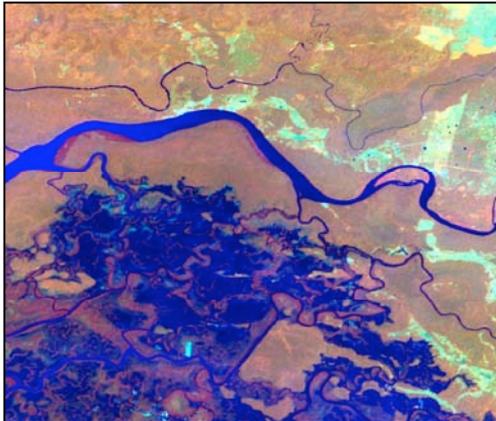


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Petroleum, Poverty and Security

Keith Myers, Chatham House



Summary

- Petroleum has always been a blessing and a curse. For oil-rich countries with few people, the benefits are enormous, as the Gulf states clearly show.
 - For those countries with less oil but a huge population, such as Nigeria, it is a very different story. This is because petroleum creates few jobs directly and generates a volatile, and ultimately unsustainable, revenue stream for the countries that produce it. Countries underestimate this at their peril.
- How much oil a country has is critical. A level of production above 50 barrels per head per year means countries almost always benefit. Below this level, more often than not, non-OECD producers have lower development indicators than their neighbours. For the exceptions, such as Malaysia, Iran and Thailand, the key to success has been to diversify the economy and reduce dependence on oil.
- Economic diversification requires the generation of competitive, non-oil products and services and access to markets – a difficult enough task. However, the economic growth required for poverty reduction also leads to increased oil consumption and an accompanying decrease in oil exports.
- China's growth has meant a transition from being a net oil exporter to importing over two million barrels of oil per day. However China still only consumes two barrels of oil per person per year, and Nigeria less than one; the G8 average (excluding Russia) is 16. Does Nigeria need to remain poor to maintain petroleum exports?
- This exposes a dilemma for policy-makers: how to reduce poverty *and* maintain exports. Producing and consuming nations need to work more in partnership. Policies that would help include the following:
- Producers need to commit to economic reform to encourage the investment in the non-oil sector required for economic growth.
 - Priority should be given to investment in human capital through sustainable health and education programmes insulated from oil price shocks.
 - Technology and know-how must be available to developing countries to enable energy-efficient growth.
 - Partnership between producers and consumers to promote energy-efficient non-oil-based industries in low-income producers would be a quid pro quo for secure energy markets.

Introduction

There is increasing focus on poverty reduction as it is apparent the world is currently not on track to meet the UN's Millennium Development Goals by 2015. The spotlight is turning more and more on the world's low-income oil exporters, which are mainly in sub-Saharan Africa. Why should countries blessed with so much petroleum be blighted by such poverty?

Surging oil prices have also prompted increasing concerns over energy security. China and India are both acquiring reserves overseas to address energy security, while the United States is increasing its reliance on West Africa as a supplier of crude oil and natural gas. Poverty-fuelled unrest in West Africa has the power to move markets. Policy-makers in Washington are also concerned that they may be called on to intervene militarily in the region to resolve conflicts and preserve oil supplies.

That petroleum can have serious negative impacts on low-income producing countries is well known and increasingly well documented (Karl 1997, Gary and Karl 2003, Moody-Stewart 2003, Christian Aid 2003, Kleveman 2003, Stevens 2003, Katz et al. 2004, Shaxson 2005). These negative effects include low, and sometimes negative, economic growth for the country, poor provision of basic public services, weak governance, widespread poverty and insecurity.

Some petroleum-producing countries succeed in achieving higher rates of development than their regional peers. Can a global perspective identify policies that deliver positive development outcomes which can be applied in Africa?

This paper starts by comparing sub-Saharan African producers with their peers from other parts of the

world. Have the region's producers fared better or worse? How much petroleum is needed to have a positive impact on development? In the discussion that follows, lessons from the success cases are used to explore pathways to eliminating producer poverty.

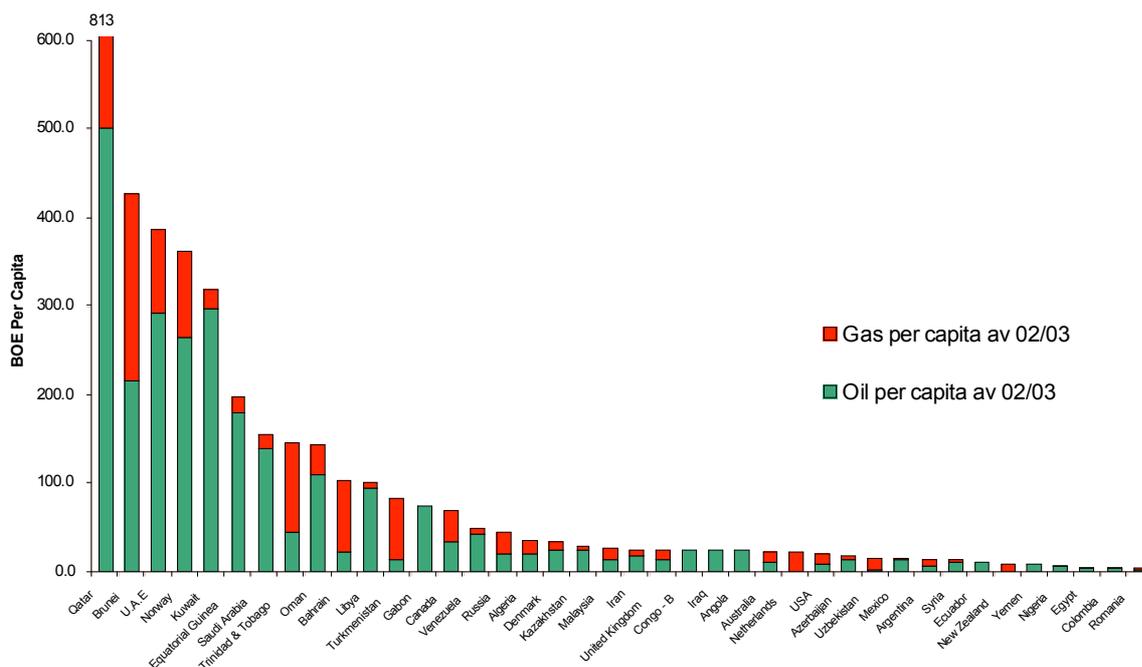
Global petroleum resource flows and sub-Saharan Africa

Petroleum output per head is a primary measure of petroleum resource flow, in the same way that GDP per capita is a measure of economic wealth. It is a useful parameter because it gives an estimate of the potential of petroleum to contribute to the economy of a country on a per capita basis. The actual contribution reflects the selling price, the cost of production, the multiplier effect of petroleum capital investment, the state's percentage take of revenues, how petroleum revenues are spent, etc.

The five most petroleum-rich countries on a per capita basis (Qatar, UAE, Norway, Brunei and Kuwait) each produced an average of 300 barrels of oil equivalent (boe) or more per head per year in 2002/3. These five countries are the true 'petro-states'. Note that a newly emergent producer, Equatorial Guinea, ranks 6th (see Figure 1).¹ The USA ranks only 28th in per capita terms, although it ranks 2nd in overall production.

Nigeria produced 2.23 million barrels a day of oil and gas in 2003. This makes it the world's 11th largest oil producer. However, with a population of 124 million,² it ranks only 37th on a per capita basis, well below the UK (22nd). This is equivalent to only seven barrels of petroleum equivalent per person per year, worth only a net \$140 for every Nigerian at \$30 per

FIGURE 1: WORLD'S TOP 40 PER CAPITA PETROLEUM PRODUCERS



Sources: BP Statistical Review of World Energy 2004, UN Population Division 2002 Revision, 2003 estimates of production. Statistics for 2002 and 2003 from BP's Statistic Review of Energy have been averaged and divided by UN population data for 2003 (Appendix 1).

barrel, compared with a GDP of \$800 per capita.³ It is clear that Nigeria cannot be transformed by petroleum alone.

This analysis highlights the first challenge for governments and industry – to understand and communicate the contribution the petroleum industry can reasonably be expected to make to a country’s development. Raised expectation which is not met leads to instability and conflict.

Petroleum production and human development in non-OECD countries

Having established how petroleum-rich the producers are, the next question is what impact petroleum has had on human development. One way of assessing this is to compare UN measures of human development (GDP, life expectancy and education attainment) with the average for the region for each producer. These data are shown in Appendix 2 for non-OECD countries only and have been plotted in Figure 2. The top 40 producers have been divided into four quartiles on the basis of their per capita production. Sub-Saharan Africa has seven countries ranked in the top 40 and is represented in each quartile.

Top quartile endowment countries (over 90 boe per capita)

All the world’s top ten per capita producers have human development indicators that are higher than the regional average, and all fall into the UN’s medium or high human development category (7 high and 3 medium). All ten countries have GDPs in excess of \$5,000 per annum and the top four enjoy GDPs over \$15,000 per capita. Petroleum production appears to have enhanced human development in these countries.

Equatorial Guinea is sub-Saharan Africa’s representative in the top ten. All its human development indicators are considerably higher than the regional average,⁴ although its GDP is low relative to those of its peer producers in other regions.

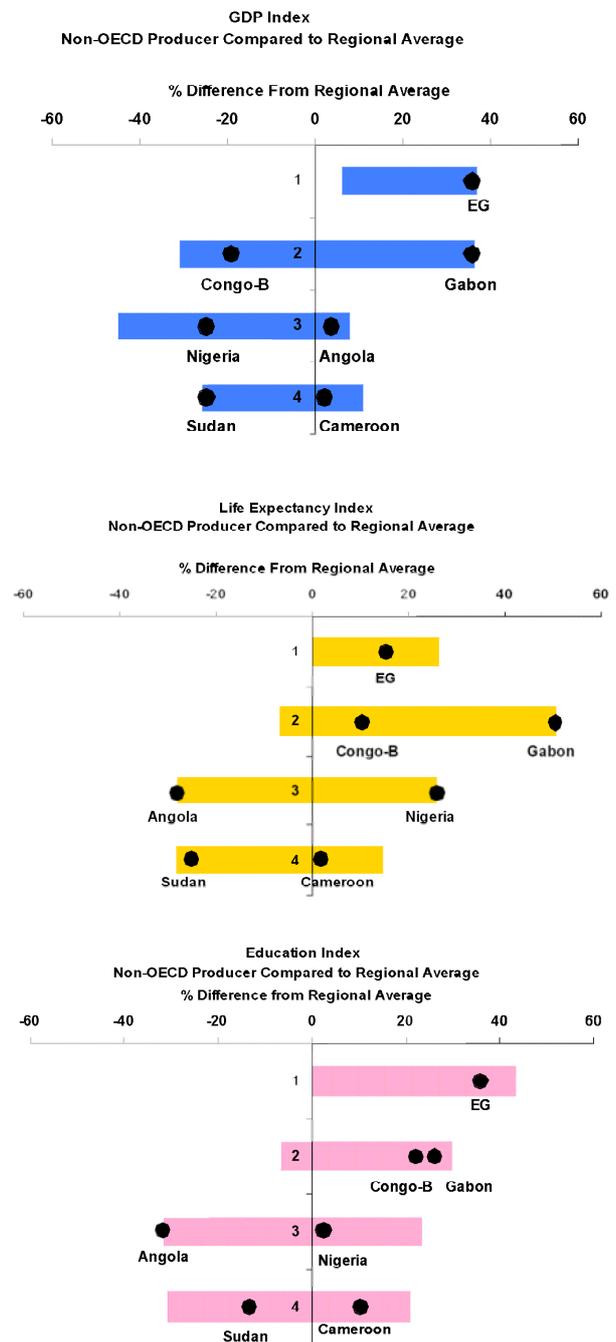
2nd quartile endowment countries (24–90 boe per capita)

2nd quartile countries all fall into the UN’s medium or low human development category (9 medium and 1 low). GDP per capita ranges from \$700 to \$9,000 and GDP indices are much more variable than those of 1st quartile producers, ranging from –31 per cent to +35 per cent of the regional average. Life expectancy and education indices are close to or above average in all ten countries.

The most successful countries in this category relative to the regional average are Iran, Malaysia and Gabon. Note that Gabon has historically had much higher oil production, peaking in 1995 at 115 barrels per head; this may explain why it scores so highly. The impact of declining production in a top quartile producer is considered below. Where there is a positive effect on human development it is less marked than in the high-endowment countries.

Five countries have lower GDP indices than their

FIGURE 2: HUMAN DEVELOPMENT INDICATORS FOR 40 NON-OECD PRODUCERS AS A PERCENTAGE DIFFERENCE FROM THE REGIONAL MEAN



Source: Data from 2004 Human Development Report. Note: The bars show the range of percentage difference for each quartile of producers on a production per capita basis. Quartile 1: >90 boe per capita, Quartile 2: 24–90 boe per capita, Quartile 3: 5.5–24 boe per capita, Quartile 4: 1.5–5.5 boe per capita.

neighbours; Turkmenistan, Congo and Iraq are the worst performers. Congo-Brazzaville’s low GDP is in stark contrast to other 2nd quartile countries and also to its neighbour Angola, which has a similar petroleum resource flow.

3rd quartile endowment countries (5.5–24 boe per capita)

3rd quartile countries cover the full spectrum from low to high in terms of UN human development (1 high, 6 middle and 3 low). GDP ranges from \$800 to \$11,200.

There is a very strong correlation between all lower-middle petroleum endowment countries and economic underperformance: in **8 out of 10** countries GDP is significantly **lower** than the regional average. The worst performers include Uzbekistan, Yemen, Nigeria, Ecuador and Azerbaijan. Argentina is the only relatively successful country in this category.

Life expectancy and education attainment indicators paint a less bleak picture; they are on average at or very slightly higher than the regional average. The exceptions are Angola and Yemen, which both significantly underperform on this measure.

Angola scores reasonably well on GDP but has very negative indicators for life expectancy and education compared to the average for sub-Saharan Africa. This reflects the legacy of decades of civil war. Congo-Brazzaville, Angola's neighbour, shows the opposite trend, with negative GDP and positive life expectancy and education indicators. Why this should be so deserves further investigation.

The negative economic outcomes occur in countries with diverse political, geographical and cultural contexts – from the former Soviet Union to the Middle East, sub-Saharan Africa and Southeast Asia. The common link seems to be a moderate level of petroleum endowment together with recent histories of weak governance, internal instability and/or war.

4th quartile endowment countries (1.5–5.5 boe per capita)

4th quartile endowment countries are all middle human development countries. GDPs range from \$1,400 to \$7,600. These countries are indistinguishable from 3rd quartile producers in terms of life expectancy and education statistics, but GDP indices are less negative and their range is narrower. On average these countries have below regional average human development indicators for GDP, health and education.

The worst-performing country in this category is Sudan, which has suffered from a prolonged civil war. Sudan straddles Arab and sub-Saharan cultures, although it is grouped with the Arab world in the UN statistics. By comparison with Arab countries, therefore, its human development indicators are low, although they are close to the regional average for sub-Saharan African countries.

At this level of endowment it is debatable how significant petroleum production would be in shaping human development.

Discussion points

Is petroleum a blessing or a curse for producers?

The answer to this question is both. The analysis reveals clear correlations between petroleum

production and human development that cross geographic, political and cultural differences. Petroleum is good for countries with lots of it and a small population. This is not to say that all is rosy for the top quartile producers. Under-employment remains a particular issue in many Middle East producers.

Why are there negative impacts on GDP at low levels of petroleum resource flow?

Petroleum has, more often than not, been bad for human development in less developed countries with an annual production level of under 25 barrels per head. The negative impact of petroleum on GDP has been greater than on education and life expectancy. If production per capita is between five and 25 barrels, then historical precedent suggests a country is almost certain to see a negative impact on GDP.

Why is this? If barrels are translated into value, 5–25 barrels is the equivalent of \$150–750 worth of oil at \$30 a barrel. If one further assumes that the state receives 60 per cent of this in rents, allowing for ex-country capital expenditure and oil company profits, this reduces to \$90–450 income per capita per annum. Not enough to eradicate poverty but enough to damage the non-oil economy through inflated exchange rates and to maintain bad governments in power. Where people have unrealized expectations of the benefits of being in an oil-rich (even a moderately oil-rich) country, conflict follows and a vicious cycle develops.

At this level of production per head, exposure of government spending to oil price volatility is particularly acute, and this leads to further economic and political instability. The top quartile producers have more revenue to sustain government spending through the price cycle. With dramatically lower petroleum revenue, countries such as Nigeria and Yemen find it hard to sustain the levels of government spending required to promote development. The narrow tax base further limits accountability for poor governance.

Do sub-Saharan African producers fare worse?

Human development indicators for these countries are generally lower than for their peers in other regions, reflecting sub-Saharan Africa's lower developmental state. However, of the region's seven producers, four have higher GDP per capita and five have higher life expectancy and educational attainment indicators than the average for the region; in Gabon and Equatorial Guinea, the highest per capita producers, all the human development indicators are significantly above the regional average. Nonetheless, significant poverty persists. Equatorial Guinea has a high enough oil endowment that oil revenues alone should eliminate poverty over the next few years. This is a benchmark against which the government should be judged.

Geology also plays its part. West Africa's reservoirs are not as big as in the Middle East and production rates tend to decline earlier. Gabon is a good example of this. It has been an oil producer since the 1960s. Production peaked at 365 million barrels per day (mbd)

in 1996/7 but has since declined to around 250 mbd as fields have become depleted. Analysts estimate that production may decline further to just over 100 mbd by 2012 unless major new discoveries are made. GDP peaked at over \$6,000 per capita in nominal terms, making Gabon one of the richest countries in Africa and famously the highest per capita consumer of champagne in the 1960s.

'We used to laugh at our neighbours,' the BBC News website quoted a Gabonian recently.⁵ 'The Cameroonians and the Equatorial Guineans – we used to mock them because they were not as rich as us. Now we have unemployment, inflation and beggars on the streets.'

The IMF commented in 2003, 'Over the last 10 years the authorities have not taken sufficient actions to reduce Gabon's oil dependency.' By 2012 GDP per capita will decline dramatically unless the urgently needed diversification programme is a success. There are clear lessons in Gabon for Equatorial Guinea.

Nigeria and Congo suffer from the negative GDP effects but both show higher than average life expectancy and education indices. Angola shows the negative impact on education and life expectancy of a prolonged civil war funded by oil and diamonds.

African states are more fragile, more heterogeneous, more prone to political instability and civil strife than most in other regions – witness the long civil war in Angola, recent coup attempts in Equatorial Guinea, Mauritania and Chad and continuing unrest in the delta region of Nigeria. The petroleum industry has to date been remarkably impervious to conflict, especially when reserves are located offshore. A vicious circle can develop whereby oil revenues provide bad governments with the means to maintain power and sustain conflict, thereby preventing the investment required in the non-oil sector for diversification of the economy.

Can Africa's emerging producers such as Chad and Mauritania avoid the problems of the past? Both have projected annual resource flows of around nine barrels per head. In the case of Chad, elaborate measures have been put in place by the World Bank and the Chad government to channel petroleum revenues towards poverty reduction.

What levers can be pulled to improve human development outcomes?

1) Increase petroleum resource flows to more than 50 barrels per head

Producers can choose how fast they produce their reserves, but their petroleum endowment ultimately reflects the geology, which cannot be changed. Outside the Middle East, few countries have the combination of high petroleum reserves and a low population required to do this.

2) Generate non-oil related income through diversifying the economy

Economic diversification is the only sustainable route to growth for low-income producers. Without economic diversification, governments become over-dependent on petroleum for revenue, with consequent low levels of job creation, over-exposure to fluctuating oil prices and vulnerability to exhaustion of a non-sustainable resource. Successful diversification involves investment in infrastructure, human and institutional capacity, and access to markets.

Contrast Malaysia, with a GDP per capita of \$9,000, and Angola, with \$1,700 (see Table 1). They have similar oil endowments but petroleum constitutes only 10 per cent of exports in Malaysia, as opposed to Angola's 92 per cent. Malaysia's consumer electronics industry was developed from scratch in the early 1970s and now dominates exports, employing almost 400,000 people. This contrasts with the 10,500 employed in Angola's petroleum sector. A high oil endowment does not have to mean oil dependence – consider Norway, where petroleum constitutes only 46 per cent of exports. Norway's GDP is almost double that of Kuwait, which has a similar petroleum endowment.

The unanswered question is: how can Africa's oil exporters diversify? Which industries can be nurtured to be competitive internationally? How should petroleum-consuming nations help? By opening their markets to agricultural imports, for example?

3) Improve standards of governance

The 13 countries in Table 2, which have one or more red Human Development Indicators in Appendix 2, are not known for high standards of governance.

TABLE 1: COMPARATIVE DEVELOPMENT INDICATORS FOR SELECTED PETROLEUM PRODUCERS

Country	Petroleum endowment (boe per capita)	GDP (PPP)	Poverty % below poverty line	Petroleum exports % total	Corruption Perceptions Index (rank out of 145)
Norway	362	33,000	-	46	8
Kuwait	320	17,500	-	90-95	44
Saudi Arabia	154	11,800	-	90-95	71
Angola	26	1,700	75	92	133
Iran	26	7,000	-	77	87
Malaysia	26	9,000	8	10	39
Azerbaijan	17	3,700	49	90	140
Nigeria	7	900	60	96	144

Sources: Transparency International, CIA World Fact Book, OPEC website, EIA website.

TABLE 2: PETROLEUM PRODUCERS WITH ONE OR MORE RED HUMAN DEVELOPMENT INDICATOR

Countries	GDP Index compared to regional average	Corruption Perceptions Index (Transparency International) Score out of 10
Yemen	-44.6%	2.4
Uzbekistan	-34.7%	2.3
Iraq	-30.8%	2.1
Sudan	-26.2%	2.2
Bolivia	-26.0%	2.2
Nigeria	-25.0%	1.6
Congo Brazzaville	-20.6%	2.3
Azerbaijan	-19.4%	1.9
Papua New Guinea	-18.8%	2.6
Vietnam	-18.8%	2.6
Ecuador	-16.7%	2.4
Turkmenistan	-12.5%	2.0
Angola	+6.3%*	2.0

*Health and education are red for Angola

None rank higher than 102nd on Transparency international's Corruption Perceptions Index. The countries listed in this table all need to be helped, or coerced, into better governance.

The richer and more diversified producers tend to also have lower levels of corruption as measured by the transparency perception index (Table 1). However, as Jeffrey Sachs points out, poorer countries are not necessarily poor because they are more corrupt – 'higher incomes lead to improved governance'.⁶ In other words, better governance and lower corruption tend to follow higher income levels. Greater transparency in revenue management will certainly help but is not enough on its own.

Countries such as Iran, Malaysia, Thailand and Argentina, which can be considered more successful, have very different systems of governance; thus it is clear that there is more than one recipe for success.

4) Increase the developmental impact of each barrel produced

Producers are tackling this actively in three ways. Fiscal terms whereby profits are shared with international oil companies are being designed to maximize government revenue. National oil companies (NOCs) are also taking larger direct stakes in producer assets. New NOCs are being formed, for example in Russia, Argentina and East Timor, reversing the previous trend toward privatization. Ultimately, however, there is only so much rent available to be captured by the state.

Other NOCs are exporting the knowledge they have gained from domestic production to acquire producing assets and generate profits overseas. Petronas of Malaysia and Statoil of Norway are notable examples. Chinese and Indian NOCs are expanding abroad for different reasons – primarily to secure oil supplies for their domestic markets to fuel non-oil economic growth.

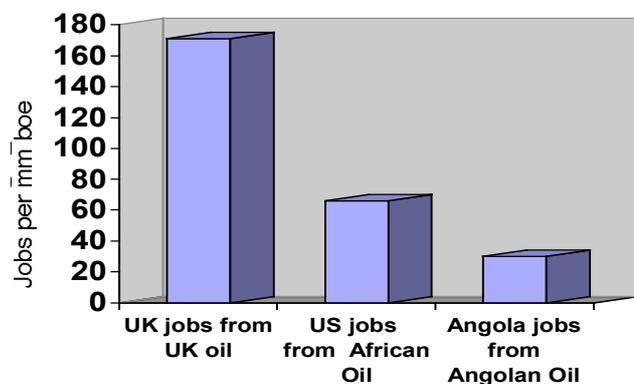
The third way is through increasing local spending and job creation by oil companies. Currently more

jobs are thought to be supported in the USA by West African oil investment than in West Africa itself (Figure 3). This is because oil companies spend little locally. Tougher local procurement and employment directives are being introduced to ensure more capital is spent and jobs are created domestically rather than abroad. Nigeria, for example, is committed to raising local content from less than five per cent to 45 per cent or more.

Focus on local procurement and local staffing can mean trade-offs against economic diversification if there is a limited local talent pool. Graduate-calibre staff may be attracted away from

government service or other important industry sectors.

Local procurement initiatives, therefore, need to be part of an integrated development and diversification plan. The key is to focus on creating the conditions for inward investment so that more work is done locally rather than emphasizing local ownership of the supply chain.

FIGURE 3: JOB GENERATION IN THE PETROLEUM INDUSTRY

For illustrative purposes, Figure 3 compares job creation in the UK from UK oil production, Angolan employment from Angolan production and US employment from West African production per mmbbl of oil equivalent produced. UK production supports 265,000 jobs (DTI website). West Africa production (four mbd) supports 100,000 US jobs (CSIS Report 2004). Angolan oil production supports 10,500 jobs (Hodges 2004).

Policy recommendations

Sub-Saharan Africa's producers share low levels of development and cover a huge range of oil endowment. Instability and conflict are likely to be

endemic in those that remain over-dependent on oil exports and fail to eliminate poverty. Success involves economic diversification and higher standards of governance. Success can be measured by the growth of non-oil exports and improving human development indicators.

There is a conundrum here. China's growth has meant a transition from being a net exporter to importing over two million barrels of oil per day. However, China still only consumes two barrels of oil per person per year, compared to the G8 (excluding Russia) average of 16. China is now investing heavily in Nigeria and Angola to supply its energy needs. Nigeria consumes less than a barrel currently. Does Nigeria need to stay poor to continue exporting oil?

Producing and consuming nations need also to cooperate to meet the twin goals of poverty reduction and maximizing oil exports.

Specific recommendations for the producers

1. Economic reforms are needed to improve the non-petroleum sectors' chances of attracting the domestic and foreign investment, required to grow the rest of the economy, employing more people, paying more taxes and exporting more. Reforms include privatizing non-core state

businesses, liberalizing markets, reducing tariffs and bureaucracy, clarifying property and contract rights.

2. Investing petroleum revenues in human capital through sustainable education and health programmes rather than military expenditure or vanity projects.
3. Using revenue stabilization funds to manage revenue volatility and preserve intergeneration equity.
4. Focusing domestic energy policy on energy-efficient non-oil growth to manage consumption and preserve exports.
5. Local procurement initiatives that focus on increasing the local content of the petroleum supply chain with an emphasis on generating industry with sustainable export potential.

Specific recommendations for developed, consuming countries

6. Opening domestic markets for non-petroleum imports from poor producing countries.
7. Transfer of technology to achieve energy-efficient growth in low-income, low- to moderate-endowment producing countries.
8. Partnership with producers to help promote less energy-intensive non-oil-based industries in low-income producers.

Endnotes

¹ This assumes a population of 0.496 million (UN Population Division). Some sources quote 1.03 million (World Bank Country Brief), in which case per capita production would be roughly half and would rank 12th.

² UN Population Division, 2002 revision.

³ CIA World Factbook.

⁴ Population, GDP and human development data are unreliable so caution should be applied.

⁵ 'Gabon's oil boom hangover', BBC News 2004, <http://news.bbc.co.uk/1/hi/world/africa/3733578.stm>.

⁶ Jeffrey Sachs, *The End of Poverty* (London: Penguin Books, 2005).

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Appendix 1: Petroleum endowment for top 55 countries

Rank	Country	Pop mm 2003	Oil per capita av 02/03	Gas per capita av 02/03	Petroleum per capita 02&03
1	Qatar	0.61	500.3	312.4	812.6
2	Brunei	0.36	216.1	210.7	426.8
3	United Arab Emirates	3.00	291.8	95.4	387.3
4	Norway	4.53	265.3	96.8	362.1
5	Kuwait	2.52	297.5	22.1	319.6
6	Equatorial Guinea	0.49	181.0	16.3	197.3
7	Saudi Arabia	24.22	139.4	15.0	154.3
8	Trinidad & Tobago	1.30	44.5	101.1	145.6
9	Oman	2.85	110.4	34.7	145.2
11	Bahrain	0.72	22.1	81.3	103.4
10	Libya	5.50	95.0	6.8	101.9
12	Turkmenistan	4.87	14.7	68.1	82.8
13	Gabon	1.33	73.5	0.0	73.5
14	Canada	31.51	34.0	36.6	70.5
15	Venezuela	25.70	42.1	6.9	49.0
16	Russian Federation	143.25	20.7	25.0	45.7
17	Algeria	31.80	20.2	16.2	36.4
18	Denmark	5.36	25.1	9.7	34.9
19	Kazakhstan	15.43	24.8	5.2	30.0
22	Malaysia	24.43	12.8	13.5	26.2
23	Iran	68.92	19.1	6.6	25.7
24	United Kingdom	59.25	14.5	11.0	25.5
20	Congo (Brazzaville)	3.70	24.7	0.0	24.7
25	Iraq	25.18	24.5	0.0	24.5
21	Angola	13.60	24.0	0.0	24.0
26	Australia	19.73	12.5	10.8	23.4
27	Netherlands	16.15	0	23.0	23.0
28	USA	294.04	9.4	11.7	21.1
29	Azerbaijan	8.37	13.5	3.8	17.4
30	Uzbekistan	26.09	2.4	13.0	15.3
31	Mexico	103.46	13.0	2.2	15.2
32	Argentina	38.42	7.6	6.4	13.9
33	Syria	17.80	12.0	1.8	13.8
34	Ecuador	13.00	11.7	0.0	11.7
35	New Zealand	3.90	0.0	9.2	9.2
36	Yemen	20.01	8.5	0.0	8.5
37	Nigeria	124.00	6.2	1.0	7.1
38	Egypt	71.90	3.8	2.1	5.9
39	Colombia	44.22	4.8	0.9	5.7
40	Bolivia	9.10	1.6	3.9	5.5
41	Romania	22.33	2.0	3.3	5.4
42	Indonesia	219.88	2.0	2.0	4.0
43	Brazil	178.47	3.1	0.3	3.5
44	Thailand	62.83	1.2	1.9	3.1
45	Papua New Guinea	5.71	2.9	0.0	2.9
46	Ukraine	48.50	0.6	2.3	2.9
47	Sudan	33.60	2.7	0.0	2.7
48	Tunisia	9.80	2.6	0.0	2.6
49	Italy	57.42	0.7	1.6	2.2
50	Vietnam	81.38	1.6	0.0	1.6
51	Cameroon	16.00	1.6	0.0	1.6
52	Peru	27.17	1.3	0.0	1.3
53	Cote D'Ivoire	16.60	0.7	0.5	1.2
54	China	1304.20	0.9	0.2	1.1
55	Pakistan	153.00	0.1	0.9	0.9
56	India	1065.46	0.3	0.2	0.4

Sources: BP Statistical Review of World Energy 2004, CIA World Fact Book, UN Human Development Report 2004, UN Population Division, 2003 revision.

Appendix 2: Petroleum endowment and human development indicators for non-OECD countries

Quartile	Rank	Country	Pop mm 2003	Oil per capita av 02/03	Gas per capita av 02/03	BOE per capita Average 02&03	Oil Consumption per capita '03	GDP per capita CIA '03	GDP per BOE	GDP Index	Regional Average	Difference	Life Expectancy Index	Regional average	Difference	Education Index	Regional Average	Difference
1	1	Qatar	0.6	500.3	312.4	812.6	2.20	21500	26.5	0.88	0.65	35.6%	0.78	0.69	13.6%	0.83	0.61	36.1%
	2	Bahrain	0.4	216.1	210.7	426.8	1.20	18600	43.6	0.88	0.64	37.6%	0.83	0.75	13.3%	0.87	0.83	4.8%
	3	United Arab Emirates	3.0	291.8	96.4	387.3	3.60	23200	59.9	0.9	0.65	36.5%	0.83	0.69	20.3%	0.74	0.61	21.3%
	4	Kuwait	2.5	297.5	22.1	319.6	3.90	17500	54.8	0.86	0.65	30.8%	0.86	0.69	24.6%	0.81	0.61	32.8%
	5	Equatorial Guinea	0.5	181.0	16.3	197.3	1.5	5498	27.9	0.67	0.48	39.6%	0.4	0.35	14.3%	0.76	0.56	32.7%
	6	Saudi Arabia	24.2	139.4	15.0	154.3	2.20	11800	76.5	0.81	0.65	24.6%	0.79	0.69	14.6%	0.71	0.61	16.4%
	7	Trinidad & Tobago	1.3	44.5	101.1	145.6	7.0	9600	66.9	0.76	0.72	5.6%	0.77	0.76	1.3%	0.87	0.86	1.2%
	8	Oman	2.9	110.4	34.7	146.2	7.0	13400	92.3	0.82	0.65	26.4%	0.79	0.69	14.5%	0.71	0.61	16.4%
	9	Bahrain	0.7	22.0	81.3	103.4	17.0	17100	165.4	0.86	0.65	32.5%	0.81	0.69	17.4%	0.85	0.61	39.3%
	10	Libya	5.5	96.0	6.8	101.9	21.0	6400	62.8	0.72	0.65	10.8%	0.79	0.69	14.6%	0.87	0.61	42.6%
Average			34	28	14	42	5	5610	154.18	0.53	0.48	1.1%	0.68	NA	NA	0.80	0.56	24.7%
2	11	Turkmenistan	4.9	14.7	68.1	82.8	6.0	5700	68.8	0.6	0.72	-12.5%	0.7	0.74	-5.4%	0.93	0.93	0.0%
	12	Gabon	1.3	73.5	0.0	73.5	3.0	5500	74.9	0.56	0.48	-35.4%	0.53	0.35	51.4%	0.72	0.56	28.6%
	13	Venezuela	26.7	42.1	6.9	49.0	7.0	4800	97.9	0.67	0.72	-6.9%	0.81	0.76	6.8%	0.86	0.86	0.0%
	14	Russian Federation	143.2	20.7	28.0	46.7	6.0	8900	194.8	0.74	0.72	2.8%	0.69	0.74	-6.8%	0.96	0.93	3.2%
	15	Algeria	31.8	20.2	16.2	36.4	3.0	5900	162.3	0.68	0.65	4.6%	0.74	0.69	7.2%	0.69	0.61	13.1%
	16	Kazakhstan	16.4	24.8	5.2	30.0	5.0	7000	233.6	0.68	0.72	-5.6%	0.69	0.74	-6.8%	0.93	0.93	0.0%
	17	Malaysia	24.4	12.8	13.5	26.2	8.0	9000	343.2	0.75	0.64	17.2%	0.8	0.75	6.7%	0.83	0.86	-3.5%
	18	Iran	68.9	19.1	6.6	25.7	6.0	7000	272.6	0.70	0.55	27.2%	0.75	0.64	17.2%	0.74	0.57	29.8%
	19	Congo (Brazzaville)	3.7	24.7	0.0	24.7	1.5	700	28.3	0.38	0.48	-20.9%	0.39	0.35	11.4%	0.74	0.57	29.8%
	20	Iraq	28.2	24.5	0.0	24.5	6.0	1600	63.4	0.49	0.65	-30.8%	0.39	0.35	11.4%	0.71	0.56	26.8%
Average			34	28	14	42	5	5610	154.18	0.53	0.48	1.1%	0.68	NA	NA	0.82	0.56	10.9%
3	21	Angola	13.6	24.0	0.0	24.0	1.5	1900	79.1	0.61	0.48	6.3%	0.25	0.35	-28.6%	0.38	0.38	-32.1%
	22	Azerbaijan	8.4	13.5	3.8	17.4	4.0	3400	195.5	0.58	0.72	-19.4%	0.78	0.74	5.4%	0.88	0.93	-5.4%
	23	Uzbekistan	26.1	2.4	13.0	15.3	2.0	1700	110.8	0.47	0.72	-34.7%	0.74	0.74	0.0%	0.91	0.93	-2.2%
	24	Argentina	38.4	7.6	6.4	13.9	4.0	11200	803.4	0.78	0.72	8.3%	0.82	0.76	7.9%	0.96	0.86	11.6%
	25	Syria	17.8	12.0	1.8	13.8	5.0	3300	238.5	0.6	0.65	-7.7%	0.78	0.69	13.0%	0.75	0.61	23.9%
	26	Ecuador	13.0	11.7	0.0	11.7	4.0	3300	280.9	0.6	0.72	-16.7%	0.76	0.76	0.0%	0.85	0.86	-1.2%
	27	Yemen	20.0	8.5	0.0	8.5	1.0	800	94.6	0.36	0.65	-44.6%	0.58	0.69	-16.0%	0.5	0.61	-18.0%
	28	Nigeria	124.0	6.2	1.0	7.1	1.0	800	112.2	0.36	0.48	-25.0%	0.44	0.35	26.7%	0.59	0.56	5.4%
	29	Egypt	71.9	3.8	2.1	6.7	3.0	4000	678.0	0.61	0.65	-6.2%	0.73	0.69	5.8%	0.62	0.61	1.6%
	30	Colombia	44.2	4.8	0.9	5.7	2.0	6100	1071.2	0.69	0.72	-4.2%	0.76	0.76	0.0%	0.84	0.86	-2.3%
Average			38	9	3	12	3	3650	368.61	0.56	0.56	-14.4%	0.67	0.67	1.6%	0.73	0.86	-2.0%
4	31	Bolivia	9.1	1.6	3.9	5.5	2.1	2500	446.00	0.53	0.71	-26.0%	0.64	0.76	-16.0%	0.86	0.86	0.0%
	32	Romania	22.3	2.0	3.3	5.4	4.0	7600	1418.9	0.70	0.72	-2.6%	0.76	0.69	10.1%	0.88	0.93	-5.4%
	33	Indonesia	219.9	2.0	2.0	4.0	2.0	3100	768.6	0.58	0.64	-9.4%	0.69	0.75	-8.0%	0.8	0.83	-3.6%
	34	Brazil	178.5	3.1	0.3	3.5	4.0	7600	2193.6	0.73	0.72	1.4%	0.72	0.76	-5.3%	0.88	0.86	2.3%
	35	Thailand	62.8	1.2	1.9	3.1	5.0	7000	2228.2	0.71	0.64	-10.4%	0.74	0.75	-1.3%	0.86	0.83	3.6%
	36	Papua New Guinea	5.7	2.9	0.0	2.9	1.0	2100	724.1	0.62	0.64	-18.9%	0.54	0.75	-28.0%	0.57	0.83	-31.3%
	37	Ukraine	46.5	0.6	2.3	2.9	2.0	5300	1824.5	0.65	0.72	-9.7%	0.74	0.69	7.2%	0.94	0.93	1.1%
	38	Sudan	33.6	2.7	0.0	2.7	1.0	1400	528.2	0.48	0.65	-26.1%	0.51	0.69	-26.1%	0.52	0.61	-14.8%
	39	Tunisia	9.8	2.6	0.0	2.6	3.0	6800	2576.2	0.7	0.65	7.7%	0.79	0.69	14.6%	0.74	0.61	21.3%
	40	Vietnam	81.4	1.6	0.0	1.6	0.5	2300	1396.0	0.52	0.64	-18.8%	0.73	0.75	-2.7%	0.82	0.83	-1.2%
Average			67	2	1	3	2	4570	1410	0.61	0.64	-9.2%	0.69	0.75	-5.5%	0.79	0.83	-2.8%

Sources: BP Statistical Review of World Energy, CIA World Fact Book, UN Human Development Report 2004. No human development indicator figures for Iraq. GDP index computed by the author for Iraq using UN formula based on CIA World Fact Book GDP estimate. GDP index for Equatorial Guinea computed using author's estimate for GDP. GDP based on IMF 2002 estimate of \$2,700 based on 1.07 million population factored up for UN population estimate of 0.5 million.

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