in a mineral based economy

The answer to this question depends on the breadth of the mineral base (i.e. a single mineral or a multiplicity) and the proportion of GDP being contributed by the mineral sector. It also depends on

the maturity of the mining sector. New mines have uncertain, though often more affluent, futures and high debts, old mines have greater certainty, higher operating costs and typically lower debts. This is currently a Tanzania's gold sector major mineral driver, but gas may well take over shortly.

Indebtedness incurred to expand infrastructure in anticipation of currency inflows as mineral exports come on stream can be useful, but involves risk. This is even more the case if the indebtedness is incurred by borrowing from international lenders to nationalize a privately owned mining sector.

Box 3: Key Features of the Sustainable Investing Tool

The sustainable investing tool is based on a macroeconomic model that accounts for the following aspects in gauging the fiscal and macroeconomic effects of investing natural resource revenues.

- The growth effect of productive public investment: public capital can raise the productivity of private factors under explicit assumptions on the rate of return to public capital. The feedback effect of public investment on non-resource revenues is also captured. The additional non-resource revenues can be used for maintaining capital built with a resource windfall.
- Investment inefficiency: The economic literature finds that one dollar of investment expenditures can be translated into much less than one-dollar worth of public capital in LICs. This feature reflects weak institutions and limited managing capacity of LICs.
- Absorptive capacity constraints: When investment is scaled up too fast, limited absorptive capacity of LICs can further lower investment efficiency due to supply bottlenecks and lower administration and implementation quality.
- Fiscal and capital sustainability: Financing needs to cover recurrent capital costs to operate and sustain public capital. When large fiscal adjustments are required to sustain capital after resource revenues are exhausted, it implies that the scaling-up magnitude may be too large and should be revised downward.
- Dutch disease: Spending a large amount of natural resource revenues can lead to real appreciation of currency and hurt the competitiveness of tradable sectors. However, productive public investment can raise productivity in the non-resource sectors, counteracting and eventually reversing the effects of Dutch disease.
- Volatility in natural resource revenues: The framework can account for uncertainties in either production quantities or prices of natural resources and hence provide probabilistic assessments of the macroeconomic outcomes in policy simulations.

Ref: Ref: Yang, <http://www.imf.org/external/np/res/dfidimf/topic3.htm>

4. What lessons can we learn from other countries?

The Chilean experience and in particular their use of a fiscal rule, is important to note, as are the successful (and unsuccessful) uses of capital development funds and mineral revenue stabilization funds. The key long term risks clearly lie in over-reliance on mineral revenues to fund recurring expenditures. For example, when the civil service wage bill is funded by mineral revenues the state has rendered itself vulnerable to mineral price fluctuations. Same lesson can be learned from Ghana, where the country borrowed against mineral revenues and doubled the civil servant wage. Now the country is plagued into serious economic crisis. For this reason the budgetary process should begin by focusing on its non-mineral fiscal status. How solvent is the country BEFORE mineral revenues are added. Total prudence dictates that the deficit before borrowing should be sustainable even if mineral revenues were to evaporate. In reality, of course, the country can smooth its income flows using international borrowing; but the risk arises that mineral price falls may presage a sustained drop rather than a short term fall. So long as mineral revenues are used to fund infrastructural spending, and are phased in gently so that capacity develops and bottlenecks in the domestic economy are avoided, there is no reason why discoveries of mineral wealth should not be wholly beneficial.

There will always be pressure for government to spend more. For this reason caution and transparency are important when budgeting. But there is also a political dimension: if civil society can be educated to support longer-term goals then the state will be further encouraged to manage natural resources cautiously. For this reason an educated press is also important.

Similarly, attempts must be made to get the political debate to span longer horizons. The example of Indonesia is illustrative: during the 1970s the public's euphoria at rising oil prices was dampened by comparing current oil revenues to the country's long-run obligations including future pensions, debt servicing and paying off the debt of PERTAMINA (which was then a bankrupt state oil company). The result was restraint and debt servicing, the economy stabilized and PERTAMINA is now 122nd in Fortune's 2013 list of the world's 500 top companies!

External restraints can also help management. With globalization the opinions of credit ratings agencies have become increasingly important, especially for countries that issue bonds. These reinforce the bottom line, that 'prudence pays'.

We can also learn from other countries' experience of negative taxes. Eifert *et al* (F&D 2003, Vol40 No1) argue that transfers can be a useful mechanism for both distribution of mineral earnings and for economic stabilization. One example is totally transparent 'Alaska-style' direct financial transfers to individuals. However, mineral wealth can also be transparently transferred to communities or schools. They also argue for initially very low tax rates outside of the mining sector, to ensure compliance and create a culture of paying taxes in the longer term, in parallel with measures focused on improving tax administration to provide greater fiscal flexibility and macroeconomic stabilization.

Improvement in exploration technology and robust global demand for these resources suggest that mineral resources are likely to constitute an even bigger share of many countries' exports

and national income in the future, especially if commodity prices remain high. More and more countries are becoming oil, gas, and minerals exporters, especially in Africa. The exploitation of mineral resources can bring great benefits. Norway, Canada, Australia, Botswana, and Chile are among those who can demonstrate that. They have improved their human development by using their large mineral wealth effectively.

On the other hand, extraction of mineral resources has been a curse for a number of resource-rich countries. Some have grown at a slower pace than those without substantial natural resources. Indeed, the exploitation of natural resources has often been associated with economic mismanagement, growing inequality, corruption, political instability, and conflict like the case in the Democratic Republic of Congo (DRC).

The question is: Why have some countries been able to manage their natural resources successfully, while others have failed to reap the potential benefits? Examining specific cases can identify the answers.

For example, Botswana is a small, land-locked southern African country. It is the world's largest producer of diamonds by value. It has been able to translate its resource wealth into growth and development. Botswana set up mechanisms to ensure that a significant part of its mineral resource revenue is allocated for investment in health and education. It also invests a portion of its resource wealth in its Pula Fund, which serves as a buffer against price volatility and preserves a share of the rents from diamond exports for future generations.

In another case, Norway has drawn on its oil wealth to move from being one of the poorest countries in Europe during the early 1900s to lead UNDP's global Human Development Index frequently in recent years. Both Botswana and Norway have a consistent record of good management of natural resources. Other countries have had trouble in the past, but have made significant improvements in recent years. How might Tanzania follow Botswana and Norway? As already noted it faces to key bottlenecks, local skills and local infrastructure. Neither can be rectified immediately, but both have to be addressed. One advantage of infrastructure provision is that it can be used to engender skills. In this regard it is important that contractors should use Tanzanian labour and local sub-contractors where feasible.

For example, Nigeria's first oil boom from 1973 to 1983 is seen to have been largely wasted, but that of the second boom from 2003 to 2008 is viewed as having been more successful. Economic reforms in Nigeria have been establishing a foundation for better application of the proceeds of the country's natural resources to lift economic growth and human development. Nigerian GDP per capita at purchasing power parity increased by 45 per cent from \$1,496 in 2000 to \$2,135 in 2010, compared to less than a four per cent increase the decade before.

Natural resource wealth has presented particular challenges in countries where conflict has erupted over the control and exploitation of natural resources. The "resource curse" has triggered, escalated, and sustained violent conflicts in such cases.

Even without the curse of protracted conflict, the dividend from resource exploitation can be short lived if not applied strategically. Nauru, a small island nation in the South Pacific, was endowed with significant phosphate deposits. Their highly profitable export gave the country the second highest per capita income in the world in the late 1960s and the 1970s. Today, the accessible

phosphate on the island is exhausted; the revenues have gone; and local people are left with a narrow, environmentally precarious rim of land circling a wasteland where the open-pit phosphate mine operated.

In each region of the developing world, there are examples both of countries, which have translated their resource wealth into human development and those, which have not been able to do so. Through good governance and sound long-term development planning, countries can avoid the effects of the resource curse, and provide quality services, such as education and healthcare, to their citizens. Effective anti-corruption laws and high civil society engagement also encourage governments to be more transparent about how they are spending and distributing the country's natural resource wealth.

4.1 Norway and Botswana

Both countries followed this sort of path. Neither managed to achieve 100% success, though both avoided the major pitfalls. The Norwegian economy demonstrates significant distortion; prices of non-tradables are extremely high, and labour costs are significantly above those in other European countries with similar levels of development. Botswana has fallen into the trap of expanding its bureaucracy to absorb the emerging educated elite of its educational system. Being a landlocked country with a small domestic market and few other assets, it is difficult for the country to expand its manufacturing sector competitively. It has done well in the circumstances, in part due to the implosion of the Zimbabwean economy and the flow of industrial activity over the border, but the potential linkages from its mining sector to the remainder of the economy are not as great as they could be.

The political process can be central. In Norway parliament was involved in effective consensus building, adopting a transparent budgetary process. Sectors such as agriculture and fisheries, which lead wage bargaining in Norway, have been involved in the budgetary process even though they are not directly involved in the oil and gas sectors.

One of Norway's most conspicuous successes was its Sovereign Wealth Fund, which allowed improved pensions and a countercyclical fiscal policy. By contrast the fund set aside by government in Chad was a failure: the government changed the rules for the funds and used the resources inefficiently. For many, the role of the sovereign fund is to enable strict regulation related to the use of the resources. However, there are examples of when this has not been effective, since Norway's fund rules allowed a highly flexible use of the resources, resulting in success, whilst in Chad, the fund rules were highly restricted but did not achieve good results. (Meller&Simpasa 2011).

Botswana's fund, established in 1994, has been operating successfully ever since. It is held by the country's Reserve Bank. In addition to providing a long term home for some of the country's diamond wealth, and transparent long-term guidelines for the management of foreign exchange, It provides a home for windfall foreign currency reserves.

4.2 Zambia

Zambia's lessons to Tanzania come in the form of tax systems and direct state involvement. The problem with poorly designed tax systems was visible when prices began rising sharply in 2002. Zambia initially had little fiscal benefit from the copper price boom. During the first four years of

sustained high prices (2004-2007), revenues from copper, as a share of total fiscal revenue was equal to or below 1%. Only after the revision of the fiscal regime in 2008 did this share increase to above 3% (p19). Prior to that, because of tax concessions, mining companies were not remitting any mineral taxes to the Zambia state coffers.

When ZCCM was privatized the incentives offered to induce foreign firms to reenter Zambia had to be profound. This was one of the reasons that the country earned so little during the copper boom until its 2008 fiscal reforms which raised royalties from 0.6% to 3% of gross copper revenue, and the marginal tax rate from 30% to 45% (if taxable profits exceeded 8% of gross revenue).

It is worth noting that they also tried to impose a graduated windfall tax - the rates on this were 25% on gross proceeds when the copper price was above US\$2.50/pound (US\$5,600 per ton); 50% when the copper price exceeded US\$3.00/pound (US\$6,720 per ton); and of 75% in excess of \$3.50/pound (US\$7,840 per ton) (p76). However, this was rapidly withdrawn after facing severe opposition. Despite this the state has faced recent legal challenges on taxation (Vedanta/Konkola has just taken the government to court over a tax bill). The populist rhetoric of Mr. Sata (the new president) is also causing some problems.

In terms of state involvement the problem was the nationalization of the mines, and the extensive state interference in their operations after the formation of ZCCM, from which political parties and figures extracted rent. Thus the chairman and chief executive of ZCCM were members of the ruling party's central committee. Political issues could therefore overshadow technical advice provided by experts. Political pressures pushed ZCCM out of mining and into socially and economically unviable activities, including using its resources to maintain the President's state run luxury holiday resorts. It also suffered from an expanded workforce, despite aging infrastructure and shrinking revenues. Although mining production costs increased globally in general, ZCCM's expansion into non-core mining activities coupled with the state's capture of the mineral rent severely constrained the company's ability to retain any surplus for reinvestment in exploration to replenish dwindling ore quality and improvement of equipment to increase productivity at 49 existing mines.

Until recent times, Zambia's post-independence macro-economic experience demonstrated the destabilizing affects volatile world prices on a narrowly based commodity-led economy. High prices caused inflation, low prices caused recession. Despite this, as yet Zambia has no sovereign wealth fund.

5. Conclusion and Recommendations: The adequacy of Tanzania's mining policy and environment

In Summary, the consensus view on appropriate policies after a mineral discovery is as follows: keep to a flexible exchange rate policy, save abnormal inflows and sterilize them. Identify the abnormal flows by using a simple and transparent rule based on long term projections. As a simple example, expected revenues and costs from the mineral sector can be estimated for ten years ahead, and variations in the gap then treated as aberrations. In addition to saving and sterilizing abnormal inflows when mineral markets are booming, the state should be setting aside and investing expected mineral rents (user costs or Hotelling rents) in productive assets.

Step 1: Estimate the extent of the resource and its expected lifetime at various prices and rates of extraction.

Step 2: Try to maximize tax revenues without creating disincentives for production. In addition to conventional company tax, the state should consider levying a royalty (a tax on revenue) and an explicit tax on excess profits (the state can reasonably hope for about half of the rents generated by mining, and two-thirds or more from oil and gas—perhaps because oil & gas usually generate more rent. Actual collections may be lower if there are loopholes or inefficiencies in collection. Fiscal policies that raise less than these benchmark averages may be cause for concern).

Step 3: Try to achieve Fiscal transparency and good governance through strong fiscal institutions (see the section on the Chilean fiscal rule). Roles and responsibilities have to be clearly assigned, with an open budgetary process, publicly available information, and assurances of data integrity.

Step 4: Form a resource fund: when resource revenues are higher than budgeted, they should be saved in a resource fund (capital development, sovereign wealth fund or stabilization fund). Such resource funds should have strict rules, but should also complement fiscal policy; a wholly independent spending authority can be counterproductive. If the country's institutional capacity is weak then consider just having one resource fund.

Step 5: Deal with tax evasion and capital flight – i.e. monitor and curb transfer pricing and thin capitalization (artificially high debt/equity ratio so as to reduce tax liability). One established response is a thin capitalization rule, this specifies an 'acceptable' debt/equity ratio that limits the amount of interest that is deductible for tax purposes. However, stopping transfer pricing and other forms of tax evasion requires a solid base of audit skills in the national tax authority, The Tanzania Revenue Authority and the National Audit Office as well as TMAA. Requiring the return of all revenues from mineral exports before dividends are distributed is a cumbersome but effective aid to transparency.

When formulating and assessing the country's fiscal policy a number of points emerge.

- The non-mineral fiscal balance should feature prominently in the formulation of fiscal policy. Decomposing the overall balance into a mineral and a non- mineral balance is critical for

understanding fiscal policy developments, evaluating sustainability, and determining the macroeconomic impact of fiscal policy.

- The non-mineral balance, especially expenditure, should generally be adjusted gradually.
- The government should strive to accumulate substantial financial assets during the period of mineral production to sustain fiscal policy in the post-mining period.
- Many mineral-producing countries can, indeed, afford to run potentially sizable non-mineral deficits. Decisions on how big the non-mineral deficit is should be based on assessments of government wealth (including mineral wealth), rather than on current mining income. There are strong precautionary motives, however, that would justify fiscal prudence, including enormous uncertainty regarding oil wealth.
- As in any economy, fiscal policy in mineral-producing countries needs to support broader macroeconomic objectives. These include macroeconomic stability, growth, and an efficient allocation of resources.
- As a result of pro-cyclical fiscal policies and recurrent fiscal deficits, a number of mineral-producing countries must pay interest rate premiums on sovereign debt and face liquidity constraints related to sustainability and other policy concerns, making it more difficult for them to accommodate mineral revenue fluctuations. These countries should pursue fiscal strategies aimed at breaking pro-cyclical fiscal responses to volatile mineral prices, targeting prudent non-mineral fiscal balances, and reducing the non-oil fiscal deficits over time.
- While all tax revenues are fungible, mineral rents accruing to the fiscus should be targeted for productive investment (infrastructure and human capital) and should not be diverted into meeting recurrent expenditures (such as civil service wages).

A final comment drawn from the experience of other states: Avoid nationalization of the mineral sector or the purchase of mine shares with expected dividends. A mine is a depleting asset, by the time the shares have been paid for the deposit may well be approaching the end of its life. The original owners will have received payment and the state now possesses depleted resource. On the other hand requiring that the state receive a share of the equity in a new mine as a quid-pro-quo for access to the resource is a common and sensible approach.

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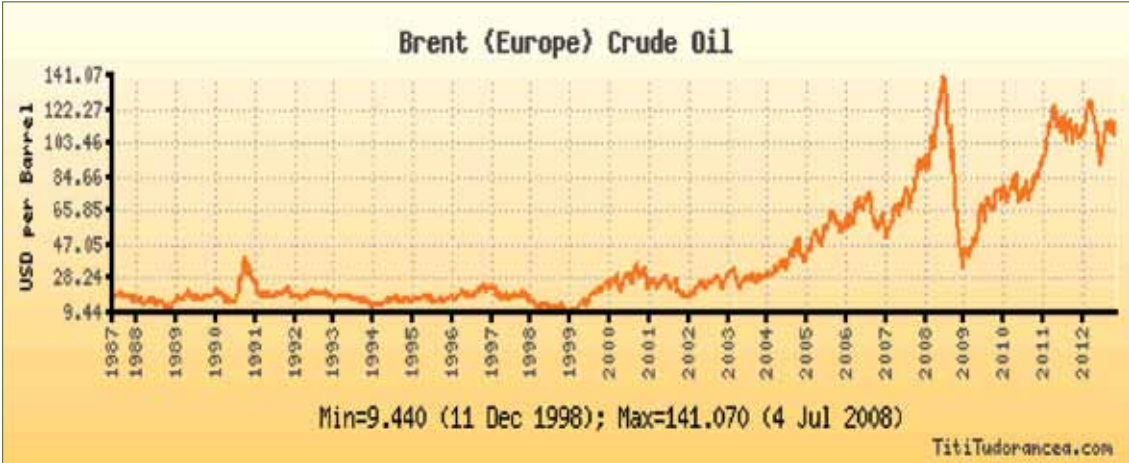
7. Appendix A

Chart 1: Gold prices 1971-2011



Source: <http://goldprice.org/30-year-gold-price-history.html>

Chart 2 Oil Prices (Brent crude)1987-2013

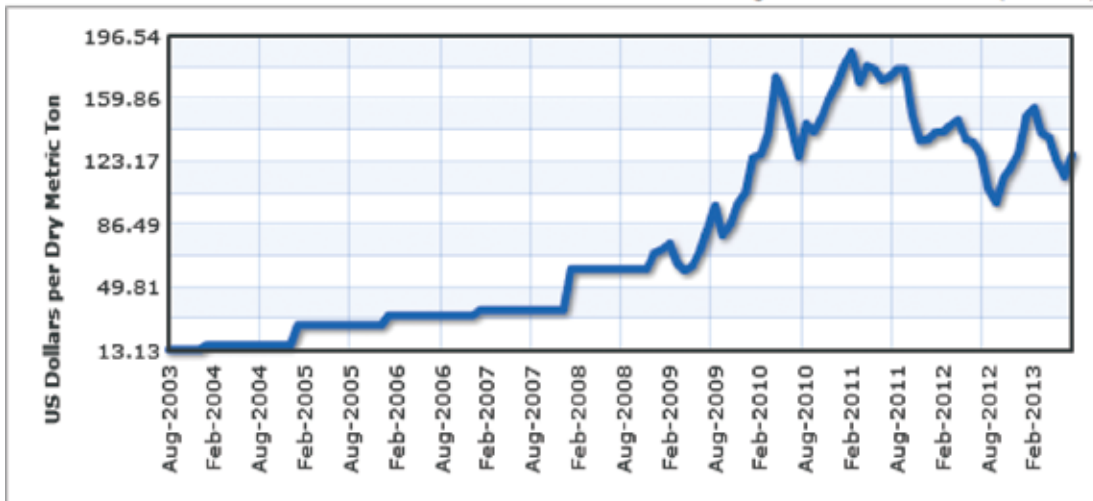


[http://www.titudorancea.com/z/brent crude oil prices graphs history europe.htm](http://www.titudorancea.com/z/brent%20crude%20oil%20prices%20graphs%20history%20europe.htm)

Iron Ore Monthly Price - US Dollars per Dry Metric Ton

Range 6m 1y 5y 10y 15y 20y 25y 30y

Aug 2003 - Jul 2013: 113.370 (820.33 %)



Description: China import Iron Ore Fines 62% FE spot (CFR Tianjin port), US Dollars per Dry Metric Ton

Unit: US Dollars per Dry Metric Ton

ESRF is an independent, non-governmental research institute registered in Tanzania with offices in Dar es Salaam. Its operations began in April 1994 in response to the need for the development of an institutional capacity for policy analysis. The foundation conducts policy-related research, capacity building programmes and policy dialogues that enhance the understanding of policy options within the government, the business community, the donor community, civil society and the growing private sector. It also undertakes demand-driven commissioned studies that conform to its mission.

Vision:

The vision of ESRF is to become a national, regional and international centre of excellence in capacity development for policy analysis, development management and policy research by the year 2015

Mission:

ESRF's mission is to build capacities in economic and social policy analysis and development management.

Objectives:

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