Extractive Economies and Sustainable Development: An analysis of infrastructure, health and social development

Paper presented to the United Nations Development Programme and Government of Brazil

Dialogue on the Extractive Sector and Sustainable Development – Enhancing Public-Private-Community Cooperation in the context of the Post-2015 Agenda,

Brasilia, Brazil, 3-5 December 2014.

Extractive Economies and Sustainable Development: An analysis of infrastructure, health and social development

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Abstract

Extractive economies can use the natural resource dividend for infrastructure and sustainable development. However, the reality of achieving this is far more complex than one might expect. This paper aims to present some fresh analysis of data of extractive economies to answer three main questions: a. how are extractive economies performing with regard to providing basic services such as health, education, water and sanitation; b. are there patterns of success; and c. what are the implications for policy and action especially in the context of the proposed sustainable development goals. The first issue of course is to define the category extractive economy. Using a new methodology, this paper focuses on the top 40 oil economies, top 41 gas economies and 56 mineral economies. Because some countries do have all three or two of these three natural resources, the overall dataset is of 91 countries covering both developed and developing economies and in all continents. Data pertaining to years 2002 to 2012 is analysed here. While some results are perhaps as may be expected, there are several disturbing findings as well. Extractive economies are among some of the poorly performing countries on indicators highly relevant to prosed SDGs on poverty, health, water and sanitation, and energy. This highlights the need for a strategic focus and developing appropriate mechanisms to use the natural resource dividend to make lasting transformation of social and economic well-being.
Key words: Extractive, natural resource, sustainable development, health, water
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Extractive economies and Sustainable Development: An Analysis of Infrastructure, Health and Social Development[1]

Introduction

The aim of this paper is to examine some key issues for development in the context of extractive economies or resource dependent countries. This paper uses a new method of categorising countries as extractive economies and based on that classification identifies three groups of countries, namely, oil economies, gas economies, and mineral economies. Its focus is on a selected group of such economies and to examine the performance of this group with regard to a number of key development indicators of relevance to the Sustainable Development Goals currently being considered.

A key challenge to sustainable development concerns effective use of natural resources. Such resources can be a boon or a curse. For many low income countries, the abundance of natural resources can be a 'curse[2]' (Sachs and Warner,1995;1997; Auty,2002) or a 'trap' (Collier,2008). In many natural resource rich economies, issues related to corruption, poor governance and in some cases ethnic conflict pose significant challenges to human development. A number of papers in Humphreys et al (2007) and Hogan and Sturzenegger (2010) discuss the issues related to resource curse and its avoidance. Ross (2012) argues

[1]

[2] A number of issues related to macro-economic management, inequality, and the role of state in 'resource curse' countries are

[2] A number of issues related to macro-economic management, inequality, and the role of state in 'resource curse' countries are examined in Humphreys et al (2007). Brunnschweiler and Bulte (2008) argue that Sachs and Warner were modelling resource dependence and not abundance.

that countries rich in petroleum tend to have less democracy, less economic stability and greater tendency to civil wars than others not having oil. Obi and Rustad (2011) discuss the politics of violence in the specific case of Niger Delta. However, it appears that the 'trap' is not inescapable provided the necessary institutions to manage resource allocation problems. Mehlum et al (2006) suggest that institutions determine whether the relationship between natural resource abundance and economic growth rate is negative or positive. Robinson et al (2006) also make a similar argument. They focus on the political processes and the behaviour of politicians in extracting rents and allocating these. They argue that institutions are the key to determining whether politicians use high discount rate and prefer resource booms or use resources more prudently. A similar institutional argument can be seen with regard to how silver boom in 16th Century was handled by institutions in Spain[3] (Drelichman and Voth, 2008). Kolstad and Wiig (2008) examine the role of transparency in fighting corruption in resource rich societies. Their analysis suggests that improving transparency may not be adequate in lifting the resource curse. Jones Luong and Weinthal (2011) include several case studies to argue why oil is not a curse.

Against this background of this literature, this paper aims to examine the performance of extractive economies with regard to various development indicators. Section 2 of the paper explains the methodology of selection of countries. Section 3 presents analysis pertaining to five of the proposed seventeen SDGs. Section 4 presents some analysis of resource rich countries and human development dimensions. Section 5 presents some issues for policy and critical action.

[3] Domenech (2008) examines Spain's growth during 1860-2000 and argues that far from acting as a curse, natural resources had a positive effect on industrialisation by 1930 and that these did not inhibit real wage growth during 1860-2000.

Selecting countries

Are resource rich or extractive economies different? Before we can answer this question we must decide which countries must be included in the category 'extractive economies' and which countries must be considered as the control group of 'non-resource rich' economies. The difficulty is that almost every country can be considered to be resource dependent. In their papers, Sachs and warner (1995, 1997) used various definitions including the share of primary products in exports.

For this paper, we have considered various alternative definitions and settled for a simple rule. We looked at the share of resource rents in gross domestic product (GDP) in 2012 and chose all the countries that had the share above the world average. In particular, we looked at resource rents for oil, gas and mineral sectors.

Extractive economy = An economy with resource rents > world average resource rents

Table 1: Criteria used to select 'extractive' economies

	Mineral rents as % of GDP in 2012	Mineral countries	Oil rents as per cent of GDP in 2012	Oil countries	Natural gas rent as % of GDP in 2012	Gas countries
Above world average	1.1 to 50.1	56	3.16 to 70.98	40	0.38 to 20.6	41
World average	0.81		3.13		0.37	
Below world average	0.0003 to 0.8	60	0.001 to 3.11	47	0.002 to 0..36	42

No rents or no data		103		127		131
TOTAL		219		214		214

Source: Author's calculation based on World Development Indicators

Because some countries have more than one resource, the final set of countries used in the analysis includes a few countries having all three resources and some having at least two resources and thus generating resource rents above the world average in that particular resource group.
The final set of countries is shown in table 2 below.

Table 2: Countries included in the three categories of extractives

All three lists: Oil, Gas, mineral	8	Uzbekistan, Bolivia, Kazakhstan, Cote d'Ivoire, Tunisia, Russian Federation, Mexico, Iran
Oil and mineral	3	Ghana, Sudan, Columbia
Oil and Gas	20	Kuwait, Libya, Saudi Arabia, Iraq, Oman, Azerbaijan, Brunei Darussalam, UAE, Turkmenistan, Bahrain, Algeria, Nigeria, Yemen, Qatar, Trinidad and Tobago, Norway, Egypt, Vietnam, Malaysia, Venezuela
Oil only	9	Congo Republic, Gabon, Chad, Equatorial Guinea, Angola, Ecuador, Cameroon, Albania, Canada
Gas and mineral	4	Peru, Tanzania, Australia, Indonesia
Gas only	9	Romania, Netherlands, Ukraine, Bangladesh, Pakistan, New Zealand, Argentina, Mozambique, Thailand
Mineral only	41	Mauritania, Papua New Guinea, Suriname, Zambia, Guinea, Guyana, Chile, Burkina Faso, Congo DR, Kyrgyz Republic, Lao PDR, Eritrea, Mali, Mongolia, Solomon Islands, Zimbabwe, Morocco, South Africa, Armenia, Botswana, Macedonia, Togo, Senegal, Jordan, Philippines, Jamaica, Brazil, Madagascar, China, Namibia, Kosovo, Bulgaria, India, Nicaragua, Liberia, Tajikistan, Burundi, Guatemala, Ethiopia,

		Bosnia and Herzegovina
TOTAL	94	

Source: Author's calculation

Extractive economies and development performance

In this section, we analyse the performance indicators of the three groups of extractive countries in relation to some of the sustainable development goals.

SDG1: End poverty in all its forms everywhere

It is difficult to pin point precisely what proportion of world's poor people are in extractive economies. Worldwide, the proportion of population below $1.25 per day of income decreased from 26 to 14 per cent between 2002 and 2011. However, in extractive economies dependent on oil or minerals, on average the $1.25 a day poverty appears to have increased during this period.

Table 3: Proportion of people below $1.25 a day poverty

	2002	2011
Top 40 oil economies	12.76	17.06
Top 41 Gas economies	13.99	6.72
Top 56 mineral economies	15.94	18.60
World	26.10	14.50

Source: Author's calculation based on World Development Indicators

The share of income received by the bottom 20 per cent of population is about 6 per cent and this has actually decreased between 2002 and 2012 in all three groups of extractive economies.

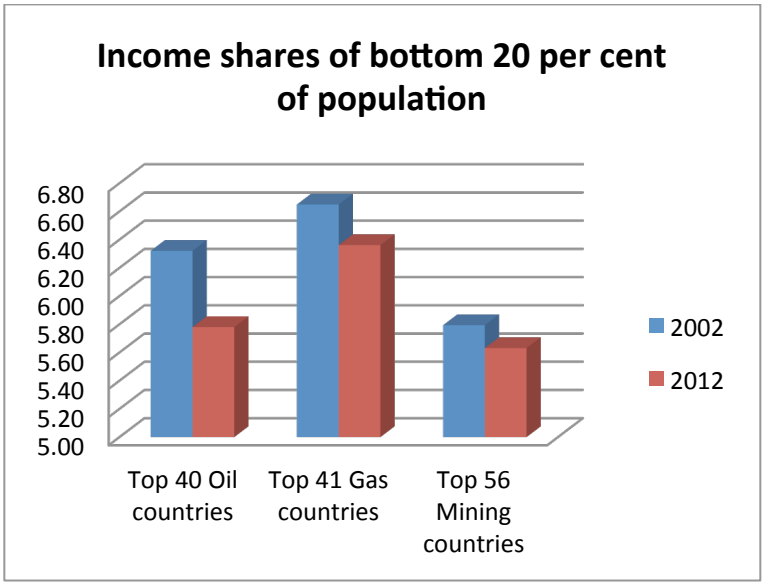

Figure 1: Extractives and SDG1: Income share of bottom 20 per cent of population. Source: Author's calculation based on World Development Indicators

In contrast, the share of the top 20 per cent of population is about 48 per cent in all three groups of extractive economies.

SDG2: End hunger, achieve food security and improved nutrition

In general, extractive economies seem to be slightly more dependent on food imports than the world average.

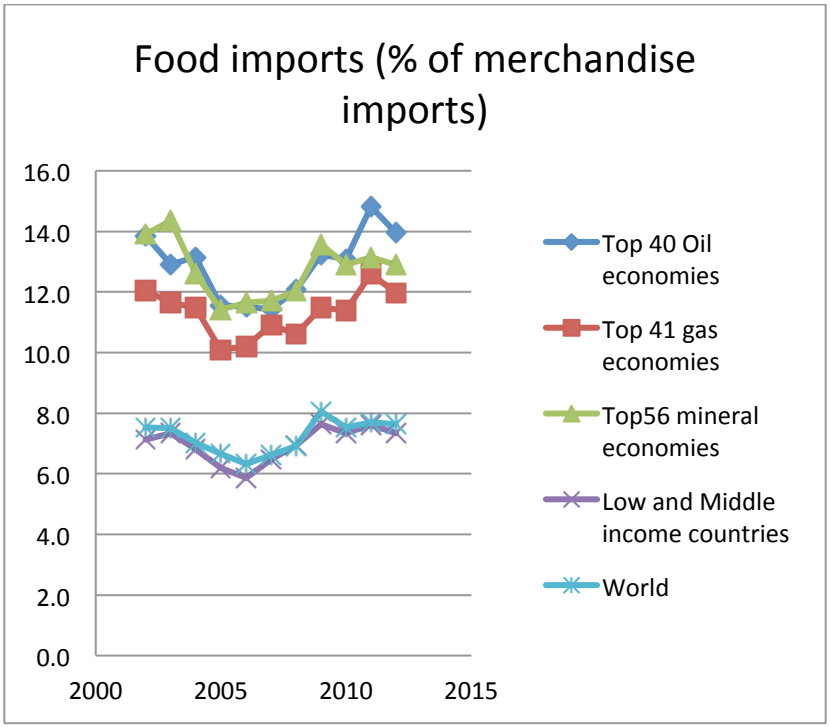

Figure 2: Extractives and share of food imports in merchandise imports. Source: Author's calculation based on World Development Indicators

In some of the extractive economies, a significant proportion of children under the age of five years are malnourished. This is evident from the figures in table 4 below.

Table 4: Selected extractive economies where a significant proportion of children are malnourished

	Country	Year	% of children under 5 malnourished
Top 40 oil countries	Congo, Rep.	2005	11.80
	Nigeria	2011	24.40

	Cameroon	2011	15.10
Top 41 gas countries	Bangladesh	2010	30.89
	Mozambique	2011	15.60
	Nigeria	2011	24.39
Top 56 mining countries	Mauritania	2012	19.50
	Burkina Faso	2010	26.20
	Congo Dem Rep	2010	24.20

Source: Author's calculation based on World Development Indicators

This suggests that though extractives generate significant additional resources, either these resources are not being targeted properly to benefit the poor or the mechanisms used are not having the necessary impact on poverty and ending hunger.

In some cases, new rush towards extractives can create destabilising factors which might contribute to increasing poverty or compound the channels through which redistribution takes place. In the context of West Africa, Bazilian et al (2013) argue that the new gas and oil discoveries in that region have not always created positive impacts.

My own analysis of Lao PDR suggests that the recent opening of mining sector and increasing resource rents from mining are correlated with a reduction in $1.25 a day poverty from 41 per cent in 2002 to 30.3 per cent in 2012. Until 2004, Lao PDR did not have any resource rents but from 2005 share of resource rents in GDP increased from 3 per cent to about 14 per cent by 2012. Though not all reduction in poverty can be attributed to the resource rents, the above data suggests that whether by intention or coincidence, the mineral boom is appearing to be making an impact on poverty.

SDG3: Ensure healthy lives and promote well-being for all at all ages

A mechanism through which resource rents can be used for improving health is by allocating some of the rents directly towards health expenditure. However, public expenditure on health is only a part of overall health spending and also increased spending does not automatically translate into healthy lives. While we note these caveats, the broad picture of resource economies suggests that on the whole in all the extractive country groups, between 2002 and 2012, health spending per capita increased almost three times especially in oil and gas economies. Though some of this is nominal increase, in real terms too there has been an increase though the extent of increase more modest than is suggested in figure 3 below. On the whole the level of spending per capita on health is much lower in mineral economies. Though this has increased four-fold between 2002 and 2012, it still remains much lower than world average.

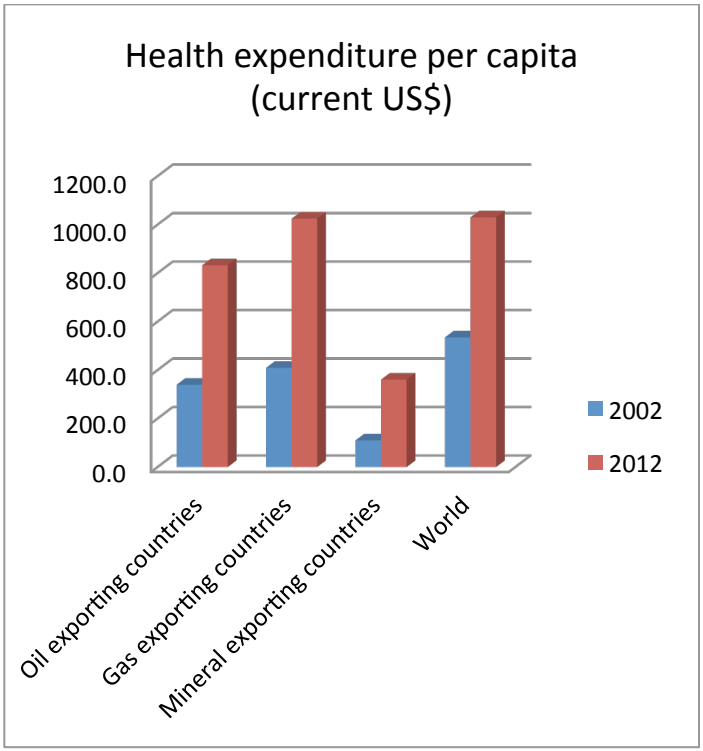

Figure 3: Health expenditure per capita increased significantly. Source: Author's calculation based on World Development Indicators

However, in both the two top gas economies, namely, Trinidad and Tobago and Turkmenistan, health expenditure per capita decreased between 2002 and 2012. It has also been rather erratic in the top two oil economies, namely Congo Republic and Kuwait and also in the two mineral economies namely, Mauritania and Papua New Guinea.

Another indicator of healthy lives is life expectancy. We looked at female life expectancy in particular as an indicator of both health and also gender equality. Female life expectancy increased in the top 40 oil economies between 2002 and 2012 from around 68.5 years to 71.5 years. However, during the corresponding period,

female life expectancy for non-oil producers was higher and increased from around 70 years to 73.1 years. The story is similar with regard to 56 mineral economies as compared with non-mineral economies having greater life expectancy. In 2002, the gap between these two groups of countries was 8 years and this decreased slightly to 6 years of gap by 2012 but still non-mineral countries having longer life expectancy for women. Australia and Norway both with over 80 years of life expectancy lead the world; however, some extractive economies such as Botswana with 45 years of life expectancy and Cote d'Ivoire with 51 years of life expectancy are also at the bottom of the world distribution of countries by female life expectancy. Thus extra resources from extractives are not translating to additional years of healthy life in many of the extractive countries.

Calain (2008) analyses health systems in Africa's resource rich countries and develops a framework to analyse health systems. The paper concludes that traditional resource curse analysis which tends to focus on economic aspects needs to be broadened to include health systems perspectives.

SDG4: Ensure inclusive and equitable quality education

Public expenditure on education as a share of GDP decreased between 2002 and 2012 in all the three sets of extractive countries in our analysis.

Ghana, Tunisia, Indonesia and Mexico are among the exceptions where public spending on education during the decade has actually increased.

An alternative measure is to look at education expenditures as a whole in the gross national income. [For example, even if public spending can decrease, if resource rents are leading to higher incomes then households might choose to spend additional

income on education.] Education expenditures as a share of gross national income has remained around 4 per cent in all the three groups if extractive economies. Two of the best performers are Uzbekistan and Botswana- both extractive economies spending nearly 10 per cent of gross national income on education.

Adjusted net enrolment rate in primary school age worldwide has been increasing from 86 per cent in 2002 to 91 per cent in 2012. For the 41 gas economies, net enrolment rate has always been greater than the world average. This increased from 90 per cent in 2002 to 95 per cent in 2012. For the 40 oil economies, this has been greater than the world average for most of the time but has been somewhat erratic rather than showing a smooth trend. In the case of the 56 mineral economies, throughout the decade of 2002 to 2012, net enrolment rate in primary has always been lower than the world average and increased from 82 per cent in 2002 to 86 per cent in 2012.

Literacy rate among the youth (15 to 24 years of age) can be crucial to youth employment. On this indicator, some of the extractive economies are facing a critical situation. In Chad and Cote d'Ivoire, more than a half of all the young persons are not literate. In a few other extractive economies, up to 3 out of every 10 young persons are not literate.

Table 5: Literacy rate among the youth- selected extractive economies

	Country	Year	Literacy rate, youth total (% of people ages 15-24)
Top 40 oil producer	Chad	2012	48.92
	Cote d'Ivoire	2012	48.31
Top 41 gas producers	Yemen	2012	87.41
	Banglades	2012	79.93
Top 56 mining countries	Papua New Guinea	2012	71.19

Source: Author's calculation based on World Development Indicators

SDG5: Achieve gender equality and empower all women and girls

Gender equality is a complex issue and a number of factors including history, culture and persistence of conflict can have a significant impact on many of the gender indicators.

When we look at an indicator such as share of women in non-agricultural employment (which can be considered to be an indicator of modernisation and industrialisation), the some of the results are disconcerting. While gas economies do very well on the whole, oil economies perform not so well on this indicator. Some individual extractive countries such as Guinea, Egypt, Morocco, Tunisia, and Guatemala are among the weakest performers with the share of women in non-agricultural employment being less than 30 per cent in each case in 2012.

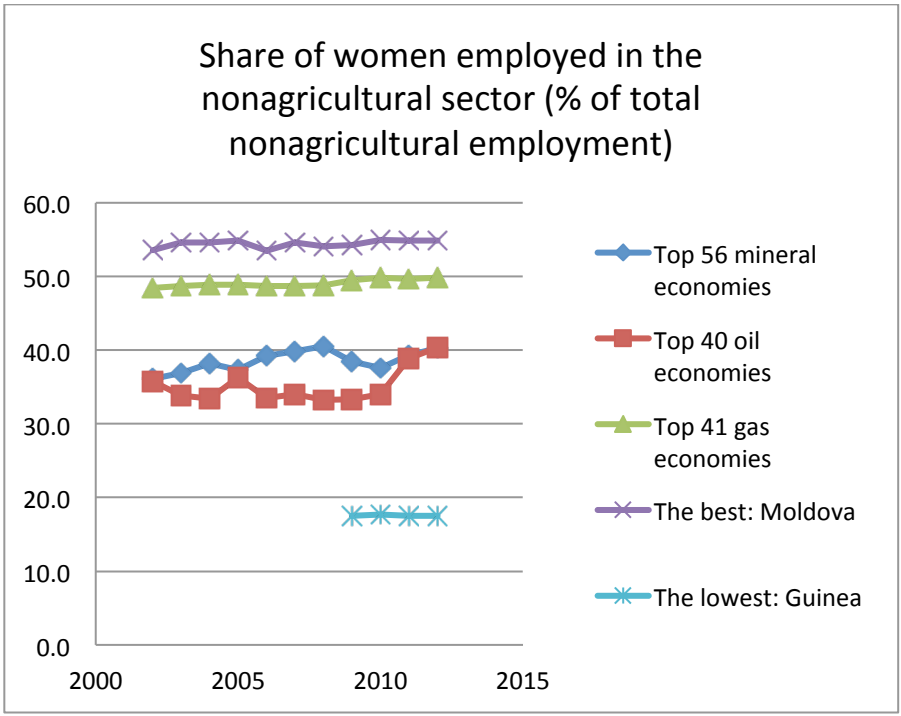

Figure 4: An indicator of gender equality- share of women in non-agricultural employment. Source: Author's calculation based on World Development Indicators

SDG7: Ensure availability and sustainable management of water and sanitation for all

In the case of oil and gas economies, the proportion of population having access to improved sources of water has steadily increased in line with world average from around 82 per cent to close to 90 per cent between 2002 and 2012. However, for the 56 mineral rich countries, the progress has been limited. It has certainly increased from around 61 per cent in 2002 to just under 70 per cent in 2012. However, even by the MDG target, these countries would have missed the target by 2015 significantly. More shocking is the fact that extractive economies are nine out

of the ten bottom countries in terms of per cent of population with access to improved sources of water.

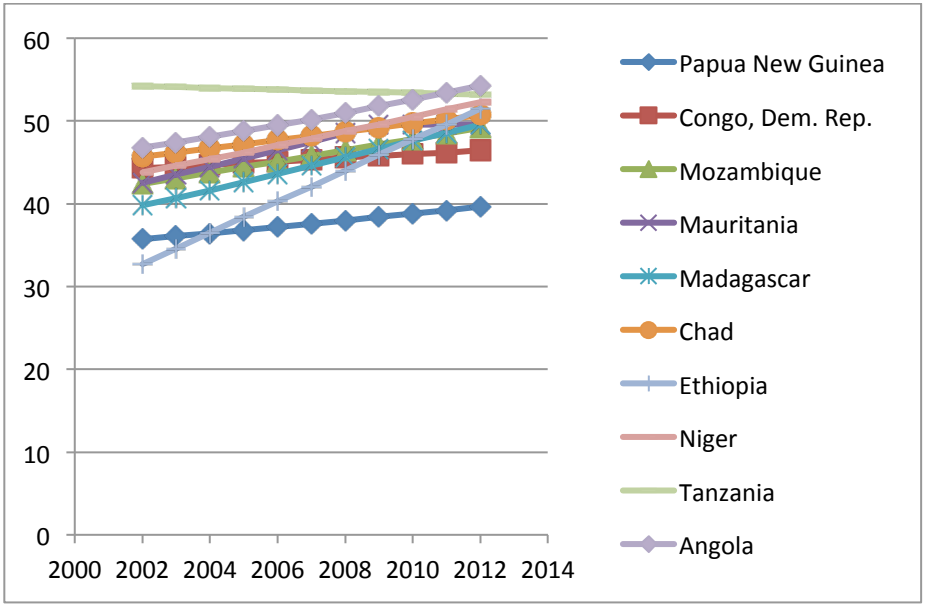

Figure 5: Access to improved source of water- 10 bottom performing countries. Source: Author's calculation based on World Development Indicators

In Papua New Guinea though this figure has improved steadily from 35 per cent in 2002 to just below 40 per cent in 2012, the fact that 60 per cent of population does not have access to improved sources of water is a cause for concern. In my previous work, I have examined the challenges of improving access to water (Anand, 2007a; 2013). The creation of a human right to water is a welcome step towards strengthening institutions and accountability. However, my previous analysis (Anand, 2007b) shows that creating a human right to water does not automatically lead to realising secure and sustainable access to

water for all unless the corresponding duty-bearer institutions and participatory mechanisms are all fully developed.
The picture with regard to access to improved sanitation is equally mixed. While oil and gas economies do better than world average mineral economies as a group are trailing behind the world average. The proportion of population with access to improved sanitation increased from around 53 per cent in 2002 to 60 per cent in 2012 in the 56 mineral rich countries as whole. Most of the bottom ten countries on this measure are all extractives. In those countries 80 per cent of population does not have access to improved sanitation. The consequences for especially infant and child health can be very critical indeed.

Natural resources and Human Development

The central argument in Mehlum et al (2006) is that whether natural resource abundance becomes a 'curse' or not is determined by institutions. In countries with good institutions, resource abundance does not result in a decline in per capita incomes but in countries with poor institutions this can happen.
The relationship between extractive industries and human development can be either positive or negative. The links are depicted in the figure below.

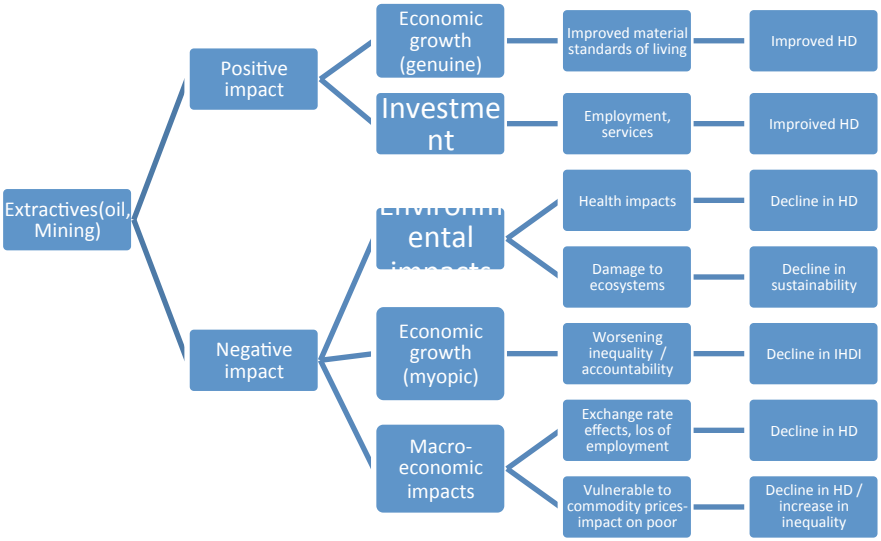

Figure 6: Extractives and human development- an outline of the links. Source: Author's explanation

Much attention has been focused on avoiding the negative macro-economic effects (through careful management of exchange rate and foreign currency reserves) and consequent fiscal impacts (such as unsustainable increase in public expenditure). Limited attention has been focused on impacts on human development. Pineda and Rodriguez (2010) question the natural resource trap idea and argue that the data of 1980-2005 show that there exists a positive association between resource abundance and HDI (as an indicator of HD).

Botswana, Chile and Malaysia are cited as examples of economies that used natural resource boom to maintain an improvement in HDI. Data presented in figure 7 suggests that both Chile and Malaysia sustained improvements in HDI. In the case of Botswana, the decline in HDI between 1995 and 2000 could be

attributed to declining life expectancy index due to HIV/AIDS outbreak.

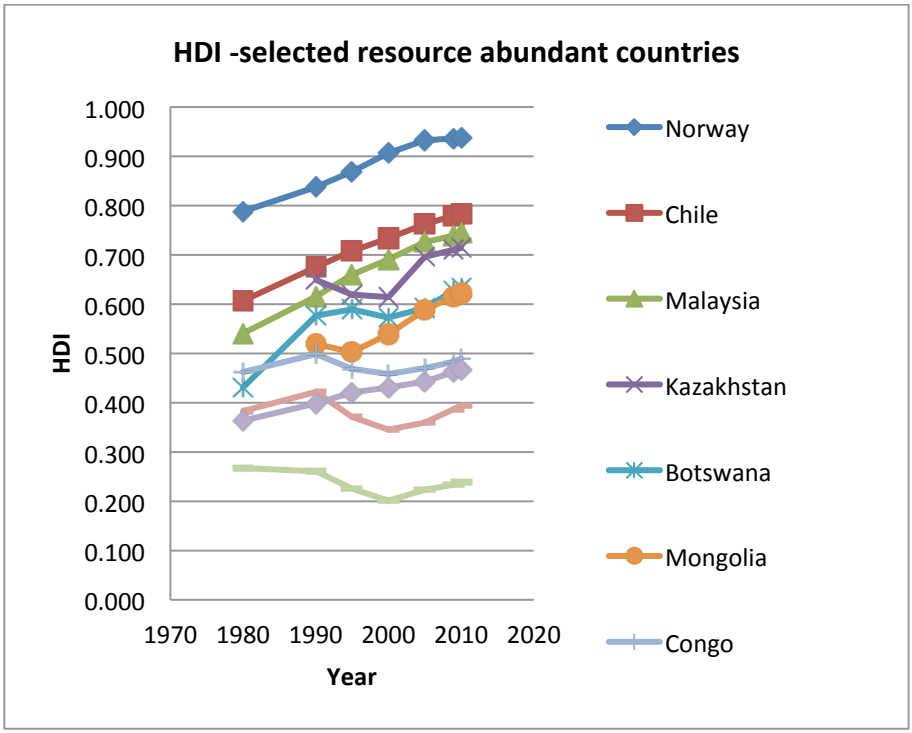

Figure 7: HDI trends in some resource abundant countries
Source: Based on UNDP,2010a.

Human development index is a measure that includes income per capita, and indicators of education and life expectancy. HDI is in itself not a full indicator of human development which is about enhancing substantive freedoms. However, as a starting point, HDI can throw some light on non income dimensions of well being. To examine whether extractive economies as a group perform differently with regard to human development index, we analyse data from 1995 to 2005. We can see that as a group oil

exporting countries tend to have high level of human development index than non oil exporting countries, and tend to do slightly better than non oil exporting or mineral based extractive economies when it comes to control of corruption. However, mineral countries tend to do better in terms of voice and accountability.

Table 6: Are resource dependent countries different?

	Mean For Non-oil exporting countries	Mean for oil exporting countries	Significance t-statistic	Mean for Non-mineral exporting countries	Mean for mineral exporting countries	Significance t-statistic
Human development index 1995	.5909	.7308	-3.518***	0.6984	.6436	1.276
Human development index 2005	.6225	.7719	-3.984***	0.7335	.6771	1.360
Voice 1996	-0.1935	-0.2458	0.239	-0.2814	-0.1444	-0.627
Voice 2005	-0.2889	-0.2015	-0.394	-0.3337	-0.1058	-1.036
Control of Corruption 1996	-0.3325	-0.0576	-1.075	-0.1208	-0.2226	0.400
Control of corruption 2005	-0.3837	-.0735	-1.404	-0.1185	-0.3214	0.910
N	22	35		33	24	

Note: t- statistic from independent samples t-test where equal variances are assumed.

One of the arguments in resource trap literature is that natural resources encourage political capture and thus distort incentives

for political agents to participate in political process. Thus, various institutions that are essential for governing the relationship between individual citizen and the state become instruments for private enrichment and corruption. To examine whether corruption worsens in resource rich economies, we do some simple analysis taking data from 1995 to 2005.

Table 7: Institutions and control of corruption in extractives

	R-1	R-2	R-3	R-4	R-5
Constant	-0.995* (-1.984)	-1.359*** (-4.023)	-1.305*** (-3.730)	-1.089*** (-3.745)	-2.307*** (-4.658)
HDI 1995	1.220* (1.856)	1.951*** (4.049)	1.929*** (3.968)	1.588*** (3.731)	3.060*** (5.080)
Control of corruption 1996	0.729*** (6.756)	0.650*** (8.250)	0.647*** (8.146)		
Oil exporting country dummy		-0.190 (-1.551)	-0.217 (-1.666)	-0.169 (-1.315)	-0.320 (-1.691)
Mineral exporting country dummy			-0.089 (-0.645)		-0.031 (-0.164)
Share of ores and minerals in merchandise exports 1995	0.002 (0.452)				
Voice 1995				0.699*** (8.847)	0.277** (2.518)
Adj R squared	0.805	0.781	0.778	0.743	0.505
N	26	51	51	56	56

Dependent variable: Control of corruption in 2005 (WGI Kaufman et al,2008)

These results suggest that human development index, voice and accountability and such mechanisms of individual agency may be much more significant than whether or not a country is oil based or mineral based. These results are preliminary and require further careful work. However, these seem to suggest that there is scope for optimism.

Conclusions

Only some of the head line indicators have been included in the paper. However, the results reported here suggest that while extractive sectors can play a very important role, there is need for caution and careful policy and institutional analysis to identify what works before extractives become the driving force of achievement with regard to sustainable development goals.

Extractive sectors can generate significant revenue to the government which can be directed toward health, education and key aspects of inclusive social spending with a view to making a serious dent on poverty and promoting healthy lives. However, this will not happen unless necessary policy instruments appropriate to the context are carefully designed through consultative process of voice and accountability. We do know that international standards mechanisms such as the EITI can help in improving the transparency of income generated by natural resource sectors. Whether the increased transparency of income translates into transparent and accountable allocation of such resources to sectors and activities that can have most impact on making development inclusive and sustainable is a moot point. Analysis conducted but not reported here in the paper showed that on many of the development performance indicators such as those relevant to the SDGs, there is not much systematic difference between countries that have joined the EITI and resource rich countries that have not joined the EITI. However, our analysis also shows that EITI can make a difference in macro-economic indicators especially with regard to exchange rate. Thus, perhaps EITI is having an effect in reducing 'Dutch disease' possibility among the extractive economies. However, there is now need to make further progress and either build on EITI or develop other multi-lateral instruments to encourage, facilitate, monitor and use evidence to help extractive economies achieve

inclusive and sustainable development. There is a need for further dialogue on the possible ways in which this can be done.

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Câmara Minera de Brasil

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