STRADE

Draft concept for a data and knowledge information system on mineral mining and trade and related environmental and socio-economic issues (Part II)

Andreas Manhart, Stefanie Degreif,
Peter Dolega, Doris Schueler

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

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Coordinator: Oeko-Institut e.V.

Contact: Dr. Doris Schüler, d.schueler@oeko.de , +49 6151 8191-127

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Project Partners:

OEKO-INSTITUT E.V. – INSTITUT FUER ANGEWANDTE OEKOLOGIE (Oeko-Institut)
Merzhauser Strasse 173, Freiburg 79100, Germany
SNL Financial AB (SNL AB)
Olof Palmes gata 13, 4st, SE-11137, Sweden

UNIVERSITY OF DUNDEE (UNIVDUN)
Nethergate, DD1 4HN Dundee, United Kingdom

PROJEKT-CONSULT BERATUNG IN ENTWICKLUNGS- LAENDERN GMBH (Projekt-Consult)
Laechenstrasse 12, Bad Vilbel 61118, Germany

GEORANGE IDEELLA FORENING (GEORANGE)
Box 43, Mala 93070, Sweden
UNIVERSITY OF WITWATERSRAND JOHANNESBURG (WITS)
Jan Smuts Avenue 1, Johannesburg 2001, South Africa

DMT-Kai Batla (PTY) Ltd
P.O Box 41955, Craighall, 2024, South Africa

Preface

This document is Part II of the “Draft concept for a data and knowledge information system on mineral mining and trade and related environmental and socio-economic issues”. Part I (deliverable 4.12) examines the necessity and feasibility of a data and knowledge information system on mineral mining and trade and related environmental and socio-economic issues.

The data is broadly structured into:

- Part I – Raw-material-specific information and
- Part II – Country-specific information.

While users might typically start their analysis with raw-material-specific information, this data architecture allows coupling this information with mining-country-specific data and indices.

One possibility for compiling the identified raw material information is presented in Annex I of Part I.

Part II here presents a concrete example of compiling a country-specific profile of materials.

1. Economic contribution from mining

Economic contribution from mining

Basic data on mineral's economic contribution

Mineral production

Parameter	Value	Reference
Production value, all minerals (ores, minerals, crude fertilizer, scrap, NF metals)	62 billion US$	ICMM (2014), data for 2012
Production value, all minerals as % of GDP (ores, minerals, crude fertilizer, scrap, NF metals)	2.9 %	ICMM (2014), data for 2012
Minerals of highest relevance:	Iron, accounts for 17 % of global production and > 80 % of mineral exports (value)	(IBRAM 2017e), data for 2012
Mineral exports, all minerals (ores, minerals, crude fertilizer, scrap, NF metals)	39 billion US $	(IBRAM 2017e), data for 2012
Ores and NF-metals exports as % of merchandise exports (ores, minerals, crude fertilizer, scrap, NF metals)	19 % (in 2010) ⇨ 10.8 % (in 2015)	WorldBank (2017c),
Mineral rent[1] (% of GDP)	1.3 %	WorldBank (2017c), data for 2015
Oil rent[1] (% of GDP)	0.9 %	WorldBank (2017c), data for 2015
Coal rent[1] (% of GDP)	0.005 %	WorldBank (2017c), data for 2015
ICMM Mining Contribution Index[2]	75	ICMM (2014), data for 2012

[1] A rent is the difference between the value of production for a stock of minerals at world prices and their total costs of production.
[2] The country with highest MCI has 96 scores; country without contribution have 0 scores.

Economic contribution of iron and steel exports

Parameter	Value	
Iron and steel exports as % of merchandise exports	4.3 %	Workman (2017), data for 2016
Export share of steel production (Steel export / domestic steel production)	44 %	Workman (2017), data for 2016

Economic contribution from mining

Government revenues from mining

Government revenues

Note: The data are preliminarily from 2012 data and should be updated in the course of the project

Parameter	Value	Reference
Government revenues from mining (CFEM mining royalties only; no corporate taxes and VAT included)	1.8 billion R$	IBRAM (2017e), data for 2012
Additional government revenues from further taxes (corporate taxes xxx %; export taxes xxx , VAT xxx %)	n.n.	
Total government tax revenues including social security funds	1500 billion R$	OECD.Stat (2017), data for 2012
Contribution of mining royalties to total government revenues including social security funds	0.1 %	Calculated, data for 2012
Contribution of all government revenues from mining to total government revenues including social security funds	n.n.	

Information on royalty and taxation regime

(status from 2012):
CFEM (Mining Royalty) is payable as consideration for the economic exploitation of mineral resources in their respective territories. They are distributed as follows:

- 12% to the Federal Government (DNPM 9.8%, IBAMA 0.2%, MCT/FNDCT 2%);
- 23% to the state where the mineral has been sourced;
- 65% to the producing municipality.

Tax rates are applied onto the net revenue, and they vary according to the mineral involved:

- 3% for: aluminum ore, manganese, salt-gem, and potassium;
- 2% for: iron, fertilizer, coal and other substances;
- 0,2% - precious stones, colored gemstones, carbonates and noble metals;
- 1% - gold

Corporate tax: 34 % (Deloitte 2017)
VAT: standard rate, average 17 %
Export tariffs: 0 % (World Bank 2017d)

Further Reading:

- CFEM – Compensação Financeira pela Exploração de Recursos Minerais, http://blog.cfem.com.br/ (in portuguese, data on 2015 and 2016 royalties)
- Natural Resource Governance Institute, Brazil's Performance on the Resource Governance Index, http://www.resourcegovernance.org/our-work/country/brazil?page=1 (focus on oil revenues)
- Wold Bank (2006): Mining Royalties. A Global Study of Their Impact on Investors, Government, and Civil Society. Internet: http://siteresources.worldbank.org/INTOGMC/Resources/336099-1156955107170/miningroyaltiespublication.pdf (lastvisited 10.05.2017)
- *Additional suggestions?*

Employment

General data on employment

Parameter	value	Reference
Unemployment rate	11 %	ILOSTAT, data for 2016
Share of industry in total employment	21 %	ILOSTAT, data for 2016
Total employment	95 million workers	ILOSTAT, data for 2017
Informal economy rate in the non-agriculture sector	36.9 % 30.5 million workers	ILOSTAT, data for 2013

Employment in the mining sector

Parameter	value	Reference
Workforce in mining (formally employed)	175 000 workers	IBRAM 2017e, data for 2011, http://www.ibram.org.br/sites/1400/1457/00000364.pdf
Informal workforce (estimates)	~ 300 000 – 500 000 workers, mainly in the extraction of gems, gold, diamond and mineral aggregates for the civil construciton sector	IBRAM 2017e, data for 2011, http://www.ibram.org.br/sites/1400/1457/00000364.pdf

Job multiplier in the extractive industries (UNCTAD 2015)

Country	Job Multiplier
Brazil	no data
Scotland	2.5
USA	5.0
Chile	7.0
Ghana	28.0

Reference:

- UNCTAD (2015): 17th Africa OilGasMine: Extractive Industries and Sustainable Job Creation. Internet: http://unctad.org/meetings/en/SessionalDocuments/suc_OilGasMine2015_bgNote_en.pdf (last visited 08.05.2017).
- IFC (2013): IFC Jobs Study Assessing Private Sector Contributions to Job Creation and Poverty Reduction. Internet: https://www.ifc.org/wps/wcm/connect/0fe6e2804e2c0a8f8d3bad7a9dd66321/IFC_FULL+JOB+STUDY+REPORT_JAN2013_FINAL.pdf?MOD=AJPERES (last visited 08.05.2017).

Economic contribution from mining

STRADE

Resource Endowment and Reserves

Parameter	Global ranking
Fraser Institut: Best Practices Mineral Potential Index: This index is based on a survey and ranks the jurisdictions based on which region's geology "encourages exploration investment" or is "not a deterrent to investment", assuming their policies are based on "best practices" . (Rank 1 is the highest ranking. Rank 104 is the lowest ranking)	54/104
Further indexes giving information on the potential size of future mining projects, the country's mining experience and potential tier 1 assets: *to be discussed with STRADE partners and advisory board.*	

Production and Reserves

Commodity	Annual Production 2014 (USGS 2017, BGS 2017)		Reserves 2013 (USGS 2017)		Static Lifetime
	[%] of global Production	[t]	[%] of global reserves	[t]	Years
Tantalum & Niobium	92,3	280.400	95	4.100.050	15
Bauxite	13,6	35.409.900	9	2.613.300.000	74
Iron ore	10,2	345.800.000	18	15.962.000.000	46
Talc	7,37	600.000	41	18.000.144	30
Tin	4,8	17.000	15	699.840	41
Manganese	4,6	2.498.220	10	54.150.000	22
Nickel	4,2	85.600	11	9.072.000	106
Natural graphite	3,7	78.460	36	39.999.540	510
Cobalt	2,7	3.500	1	84.521	24
Gold	2,7	80	4	2.382	30
Aluminium	1,8	962.000	9	569.699.400	592
Lithium	1,2	8.000	0,4	54.316	7
Magnesite	1,2	550.000	4	86.040.000	156

References:

- Fraser Institut (2017): Fraser Institute Annual Survey of Mining Companies 2016 https://www.fraserinstitute.org/sites/default/files/survey-of-mining-companies-2016.pdf (02.05.2017)

Note: The report and its rankings are based on 350 respondents from mining and exploration companies to the global survey.

Economic contribution from mining

Basic data on the economy

Parameter	Value	Reference
Population (Number of People)	*207.847.528*	World Bank 2017d
Population density (People / km2)	*25*	World Bank 2017d
GDP (Gross Domestic Product) (Million US$)	*1.774.725*	World Bank 2017d
GDP per capita (US$)	*8539*	World Bank 2017d
Poverty rate (% of population with less than US$ 2 a day, PPP)	*7 %*	OECD 2015, data for 2013
Foreign direct investment, net inflows (including all sectors)	75 billion US$ 4.2% of GDP	World Bank 2017a World Bank 2017b

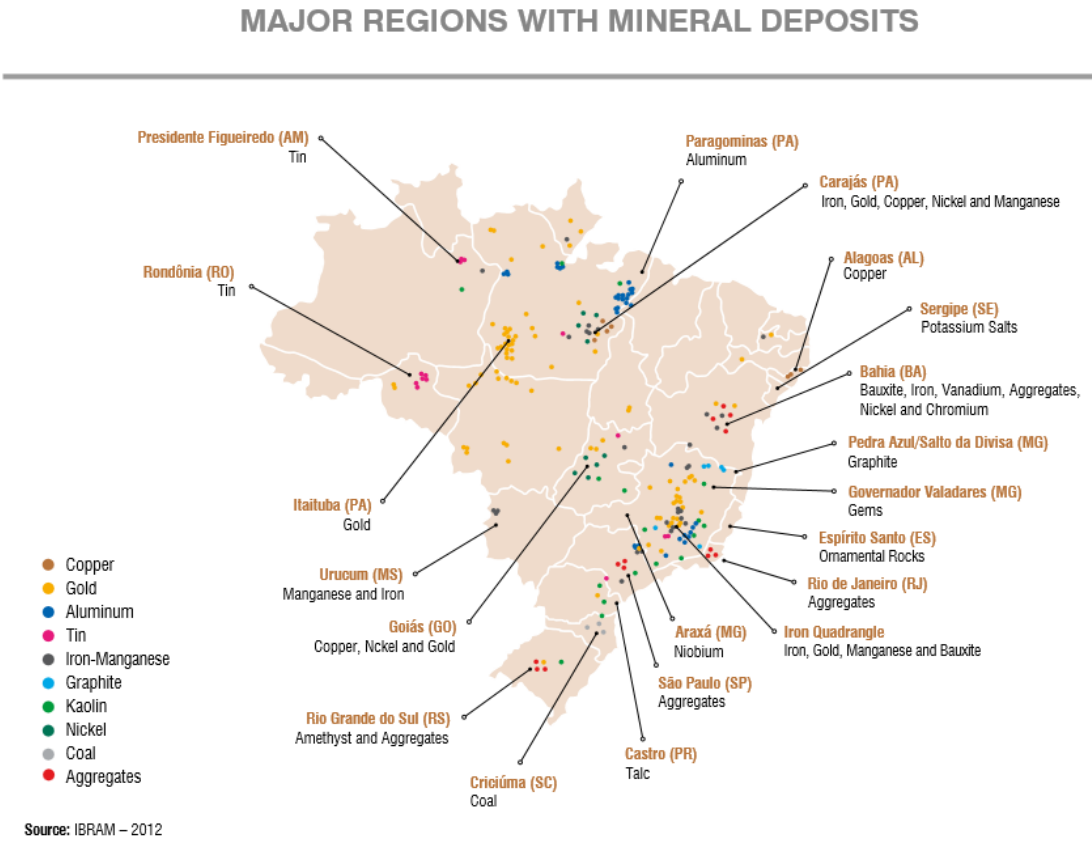
References:

- World Bank (2017d): World Development Indicators: http://data.worldbank.org/data-catalog/world-development-indicators (25.04.2017).
- EBRD (2017): EBRD: Annual Transition Reports and country fact sheets. Internet: http://2016.tr-ebrd.com/countries/ (last visited 08.05.2017)
- UN Statistics Division (2017): https://unstats.un.org/unsd/demographic/products/vitstats/ (last visited 18.04.2017)
- National statistic offices

2. Production and trade

PRODUCTION – Mining

Overview



Source: http://www.ibram.org.br/sites/1400/1457/00000364.pdf

Mine production

	Unit	Fe	Cu	Ni	…
Production 2016	Mio. t/a	254	…	…	…
Production 2016	Mio. USD/a	28 296	…	…	…
Static lifetime*	a	47	…	…	…

*Static lifetime = Reserves / mine production in 2016
Brazil is the second largest iron ore producer

Sources:
Mine Production in t / a (USGS 2017 Mineral Commodity Summaries); for Fe iron ore content is used
Production in USD: SNL

PRODUCTION – Mining

Mining sites and mining companies

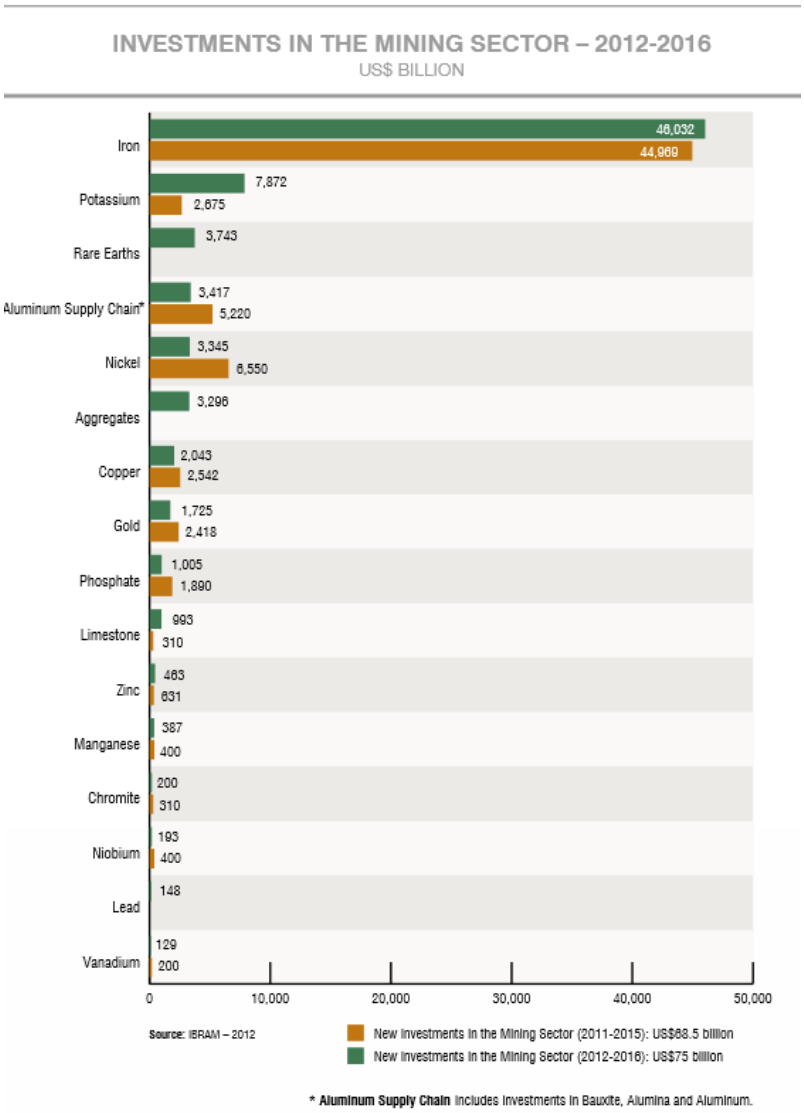
Selected major mining systems

	Fe			Cu			Al		
	Carajas, State of Para (3 mines)								
Company name	Vale SA								
Yearly mine production (t/a)	148 mio. t (2016)								
Domestic /foreign company	Domestic								
State-owned / private / enterprise	Privat								
Membership in reporting and responsible mining initiatives (e.g. IRMA, ASI, etc)	GRI, ISO,UN Global Compact								
Company information	http://www.vale.com/EN/investors/information-market/annual-reports/20f/20FDocs/Vale_20-F_FY2016_-_i.pdf http://www.vale.com/hotsite/Style%20Library/RelatorioSustentabilidade/Docs/Vale%20Sustainability%20Report%202016.pdf								

Additional remark:
Further Reading: Overview of State Ownership in the Global Minerals Industry (http://siteresources.worldbank.org/INTOGMC/Resources/GlobalMiningIndustry-Overview.pdf)

PRODUCTION – Mining and exploration

Investment in Mining



Source: IBRAM 2017e, http://www.ibram.org.br/sites/1400/1457/00000364.pdf

Further reading:
New investment projects in crude steelmaking by economy are provided on http://www.oecd.org/sti/ind/steelcapacity.htm

Parameter	Value	Reference
Exploration spent relative to production value[1]	0,4 x	ICMM (2014)

[1] = country share of world exploration budget / country share of world production value; a value of 1 means that exploration and production are balanced according to global average exploration spendings and production values. The lower the value (less than 1) the less the share in global exploration than in global production.

PRODUCTION – Smelting & Refining

Refining capacities and major smelters & refiners

Commodity	Membership in sustainable initiatives	Unit	Steel	…
Total refining capacity		mio. t	48.4	
Major smelters & refiners:				
Companhia Siderúrgica Nacional (CSN)	ISO	mio. t	5.6	
Gerdau S.A.	…	…	…	
Smelter x	…	…	…	
Smelter x	…	…	…	
Smelter x	…	…	…	

Additional remark / sources:
Total existing crude steel capacity: USGS 2016: Minerals Yearbook Brazil
https://minerals.usgs.gov/minerals/pubs/country/2013/myb3-2013-br.pdf
CSN: ttp://www.csn.com.br/conteudo_eni.asp?idioma=1&conta=46&tipo=59621
Gerdau: https://www.gerdau.com/br/en#

Metal & intermediate production

Commodity	Metal production
	t / a
Crude steel	33.3 mio.t / 2015
Refined copper	…
Refined nickel	…
…	

Reference:
Brazil Steel institute (http://www.acobrasil.org.br/site2015/eng/dados.asp)

TRADE - Export

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Brazilian ore exports

	Unit	Fe	Cu	…
Ore export (Brazil ⇨ global)	mio t/a	344		
Ore export (Brazil ⇨ global)	mio USD/a	25 800		
Ore export in EU (Brazil ⇨ global)	mio t/a	54.7		
Ore export in EU (Brazil ⇨ global)	mio USD /a	5 788		
Total ore export (t) / domestic ore production (t)	%	84%		
Brazilian's contribution to EU iron ore imports from global suppliers:				
Ore export to EU (value) / total EU ore import (value)	%	48%		
Relevance of Brazilian exports to EU for Brazil:				
Ore export to EU (t) / total ore export (t)	%	16 %		

Reference:
COMTRADE (https://comtrade.un.org/data) ; HS 2601 (ore export)
Eurostat Trade data (import EU 28) http://epp.eurostat.ec.europa.eu/newxtweb/mainxtnet.do
Data for iron 2014

Additional remarks:

TRADE - Export

Brazilian exports of selected intermediate products

	Fe		Cu		…
	t/a	Mio USD/a	t/a	USD/a	
Exports of semi-finished products of iron or non-alloyed steel:					
Export intermediate product (1) (global)	6.9 mio t	2,3 mio USD			
Export intermediate product (1) (to EU)	0.98 mio t	351 mio EUR			
Worldwide EU import intermediate product (1)	7.8 mio t	2,6 mio EUR			
Exports of …					
Export intermediate product (2) (global)	…	…			
Export intermediate product (2) (EU)	…	…			
Worldwide EU import intermediate product (2)	…	…			

Reference /sources:
(1): semi-finished products of iron or non-alloy steel - HS 7207: COMTRADE (https://comtrade.un.org/data); export to used data eurostat (import EU)

Additional remark:

TRADE - Import

This issue should be elaborated within other projects. It is not a focus of the STRADE project.

TRADE – Trade agreements & trade restrictions

STRADE

Trade agreements

Free Trade Agreements:

- The EU is negotiating a free trade agreement with Brazil. This is part of the EU's Association Agreement negotiations with the Mercosur countries (which also includes Argentina, Uruguay and Paraguay). (EC 2017a)

Trade restrictions (not limited to mining)

	Brazil
Export tariffs on minerals	0 %
Export tariffs on intermediate products	0 %

Reference / sources:
WITS
OECD tool

Secondary material flows

This issue should be elaborated within other projects. It is not a focus of the STRADE project.

PRODUCTION – Business environment

"Ease to do business" – The Competitive Index

	Brazil
	Rank (1 = best ranking; 138 = worst ranking)
Institutions	120
Infrastructure	72
Macroeconomic environment	126
Health and primary education	99
Higher education and training	84
Goods market efficiency	128
Labor market efficiency	117
Financial market development	93
Technology readiness	59
Market size	8
Business sophistication	63
Innovation	100

Explanatory note:
The higher the rank (1) and value (e.g. 5.8), the better the competitiveness (e.g. Switzerland has the highest rank (1) and value (5.8) in innovation and sophistication factors; Mauretania is ranked lowest at 138 (value 1.9) in higher education and training)

Reference:
World Economic Forum: The Global Competitiveness Report 2016-2017, 2016 (https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1)

3. Governance

Governance

World Bank – Worldwide Governance Indicators

**not mining specific, refers to all sectors*

The WGI cover over 200 countries and territories, measuring six dimensions of governance starting in 1996: Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption. The aggregate indicators are based on several hundred individual underlying variables, taken from a wide variety of existing data sources. The data reflect the views on governance of survey respondents and public, private, and NGO sector experts worldwide. The WGI also explicitly report margins of error accompanying each country estimate. These reflect the inherent difficulties in measuring governance using any kind of data. Even after taking these margins of error into account, the WGI permit meaningful cross-country and over-time comparisons (Kaufmann et al. 2010).

Indicator	Governance score Highest performance: +2.5 Lowest performance: -2.5	Percentile Rank Highest rank: 100 Lowest rank: 0	Number of used data sources
Voice and Accountability	0.38	60.10	14
Political Stability and Absence of Violence/Terrorism	-0.38	34.29	9
Government Effectiveness	-0.19	47.60	11
Regulatory Quality	-0.21	46.63	11
Rule of Law	-0.19	50.00	15
Control of Corruption	-0.43	41.35	12

Reference:
World Bank (2017): Worldwide Governance Indicators. Internet: http://info.worldbank.org/governance/wgi/#reports (last visited 08.05.2017).

Further Reading:
Kaufmann D., A. Kraay, and M. Mastruzzi (2010): The Worldwide Governance Indicators: Methodology and Analytical Issues. Internet: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1682130 (last visited 08.05.2017).

Governance

Transparency

EITI

The EITI is a standard by which information on the oil, gas and mining industries is published. The EITI is not a prescription for governance of the extractive sector, rather a tool that informs the way the sector is governed.(EITI 2017).

Membership	Since
No	-

BEPS (OECD 2013)

Base erosion and profit shifting (BEPS) refers to tax avoidance strategies that exploit gaps and mismatches in tax rules to artificially shift profits to low or no-tax locations. Under the inclusive framework, over 100 countries and jurisdictions are collaborating to implement the BEPS measures and tackle BEPS. (OECD 2017b)

OECD categorisation	Definition	categorisationof Brazil's BEPS Actions (Deloitte 2017)
Minimum standard	All G20/OECD members are committed to consistent implementation	A5, A6, A13, A14
Revision of existing standard		A7,A8,A9,A10
Common approach	Common approaches to facilitate convergence of national practices	A1,A2,A4,
Best practice	Guidance drawing on best practices	A3,A12

Reference:

- EITI (2017): EITI. Internet: https://eiti.org/ (last visited 08.05.2017).
- OECD (2013): Action Plan on Base Erosion and Profit Shifting, OECD Publishing. Internet: http://dx.doi.org/10.1787/9789264202719-en (last visited 08.05.2017).
- OECD (2017b): Base erosion and profit shifting. Internet: http://www.oecd.org/tax/beps/ (last visited 10.05.2017).
- Deloitte (2017): BEPS Actions implementation by country – Brazil. Internet: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-beps-actions-implementation-brazil.pdf (last visited 10.05.2017).

Alternative transparency schemes:

- alternative initiatives / Instruments to EITI that cover similar information?

Governance

EITI Requirements Ghana's Progress

EITI Requirements		Level of Progress				
Categories	Requirements	No Progress	Inadequate	Meaningful	Satisfactory	Beyond
MSG oversight	Government engagement (#1.1)				■	
	Industry engagement (#1.2)				■	
	Civil society engagement (#1.3)				■	
	MSG governance (#1.4)				■	
	Workplan (#1.5)				■	
Licenses and contracts	Legal framework (#2.1)				■	
	License allocations (#2.2)				■	
	License register (#2.3)			■		
	Policy on contract disclosure (#2.4)				■	
	Beneficial ownership (#2.5)					
	State participation (#2.6)			■		
Monitoring production	Exploration data (#3.1)				■	
	Production data (#3.2)			■		
	Export data (#3.3)			■		
Revenue collection	Comprehensiveness (#4.1)			■		
	In-kind revenues (#4.2)			■		
	Barter agreements (#4.3)					
	Transportation revenues (#4.4)					
	SOE transactions (#4.5)			■		
	Direct subnational payments (#4.6)				■	
	Disaggregation (#4.7)				■	
	Data timeliness (#4.8)				■	
	Data quality (#4.9)				■	
Revenue allocation	Revenue management and expenditures (#5.1)				■	
	Subnational transfers (#5.2)				■	
	Distribution of revenues (#5.3)					
Socio-economic contribution	Mandatory social expenditures (#6.1.a)					
	Discretionary social expenditures (#6.1.b)					
	SOE quasi-fiscal expenditures (#6.2)			■		
	Economic contribution (#6.3)				■	
Outcomes and impact	Public debate (#7.1)				■	
	Data accessibility (#7.2)					
	Follow up on recommendations (#7.3)				■	
	Outcomes and impact of implementation (#7.4)				■	
Overall assessment				■		

EITI (2017b): GHEITI Ghana Extractive Industires Transparency Initiatve. Internet: https://eiti.org/ghana#overview (last vsisted 10.05.2017).

Governance

Attractiveness from mining and exploration companies' perspective according to Fraser Institute's survey

Index	Global ranking
Policy Perception Index (PPI): The PPI is a composite index that measures the overall policy attractiveness of the 104 jurisdictions in the survey. The index is composed of survey responses to policy factors that affect investment decisions. Policy factors examined include uncertainty concerning the administration of current regulations, environmental regulations, regulatory duplication, the legal system and taxation regime, uncertainty concerning protected areas and disputed land claims, infrastructure, socioeconomic and community development conditions, trade barriers, political stability, labor regulations, quality of the geological database, security, and labor and skills availability. (Rank 1 is the highest ranking. Rank 104 is the lowest ranking) *final version with global MAP on PPI*	64/104

References:

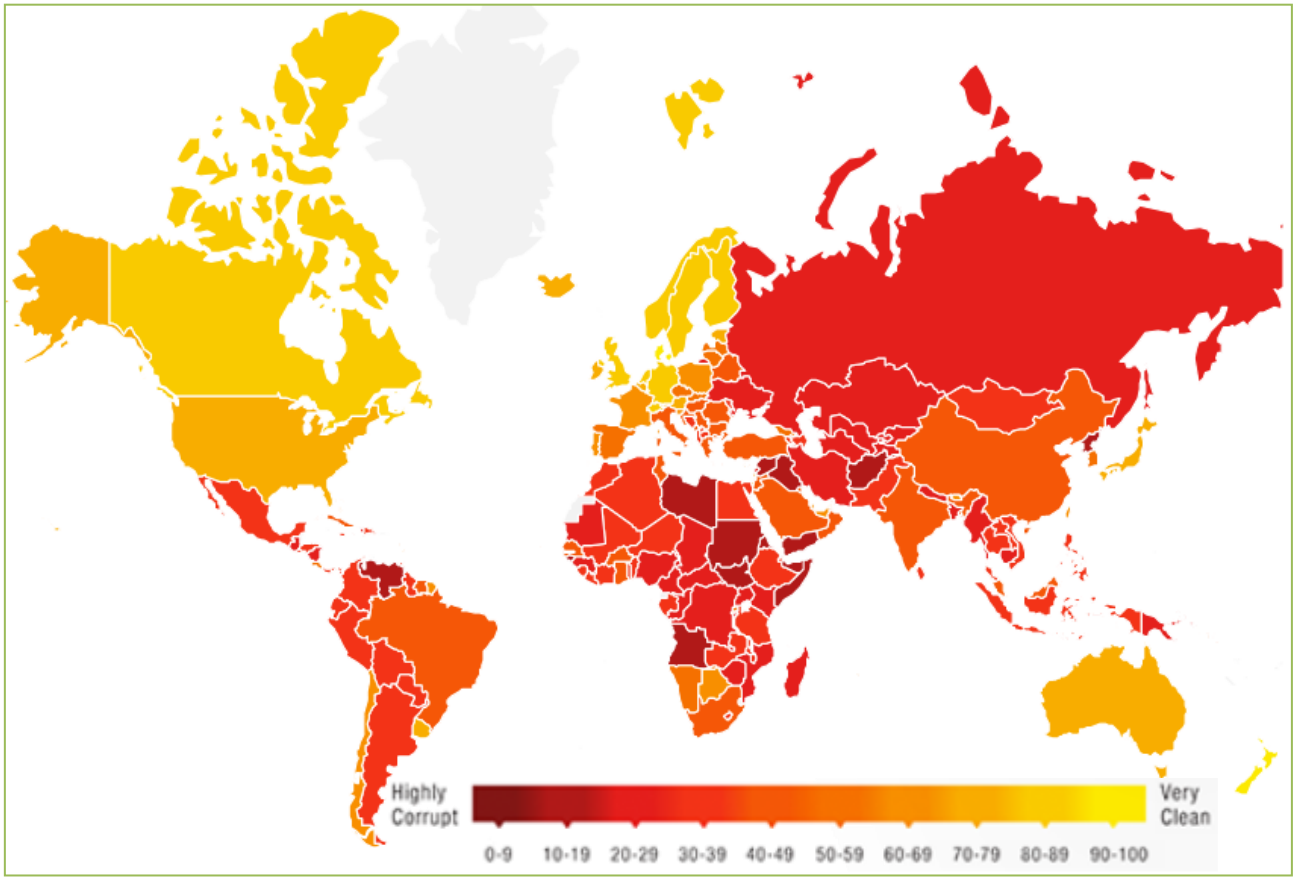
- Fraser Institut (2017): Fraser Institute Annual Survey of Mining Companies 2016 https://www.fraserinstitute.org/sites/default/files/survey-of-mining-companies-2016.pdf (02.05.2017)

Note: The report and its rankings are based on 350 respondents from mining and exploration companies to the global survey.

Governance

Transparency International's Corruption Perceptions Index 2016

The Corruption Perceptions Index aggregates data from a number of different sources that provide perceptions of business people and country experts of the level of corruption in the public sector. The CPI 2016 is calculated using 13 different data sources from 12 different institutions that capture perceptions of corruption within the past two years (Transparency International 2017).



Score	Rank
40/100	79/176

Reference:
Transparency International (2017): Corruption Perceptions Index 2016. Internet: http://www.transparency.org/news/feature/corruption_perceptions_index_2016 (last visited 08.05.2017).

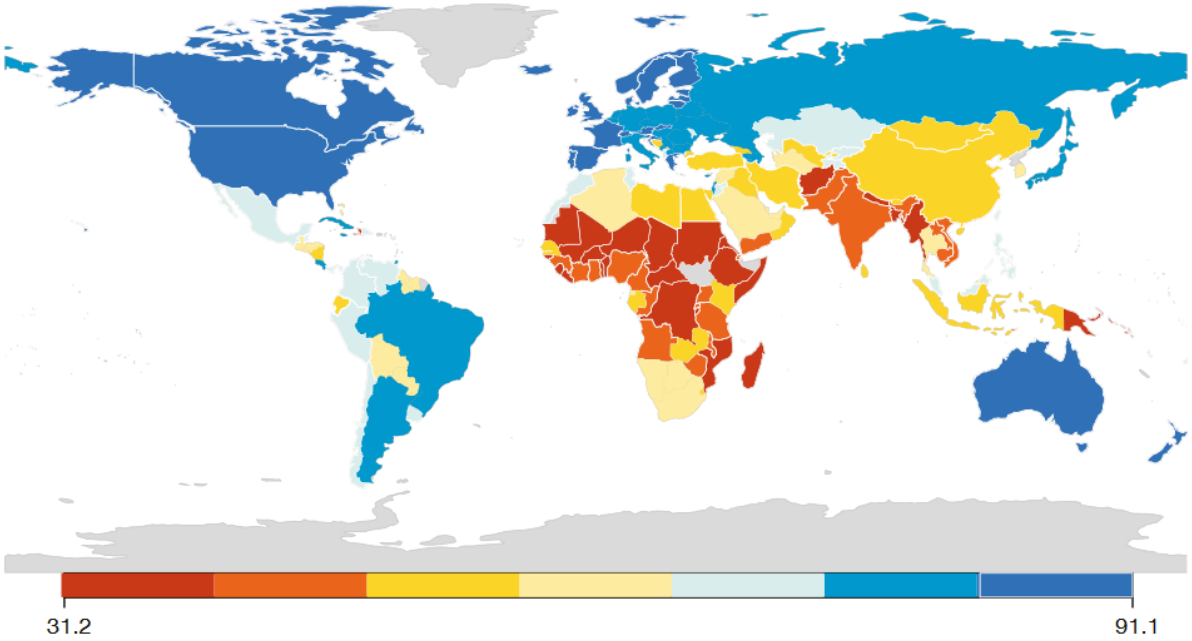
Parameter	Value	Reference
Bribery incidence (% of firms experiencing at least one bribe payment request)	-	World Bank 2017d

Governance

Environmental Performance Index

The Environmental Performance Index (EPI) ranks countries' performance on high-priority environmental issues in two areas: protection of human health and protection of ecosystems. Within these two policy objectives the EPI scores national performance in nine issue areas comprised of more than 20 indicators (see EPI Framework). EPI indicators measure country proximity to meeting internationally established targets or, in the absence of agreed targets, how nations compare to one another. (Yale University 2016)

Figure 24: Global 2016 EPI results range from a score of 31.2 to 91.1, with 100 being the best score and 0 the worst.

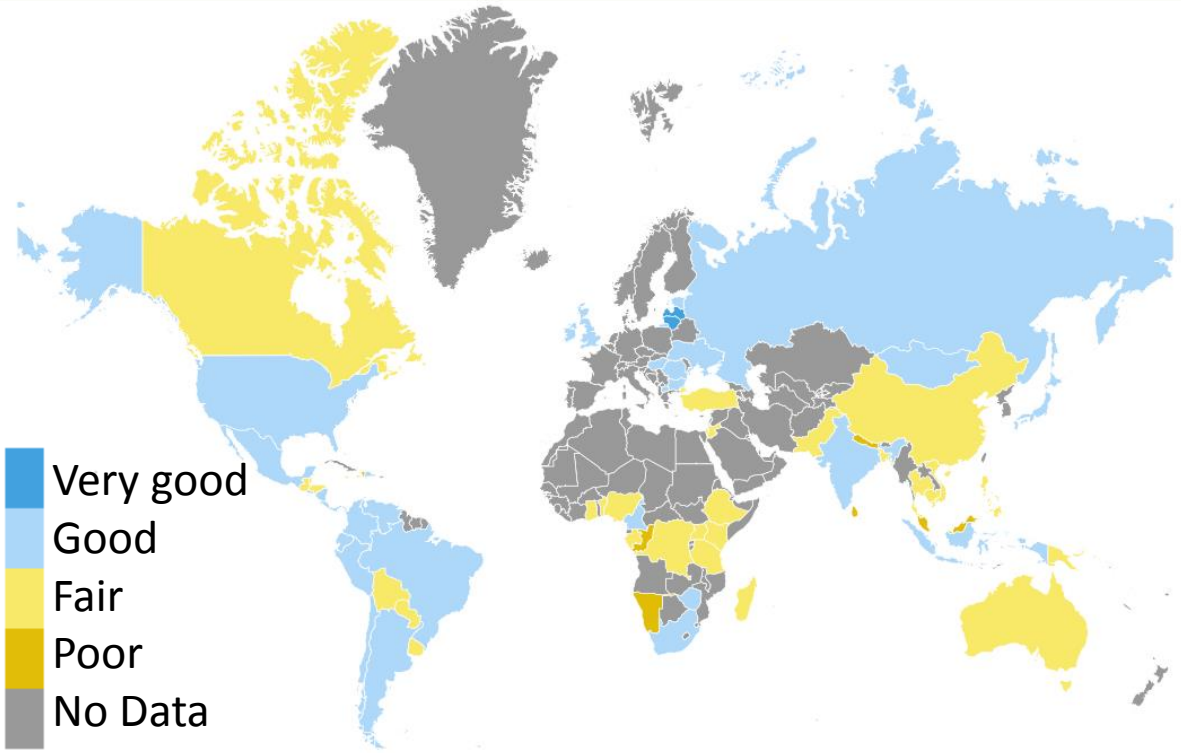


Reference:
Yale University (2016): Global Metrics For The Environment The Environmental Performance Index ranks countries' performance on high-priority environmental issues. http://epi.yale.edu/sites/default/files/2016EPI_Full_Report_opt.pdf (last visited 25.04.2017).

Governance

Environmental Democracy Index

"The Environmental Democracy Index was developed by The Access Initiative (TAI) and World Resources Institute (WRI) in collaboration with partners around the world. The index evaluates 70 countries, across 75 legal indicators, based on objective and internationally recognized standards established by the United Nations Environment Programme's (UNEP) Bali Guidelines. EDI also includes a supplemental set of 24 limited practice indicators that provide insight on a country's performance in implementation. The national laws and practices were assessed and scored by more than 140 lawyers around the world. Country assessments were conducted in 2014 and will be updated every two years. Scores are provisional until September 15th, 2015 as results are being shared with governments and civil society for feedback until July 15." (TAI & WRI 2017)



Reference:
The Access Initiative & World Resources Institute (2017): Environmental Democracy Index. Internet: http://www.environmentaldemocracyindex.org/ (last visited 25.04.2017).

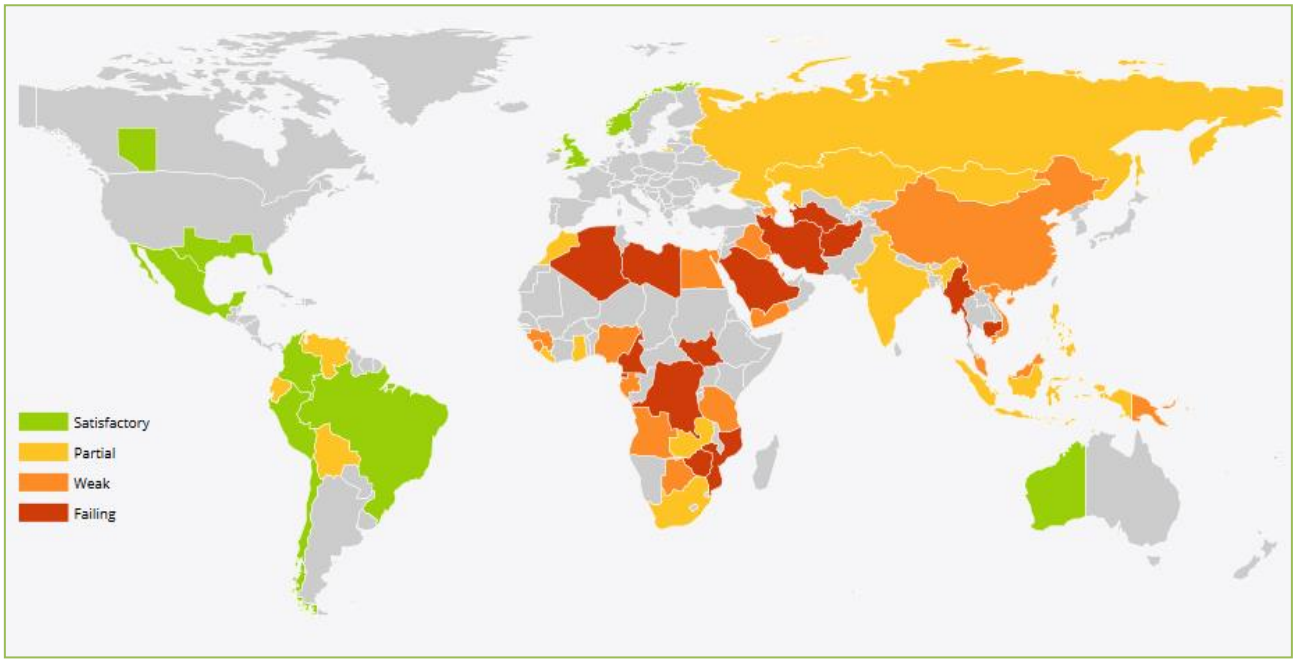
Access to information	Public participation	Access to justice	Country score
2.3	1.04	2.03	**1.8**
Note: 0 lowest score, 3 highest score			

Governance

Natural Resource Governance Index

"The RGI scores and ranks […] countries, relying on a detailed questionnaire completed by researchers with expertise in the extractive industries. The Index assesses the quality of four key governance components: Institutional and Legal Setting; Reporting Practices; Safeguards and Quality Controls; and Enabling Environment. It also includes information on three special mechanisms used commonly to govern oil, gas and minerals—state-owned companies, natural resource funds and subnational revenue transfers" (NRGI 2017).

NRGI Composite Score –Global Comparison (NRGI 2017)



Score Brazil (NRGI 2017b)

Rank out of (58)	Component	Score (out of 100)
8	Institutional & Legal Setting	81
9	Reporting Practices	78
2	Safeguards & Quality Controls	96
9	Enabling Enviornment	66
5	**Composite Score**	**80**

References:

- NRGI (2017): Resource Governacne Index. Internet: http://www.resourcegovernance.org/resource-governance-index (10.05.2017).
- NRGI (2017b): Brazil's Performance on the Resource Governance Index Internet: http://www.resourcegovernance.org/our-work/country/brazil (last visited 10.05.2017).

NRGI Methodology (NRGI 2017c)

- **Institutional & Legal Setting:**

  10 indicators that assess whether the laws, regulations and institutional practices enable comprehensive disclosures, open and fair competition, and accountability.

- **Reporting Practices:**

  20 indicators that evaluate the actual disclosure of information and reporting practices by government agencies.

- **Safeguards and Quality Controls:**

  15 indicators that measure the checks and oversight mechanisms that guard against conflicts of interest and undue discretion, such as audits.

- **Enabling Environment:**

  5 indicators of the broader governance environment generated using over 30 external measures of accountability, government effectiveness, rule of law, corruption and democracy. The data reflect the extent to which the broader environment will help or hinder transparency and accountability efforts in the extractive sector. Box 1 below summarizes the discussion about including the enabling environment component in the Index.

References:

- NRGI (2017c):
- Resource Governance Index: Methodology. Internet: http://www.resourcegovernance.org/resource-governance-index/methodology (10.05.2017).

Governance

Further Reading

Further Reading:

- OECD (2017): OECD Corporate Governance Factbook 2017. Internet: http://www.oecd.org/daf/ca/Corporate-Governance-Factbook.pdf (last visited 08.05.2017)
- World Economic Forum (2016): The Global Competitiveness Report 2016–2017. Internet: http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf (08.05.2017).
- Federal Ministry for Economic Cooperation and Development of Germany (): Natural Resource Contracts as a Tool for Managing the Mining Sector. Internet: http://ccsi.columbia.edu/files/2015/07/Natural-Resource-Contracts-as-a-Tool-for-Managing-the-Mining-Sector.pdf (last visited 10.05.2017).

Governance

The Mining Investment and Governance Review (MInGov)

Slide not ready - not relevant for Brazil

The Mining Investment and Governance Review (MInGov) gives government and regional public organizations access to policy and institutional analyses that affect the sustainable development of the mining sector, including its investment climate, effectiveness of public institutions in developing and monitoring the sector, as well as the costs and benefits to stakeholders.
Investors, mining companies and other companies in the sector benefit from access to country-specific, relevant governance data, policies and practices of governments that affect investment risk and decision-making in the sector.
MInGov provides civil society organizations, local communities, academia, development partners and sector monitoring organizations concise, high-quality information on government, mining, and investor concerns and performance. They also get access to a comprehensive overview of the operating climate and the incentive structure of the sector to inform their participation in mining sector-related discussions. (World Bank 2017e)

Example Data Peru *(tbd: further explanation of the table!)*

Theme	Max	Min	Average
A. Policy, Legislation and Regulation	4,00	1,00	3,69
B. Accountability and Inclusiveness	4,00	1,00	3,03
C. Institutional Capacity and Effectiveness	4,00	1,00	3,07
D. Economic Environment	4,00	1,00	2,90
E. Political Environment	4,00	2,00	2,87
F. Sustainable Development	4,00	1,00	2,65
M. Mining Sector Importance	4,00	1,00	2,22

Reference:
- World Bank (2017e): The Mining Investment and Governance Review (MInGov). Internet: http://www.worldbank.org/en/programs/mingov#1 (last visited 08.05.2017).

4. Human rights

Recent violent conflicts with the involvement of the mining sector

The conflict barometer of the Heidelberg Institute for International Conflict Research maps and evaluates non-violent and violent conflicts world-wide. Violent conflicts are divided into violent crisis, limited war and war (with increasing intensity). The country profiles only include violent conflicts, which is based on the consideration that the analysis does a) not exhaustively cover all non-violent conflicts, and b) that non-violent conflicts can often be seen as part of normal societal processs balancing the interests of different stakeholder groups.

Start year	Ore type	Location	Parent company	Intensity	Conflict parties	Conflict items
1996	No mining specific conflict	São Paulo / Paraná state		Violent crisis	MST*, MTST** vs. government	Land use***
Tbd: Example for conflicts related to mining in Brazil.						

* MST: Landless Workers´ Movement
** MTST: Homeless Workers´ Movement
*** The conflict is mainly about land reforms and land rights in general. So far no mining sites / specific raw materials were addressed in the conflict.

Reference:

- Heidelberg Institut for International Conflict Research – Conflict Barometer 2016
http://hiik.de/de/konfliktbarometer/pdf/ConflictBarometer_2016.pdf
(last visited 27.04.2017)

Further reading:

- International Crisis Group – The monthly CrisisWatch provides a regular up-date on significant conflicts world-wide.
https://www.crisisgroup.org/fr (last visited 28.04.2017)

Further information on conflicts

There are manifold reports and data sources on conflicts available, which provide varying degrees of details on individual conflicts, their history, dynamics and drivers. Nevertheless, it is often difficult to evaluate the credibility and objectiveness of such sources. In many cases, reports on individual conflicts are biased and do not provide holistic analysis of issues and drivers.

The media presence of conflicts cannot be seen as meaningful indicator of the severity of the conflict because the media presence highly depends on the level of public awareness and the extent of public campaigns.

Human Rights Information

Prevalence of child labour (in all sectors, not mining-specific)

The UNICEF Child labour database comprises existing data on the prevalence of child labour per country. Child labour is defined as the "Percentage of children 5–14 years old involved in child labour at the moment of the survey. A child is considered to be involved in child labour under the following conditions: (a) children 5–11 years old who, during the reference week, did at least one hour of economic activity or at least 28 hours of household chores, or (b) children 12–14 years old who, during the reference week, did at least 14 hours of economic activity or at least 28 hours of household chores." The data is based on Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS) and other nationally representative surveys.

Prevalence of child labor	Source
8 %*	IBGE PNAD 2014
*Data differ from the standard definition or refer only to the country-specific section	

Prevalence of forced labour (in all sectors, not mining-specific)

The Global Slavery Index is published by the Walk Free Foundation and comprises a vulnerability model based on the four dimensions: civil and political protections; social health and economic rights; personal security and refugee populations and conflict. Each of the dimensions consist of further variables. Altogether the vulnerability model is based on the evaluation of 24 variables. A higher score indicates a higher level of vulnerability. The vulnerability model is the basis for an estimation of prevalence of forced labour [% of population] per country, which is also published in the report.

Civil and political protections	Social health and economic rights	Personal security	Refugee populations and conflict	Mean	Prevalence of forced labour [% of population]
38	20	46	31	34*	0.08 %
* Values range between 17 (Denmark) and 67 (Afghanistan)					

Reference:
UNICEF Child labour database
https://data.unicef.org/topic/child-protection/child-labour/ (last visited 27.04.2017)
Walk Free Foundation – The Global Slavery Index 2016
http://www.globalslaveryindex.org/download/ (last visited 27.04.2017)

Recognition of the Core Labour Standards of the ILO

(relevant for all sectors, not mining-specific)

Core labour standard	Ratified	In Force
Freedom of Association and Protection of the Right to Organise Convention (No 87)		
Right to Organise and Collective Bargaining Convention (No 98)	X	X
Forced Labour Convention (No 29)	X	X
Abolition of Forced Labour Convention (No 105)	X	X
Minimum Age Convention (No 138)	X	X
Worst Forms of Child Labour Convention (No 182)	X	X
Equal Remuneration Convention (No 100)	X	X
Discrimination (Employment and Occupation) Convention (No 111)	X	X

Recognition of further ILO Standards

Core labour standard	Ratified	In Force
Indigenous and Tribal Peoples Convention (No. 169)	X	X
Safety and Health in Mines Convention (No. 176)	X	X

Further reading:

- Max Planck Foundation (2016) Human Rights Risks in Mining – A Baseline Study (Commissioned by BGR) https://www.bmz.de/rue/includes/downloads/BGR_MPFPR__2016__Human_Rights_Risks_in_Mining.pdf (last visited 27.04.2017).

References:

- International Labour Organisation – Ratifications per country http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11200:0::NO::P11200_COUNTRY_ID:102571 (last visited 28.04.2017)

Human rights information

Responsible Mining Index evaluation on socio-economic mine site performance

Company	Location	Ore	RMI evaluation on human rights and social performance	Reference year	Details
The content and the structure of this table will be discussed in detailed when first RMI data are published (scheduled in 2018)					

Reference:
The Responsible Mining Foundation (2017): http://responsibleminingindex.org/ (last visited 11.05.2017).

5. Environmental issues

Environmental issues

Recent tailing dam failures and accidents

Year	Ore type	Location	Parent company	Type of incident	Release	Impacts
2015			Samarco	Tailings Dam Failure	32 million m^3	Flooded town; 17 persons killed; polluted rivers on a distance of 663 km

Reference:
WISE – World Information Service on Energy: http://www.wise-uranium.org/mdaf.html
ICOLD – International Commission on large dams: http://www.icold-cigb.net/

Recent pipeline spills and treatment failures

	Location	Company	Description	Impact	Reference
Pipeline Spills[2,3]	Location 1				
	Location 2				
	Location 3				
Treatment Failures[2,3]	Location 1				
	Location 2				
	Location 3				

Reference:
Earthworks (2012) [USA specific]
Schoproni et al. (2014) [Brazil socific]

Further reading:

- IFC (2014): Water, Mining And Communities: Creating Shared Value through Sustainable Water Management https://commdev.org/userfiles/IFC_140201_Water%20Mining%20Communities_0519c%20web.pdf (last visited 18.04.2017).

Environmental issues

Location specific risks / natural disaster risks

Methodologies to assess and classify natural disaster risks of mining sites are currently developed in the ÖkoRess Project financed by German Environment Agency. The methodologies use data on specific local risks for their risk classification. Relevant documents will soon be published under: https://www.umweltbundesamt.de/umweltfragen-oekoress

	Data source for local data	Fe			Cu		Al	
Selected major Mines	USGS (2005)	Mine 1	Mine 2	…	Mine 1	…	Mine 1	….
Water Stress Index	Pfister et al. (2009)	Low/ medium/ high						
Mine within protected or close-by to Protected Areas	IUCN / UNEP-WCMC (2017) & Alliance for Zero Extinction (2010)	No/ Close-by / within						
Risk for Earthquakes	Helmholtz-Zentrum Potsdam (2000)	Low/ medium/ high						
Risk for Tropical Storms	UNISDR (2015)	Low/ medium/ high						
Risk for floods	CIMA Foundation and UNEP-GRID	Low/ medium/ high						

Further reading:

- United Nations Office for Disaster Risk Reduction (2015): Global Assessment Report on Disaster Risk Reduction 2015. http://www.preventionweb.net/english/hyogo/gar/2015/en/home/data.php?iso=BRA (last visited 18.04.2017)
- OECD (2008): Key Environmental Indicators. Internet: https://www.oecd.org/env/indicators-modelling-outlooks/37551205.pdf (last visited 18.04.2017).

Environmental issues

Responsible Mining Index evaluation on environmental mine site performance

Company	Location	Ore	RMI evaluation on environmental performance	Reference year	Details
The content and the structure of this table will be discussed in detailed when first RMI data are published (scheduled in 2018)					

Reference:
The Responsible Mining Foundation (2017): http://responsiblemininingindex.org/ (last visited 11.05.2017).

Environmental issues

Water and air emissions

The current draft proposal for the country profiles does not include quantitative data on water and air emissions due to the lack of meaningful data.

Existing aggregated data such as water use by sector or greenhouse gas emissions by sector, which are partly available on country basis, do not allow conclusions on the major environmental challenge: the level of ecological harm due to hazardous substances in the distinct environmental media (air, groundwater, soil, surface water etc.). These data are only punctually available for some mining sites.

The authors propose to focus in the first development stage of the country profiles on alternative approaches such as the occurrence of tailing dam and pipeline failures and the regional water stress (see previous tables).

Environmental issues

Further information

Further information on environmental issues are included in other section of the country profiles:

- Environmental Performance Index: see section on governance (link).
- Association with radioactive substances: see raw material profiles
- Association with heavy metals: see raw material profiles
- Process chemicals use: see raw material profiles
- Potential for Acid Mine Drainage: see raw material profiles
- Mining type: see raw material profiles
- Mining method: see raw material profiles

List of weblinks and literature for further reading on recent other environmental hazards in the mining sector

The following list is meant to encourage further reading. The reader has to assess itself the quality and credibility of the information. Further, it does not claim completeness.

- Environmental Justice Map: https://ejatlas.org/
- *further ideas for links?*

6. Initiatives for responsible mining and development

Initiatives for responsible mining and development

Country-specific initiatives in the extractive sector – industry, government, CSO's, multi-stakeholder

Type Initiatives / Organisations	Name	Programs	Reference
Mining Associations	IBRAM – Brazilian Mining Association	Special Program for Safety and occupational Health – MinerAÇÃO	IBRAM 2017a
		Management of Water Resources	IBRAM 2017b
		Tailing Dams Safety Program	IBRAM 2017c
		CONIM – Committee for International Mining standardization	IBRAM 2017d
Governmental programs			
ASM-related initiatives; Multi-stakeholder initiatives			
CSO activities			
Mining companies with best practice according to the Responsible Mining Index evaluation (under development)			

Note: The table is meant to encourage further analysis. The reader has to assess itself the quality and credibility of the initiatives. Further, it does not claim completeness.

Further reading:

Initiatives for responsible mining and development

Official Development Assistance and Worldbank programmes for all sectors

ODA		
ODA, net	999 US$ million 4.8 US$/capita	OECD 2017, data for 2015

ODA per sector	US $ million	% of total ODA
Economic Infrastructure	620	55
Social Infrastructure	250	22
Multi-Sector	220	19
Production	25	2,2
Admin. Consts of Donors	8	0,7
Humantitarian Aid	4	0,35
Unspecifiied	2	0,17
Debt Relief	0	0
Refugees in Donor Countries	0	0

Reference:OECD (2017): Compare Your Country. Internet: http://www2.compareyourcountry.org/aid-statistics?cr=oecd&lg=en# (last visited 24.04.2017).

Worldbank projects	
IBRD lending in 2016: US$ 758 million, in 43 projects	http://www.worldbank.org/en/country/brazil/overview#2

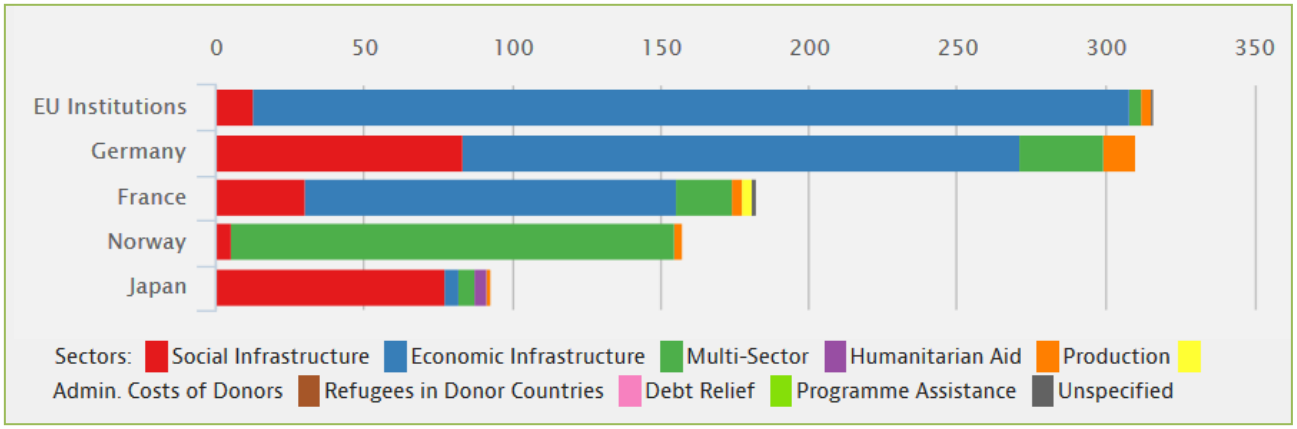
Further reading:

- OECD (2017):Geographical Distribution of Financial Flows to Developing Countries 2017. Disbursements, Commitments, Country Indicators. OECD Publishing. Paris

Initiatives for responsible mining and development

Official Development Assistance for all sectors

ODA by main donor countries and sector (OECD 2017)



Reference:

- OECD (2017): Compare Your Country. Internet: http://www2.compareyourcountry.org/aid-statistics?cr=oecd&lg=en# (last visited 24.04.2017).

Initiatives for responsible mining and development

Development Assistance in the mining sector

Projects
2011-2015 Australian Government **30 million US$** *Material efficiency in raw-materials intensive production processes* The International Mining for Development Centre aims to strengthen the capacity of targeted developing partner countries to translate resource richness into significant and sustainable economic and social benefits. (OECD 2017b)
2011-2017 World Bank **50 million US$** *Energy and Mineral Sector Strengthening* The development objective of the Energy and Mineral Sector Strengthening Project for Brazil is to improve the contribution of energy and mining resources to accelerated national economic growth and increased social and environmental sustainability in a context of globalization and technological change (World Bank 2017c)

References:

- OECD (2017): Compare Your Country. Internet: http://www2.compareyourcountry.org/aid-statistics?cr=oecd&lg=en# (last visited 24.04.2017).
- OECD (2017b): OECD Stat – Creditor Reporting System. Internet: https://stats.oecd.org/Index.aspx?DataSetCode=CRS1 (last visited 24.04.2017).
- World Bank (2017c): Projects & Operations. Internet: http://projects.worldbank.org/ (last visited 25.04.2017).

Further reading:

- OECD (2017):Geographical Distribution of Financial Flows to Developing Countries 2017. Disbursements, Commitments, Country Indicators. OECD Publishing. Paris

Initiatives for responsible mining and development

EU and member states engagement in all sectors (not limited to mining)

Frameworks / Programmes
EU National / Regional / Multiannual Indicative Programmes: (EC 2017a): • Development Cooperation Instrument (DCI) 2014-2020: Multiannual Indicative Regional Programm for Latin America (EC 2017b)
Strategic Partner Dialogue: • EU-Brazil Strategic Partnership since 2007 (EEAS 2017) • Germany and Brazil conduct a strategic partnership
Free Trade Agreements: • The EU is negotiating a free trade agreement with Brazil. This is part of the EU's Association Agreement negotiations with the Mercosur countries (which also includes Argentina, Uruguay and Paraguay). (EC 2017a) • *For more information on trade issues see section on production & trade*
European Investment Bank (EIB) funding : • currently, EIB does not fund extractive industry projects (EIB 2017)
European Bank for Reconstruction and Development (EBRD) funding: • project list see (EBRD 2017); currently no projects in Brazil

Initiatives for responsible mining and development

Cross-country raw-material specific initiatives

Commodity	Name	Link to raw material profile	Website
Aluminum	Aluminium Stewardship Inititave (in development)	see raw material profile on alluminum	ASI 2017
Iron	Responsiblesteel scheme	See raw material profile on iron	Responsiblesteel 2017

Further reading:

Initiatives for responsible mining and development

Further reading

Global Reporting Initiative:
https://www.globalreporting.org/services/Analysis/Reports_List/Pages/default.aspx
……
……

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- ASI - Aluminium Stewardship Inititave (2017): Aluminium Stewardship Inititave. Internet: https://aluminium-stewardship.org/# (24.04.2017).
- British Geological Survey BGS (2017):World Mineral Production 2011-15. Keyworth, Nottingham.
- CIMA Foundation und UNEP-GRID (Quelle!!!)
- Deloitte (2017): Corporate Tax Rates 2017. Internet: https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-corporate-tax-rates.pdf (last visited 08.05.2017)
- Earthworks (2012): U.S. Copper Porphyry Mines:The track record of water quality impacts resulting from pipeline spills, tailings failures and water collection and treatment failures. Internet: https://www.earthworksaction.org/files/publications/Porphyry_Copper_Mines_Track_Record_-_8-2012.pdf (last visited 18.04.2017).
- EC - European Commission (2017b): Trade – Countries and regions. Brazil. Internet: http://ec.europa.eu/trade/policy/countries-and-regions/countries/brazil/ (last visited 24.04.2017).
- EC - European Commission (2017a): National / Regional / Multiannual Indicative Programmes. Internet: https://ec.europa.eu/europeaid/funding/funding-instruments-programming/nipspins_en (last visited24.04.2017).
- EC - European Commission (2017b):Development Cooperation Instrument (DCI) 2014-2020: Multiannual Indicative Regional Programm for Latin America. https://ec.europa.eu/europeaid/sites/devco/files/dci-multindicativeprogramme-latinamerica-07082014_en.pdf (last visited24.04.2017).
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- ICMM (2014) The role of mining in national economies
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