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Responsible mining? Challenges, perspectives and approaches

Summary of the findings of the research project „Approaches to reducing negative environmental and social impacts in the production of raw materials (UmSoRess)"

For our Environment

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Approaches to reducing negative environmental and social impacts in the production of metal raw materials

by

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AMD	Acid Mine Drainage
ASI	Aluminium Stewardship Initiative
BG	Berlin Guidelines
CFGS	Conflict-Free Gold Standard
cfsi	Conflict-Free Sourcing Initiative
DFA	Dodd-Frank Wall Street Reform and Consumer Protection Act
EIA	Environmental impact assessment
EITI	Extractive Industries Transparency Initiative
EU	European Union
FM	Fairmined
FT	Fairtrade
GARD	Global Acid Rock Drainage
GRI	Global Reporting Initiative
ICMM	International Council on Mining and Metals
IFC	International Finance Corporation
ILO	International Labour Organisation
ILO 169	The Indigenous and Tribal Peoples Convention
IRMA	Initiative for Responsible Mining Assurance
ISEAL	International Social and Environmental Accreditation and Labelling Alliance
ITRI	International Tin Research Institute
iTSCi	ITRI Tin Supply Chain Initiative
LBMA	London Bullion Market Association
MIGA	Multilateral Investment Guarantee Agency of the World Bank Group
MinPol	Agency for International Minerals Policy
NGO	Non-governmental organisations
OECD	Organization for Economic Co-operation and Development
RGG	Responsible Gold Guidance
REE	Rare earth elements
RJC	Responsible Jewellery Council
SEA	Strategic environmental assessment

SfH	Solutions for Hope
UBA	Federal Environment Agency
UmSoRess	Research project "Approaches to reducing negative environmental and social impacts in the production of metal raw materials", commissioned by the Federal Environment Agency
UNDRIP	United Nations Declaration on the Rights of the Indigenous Population
US	United States of America
UN	United Nations
WB	World Bank
WB EHS	World Bank Environmental, Health, and Safety Guidelines
WGC	World Gold Council

1 Introduction

Recent years have seen growing levels of exploitation and production of raw materials in remote, ecologically sensitive or politically unstable regions where environmental and social standards are either lacking or poorly implemented. At the same time, there has also been an increase in the mining of ore with low metal content, which often involves greater use of energy, water and chemicals and has a more severe impact on the environment (cf. Schaffartzik et al. 2016). The main focus of this research project is the environmental impact caused by the exploration, extraction, dressing, smelting and transport of metal raw materials. Environmental aspects cannot, however, be viewed separately from social and economic aspects – especially in developing and newly industrialised countries – as aside from its negative impacts, the raw materials sector also creates major opportunities for social and economic development in the producing countries.

Using these challenges as its starting point, adelphi joined forces with the University of Leoben and MinPol and carried out the UFOPLAN research project FKZ 3712 94 315 "Approaches to reducing negative environmental and social impacts in the production of metal raw materials" (abbreviated as: UmSoRess). The first stage of the project involved analysing and documenting the impacts of raw material production on the environment, society and the economy, using 13 case studies on the metals gold, copper, aluminium, rare earth elements and tin.[1] The goal of the case studies was to gain a better understanding of the connections between the environmental and social impacts of producing different metals in the context of various countries with various problems. Particularly relevant and representative cases (mines, countries) were selected according to a set of criteria in order to cover the broadest and most balanced spectrum possible of potential negative environmental and social impacts as well as a range of governance contexts. This provided a basis for analysing 42 standards and approaches – either existing or under development – which aim to improve the environmental and social conditions in the mining sector. The goal of this analysis was to assess the impact of standards, to pinpoint specific strengths and weaknesses and to identify lessons learned and best practices. These findings were used to develop specific policy recommendations to improve environmental and social standards.

This report summarises the key findings of the research project[2] and comprises three sections:

1. Summary of the case study findings: This section focuses on the major environmental and social impacts, their role in conflicts and the specific links between environmental and social impacts.
2. Summary of the analysis of the standards: This section focuses on the findings of the comparative study with regard to effectiveness, lessons learned and best practices, as well as examining the findings of the analysis of links between the standards and their role in the governance system overall.
3. Summary of the recommendations: This section focuses on the recommendations for German environmental policy, which were developed in four specific action areas. The first two action

[1] The case studies and fact sheets on the standards and approaches analysed can be accessed here: https://www.umweltbundesamt.de/umweltfragen-umsoress

[2] The research findings were published as three reports: Rüttinger, L. and Griestop, L. (2015): Vergleichende Analyse der UmSoRess Länder-Rohstoff-Fallstudien. Commissioned by the Federal Environment Agency, Dessau-Roßlau; Rüttinger, L.; Griestop, L. and Scholl, C. (2016): Umwelt- und Sozialstandards bei der Metallgewinnung: Ergebnisse der Analyse von 42 Standards und Handlungsansätzen. Commissioned by the Federal Environment Agency, Dessau-Roßlau; Rüttinger, L. and Scholl, C. (2016): Handlungsempfehlungen für die deutsche Umweltpolitik zur Verbesserung von Umwelt- und Sozialstandards bei der Metallgewinnung. Commissioned by the Federal Environment Agency, Dessau-Roßlau. All reports available for download at: https://www.umweltbundesamt.de/umweltfragen-umsoress

areas comprise the development and implementation of standards; action areas 3 and 4 are concerned with accompanying measures and political processes, goals and strategies.

2 Findings of the 13 country case studies

Focusing on five metals – gold, copper, aluminium, rare earth elements (REE) and tin –, the research project pinpointed and documented the specific impacts of raw material production on people and the environment in their specific economic-technical, political-institutional and socio-cultural context. To this end, 13 country case studies were carried out.[3] One of the key selection criteria was to cover as broad as possible a range of environmental and social impacts, countries, and political, social and cultural contexts. The importance of these countries for the provision of raw materials to Germany was also a deciding factor. Each case study focussed on one metal and one particular mining region or mine. The subsequent findings of the case study analyses are based on the comparative analysis of the 13 country case studies.

2.1 Environmental impacts

The analyses revealed **major environmental impacts** in all of the cases examined. These were particularly severe in countries with mineral resources located in regions that were either rich in biodiversity or isolated and relatively undeveloped before commencement of mining operations.

The high **water consumption** of the mining sector and the **management of water resources** also played an important role. Conflicts over water use with other sectors and the local population arose – particularly in areas suffering from water shortages – and ecosystems were damaged. Activities at many mines resulted in acid mine drainage (AMD) and the pollution of surrounding river systems and groundwater.

Another way in which mining impacted the environment involved **emissions into the atmosphere**, which were produced in particular by the processing of raw materials and through the use of equipment, deforestation and transportation of these raw materials. Emissions of pollutants and carbon dioxide as well as emissions of fine particles and dusts increased.

Failure to dispose of residues from mines in a sufficiently safe manner and to redevelop mining sites were factors that had particularly far-ranging environmental impacts. AMD, for example, resulted in some cases in the contamination of water resources. Even decades after the closure of mines, **residues and hazardous waste from mining**, can have an impact on the environment and thus poses a major environmental risk. This was particularly a problem in countries with poor governance capacities and monitoring mechanisms, where uncontrolled depositing of residues and hazardous waste from mining caused long-term contamination of ecosystems, thus changing the structure and the composition of species and impairing ecosystem services.

Alongside the primary and direct impacts of mining, **secondary effects** also had a negative impact on people and the environment. The influx of workers led to the growth and/or the creation of **new settlements and infrastructure**. In addition to other economic activities, such as logging and farming, which in some cases had a major impact on the environment, the **increase in noise levels** also caused a decline in animal populations, as a number of species are extremely noise sensitive in their incubation period. These effects were particularly problematic in areas that were rich in biodiversity or undeveloped, such as rainforests and polar regions. The **dams and reservoirs for hydropower plants** required for the energy-intensive production of aluminium led to additional land use and changes to

[3] A list of the 13 country case studies can be found in the appendix (table 1).

river systems. Despite the resettlement of fauna and flora, the disruption of migratory routes and suitable habitats resulted in the loss of animal and plant species.

Even if **recultivation and renaturation measures** were planned, it was very difficult to fully restore former mining areas to their original state, particularly in the case of complex and sensitive ecosystems. If restoration was possible at all, it was a long-term process.

Environmental standards and regulations were often overlooked in the informal, **artisanal and small-scale mining** sector. There was generally no thought given to responsible mine site closure, such as recultivation, renaturation or decontamination of mining residues and hazardous waste. As a result, the informal, small-scale mining examined as part of these case studies had a far-reaching impact on the environment. The widespread use of mercury in small-scale gold mines posed a particular problem. As well as spreading through the air and thus directly harming miners, mercury contaminated river systems and entered the bloodstream of fish, ultimately harming the people who ate these fish – sometimes resulting in serious health problems.

2.2 Social impacts

The extent of the **social impacts of the mining sector** also varied greatly depending on each country's individual historical, economic, social and institutional context.

One of the main social consequences was the **adverse impact on the health of the miners and the local population**: Dangers that directly affected miners included accidents, falling rocks and landslides. Particularly in the informal sector, mining activities were carried out at insecure locations and without taking the necessary safety precautions. Other common health problems faced by miners and the surrounding population included respiratory, skin and eye conditions. As a result of mine sites that had been left and had filled with water over time, or reservoirs that had been built to supply mining activities, tropical areas such as Bangka-Belitung saw an increase in the number of mosquitoes and the spread of malaria.

The environmental consequences of raw material production also often had a direct and far-reaching **impact on the livelihoods** of local populations. This was the case because large sections of the population in developing countries – in particular indigenous populations – depend on agriculture for their subsistence and livelihoods. And these are in turn reliant on functioning ecosystems such as rainforests, bodies of water or wetland areas and their ecosystem services.

The use of large areas of land – both directly and indirectly for example through the development of infrastructure – resulted in **competition over the use of land** with other sectors, above all the agricultural sector. The loss of land also frequently forced populations to resettle, often resulting in the loss of old traditions, cultures and traditional livelihoods. This can have **long-term economic consequence**s, particularly in the absence of alternative sources of income. The studies also revealed that the **development of remote areas** and **the influx of workers** to the mines often went hand-in-hand with major socio-economic and cultural changes.

2.3 Conflicts

In many cases, the environmental and social impacts outlined in the previous sections triggered conflicts, which varied in terms of their dynamics and level of severity: They ranged from verbal disputes and non-violent protests to violations of human rights, the suppression of freedom of speech, violent escalations and armed conflicts.

In a number of cases, the environmental and social impacts of the mining sector were the **primary drivers of conflict**; in other cases, they **exacerbated already existing conflicts**. In most of the case studies, the drivers of conflict resulted from **interaction between environmental and social im-**

pacts. This is due to the close links between ecosystems, their ecosystem services and the livelihoods of the local population, as well as conflicts over land and water.

Interestingly, all three of the case studies in which **environmental impacts** were the primary driver of conflict concerned industrialised[4] countries. However, none of the conflicts in these three case studies escalated: C**ontrol and supervisory mechanisms** were in place and functioned well. Disputes surrounding the environmental impact of mining were decided in courts. In addition, **civil society organisations** – which monitored the conflicts and had access to adequate financial resources and staff – played an important role in the non-violent management and prevention of conflicts.

The potential for conflict was particularly high in the case of resettlement due to its far-reaching **social impacts**. In Zambia, South Africa, Indonesia and Guinea, **poor working conditions and low wages** also triggered conflict. These case studies dealt with countries with far-reaching governance problems. The level of violence was high, especially in South Africa and in Grasberg, Indonesia.

The studies also revealed that conflicts were further exacerbated when **mining companies worked together with state security institutions**, such as the military or the police. Furthermore, the conflict structure and the conflict history – such as the historical marginalisation of particular populations – played an important role: the broader the conflict structure and the longer the conflict history, the greater the level of violence and its escalation.

Indigenous populations were particularly affected by conflicts. While the general situation has improved over the last few decades, they still faced displacement, resettlement and human rights violations. The loss of land, resettlement and the resulting profound changes to their ways of life, traditions and cultures were particular problems for these populations. Because of the considerable impacts on indigenous populations, these disputes showed a higher conflict potential than other negative consequences of metal production.

Another important driver of conflict were the **unfulfilled expectations of the local population** with regard to development and prosperity. The local population often assumed that mining would create jobs, boost prosperity and bring about economic progress. However, mining companies often recruited workers who were not from the region and mining projects often had a limited direct employment potential. Combined with the problems faced by local administrations when it came to effectively utilising rising revenues (see also the next chapter 2.4), **economic development often failed to meet expectations**. If mining had negative environmental and social impacts in addition to these unfulfilled expectations, the potential for conflict rose even further.

2.4 Governance

All of the countries examined had **laws and regulations** for the mining sector in place. Over the last decade, the majority of the countries analysed have revised these laws and regulations and included extensive environmental regulations. The problems of the sector are not, therefore, due to an absence of laws and regulations, but rather regarding their implementation and enforcement. In some cases, legislation was lacking – as illustrated by the case studies of Indonesia and Malaysia. Problems often arose with regard to **regulating the closure of mines and the necessary post-closure** measures. In many cases, the polluter pays principle was not firmly established or companies evaded responsibility.

A lack of personnel and financial resources was a key challenge in the implementation of laws and regulations, particularly in the case of control and monitoring mechanisms. Authorities in the developing and newly industrialised countries examined were often poorly equipped and did not have the

[4] These case studies examined rare earth elements in Greenland (Kvanefjeld), rare earth elements in the US (Mountain Pass), and copper in the US (Butte). All case studies can be viewed at https://www.umweltbundesamt.de/umweltfragen-umsoress

knowledge or the capacities needed to effectively implement and monitor regulations. This was particularly the case at sub-national level.

Similar problems arose with regard to **state revenues (levies and taxes)** from the mining sector, which central governments transferred back to regional and local authorities. These funds are generally aimed at mitigating the negative impact of mining in the mining regions and at boosting social and economic development. Without specific guidelines and the necessary monitoring mechanisms, however, it was possible for the authorities to use these funds for other purposes or to corrupt ends.

These problems were exacerbated if there was a lack of legislation and inadequate institutional capacities to **fight corruption**. Furthermore, in a number of countries, mining companies provided financial and material support to the authorities to assist them with tasks such as monitoring projects or granting licences – tasks that require the state to act independently in order to uphold the rule of law.[5] It is not clear how it was possible to guarantee the **independence of the authorities** in cases such as these. In addition, the case studies revealed that **long-lasting and close ties between the state and mining companies** facilitated corruption and had a detrimental impact on compliance with laws and standards. When mining companies took over the **responsibilities of the state**, this often created problems.[6] Although the investment of mining companies in local development and municipalities was generally beneficial – when they invested in infrastructure, for example –, it sometimes also resulted in dependencies.

Overall, the case studies showed that **national and international non-governmental organisations (NGOs)** can play **an important role in controlling and monitoring mining operations**. They identified negative environmental and social impacts, promoted transparency, gave the local population a voice and helped to keep grievances in the public eye, even when political interest waned. In some cases, they also called for compliance with national and international standards and regulations.

2.5 Links between environmental and social impacts

The case studies confirm the hypothesis that forms the basis of this research project: namely, that there is a direct link between the environmental and social impacts of raw material production. The conflicts surrounding raw material production show – especially in developing and newly industrialised countries – that the **negative environmental and social impacts often interact and jointly fuel conflicts**. This is due to the fact that the local population often depends directly on natural resources such as land, water and functioning ecosystems and their services for their livelihoods. Environmental impacts which negatively affect resources and ecosystems thus also always have a negative social impact. Competition over the use of resources has a similar effect: production of raw materials can compete with other economic sectors such as agriculture and tourism over the use of land and water, as well as with the local population who make direct use of these resources.

This also means that the **extent of the environmental impacts has a direct bearing on the extent of the social impacts** and that a greater negative environmental impact generally leads to a greater negative social impact. This was illustrated, for example, by bauxite mining and its extensive land use.

Contextual factors create another link between negative environmental and social impacts, and can equally exacerbate or limit these impacts. The studies revealed that both social and environmental impacts were more common in countries with major governance deficits. The capacities and knowledge to effectively enforce environmental and social standards are often lacking in these cases. At the same time, there is a greater risk of corruption. The marginalisation and discrimination of particular population groups is another factor. This can also result in governments or companies making

[5] Interestingly, close ties between mining companies and the state were more common in states which used to be colonies, such as Zambia, Indonesia and South Africa.

[6] In Guinea, for example, a mining company was put in charge of supplying the population with drinking water and electricity. Supplies were cut off after the refinery was closed.

less effort to ensure that their operations do not have a negative impact. If a country or region has a weak civil society, this also has overall negative repercussions, as civil society can play a decisive role in ensuring compliance with national and international standards and in preventing or resolving conflicts.

The case studies thus also confirm the existence of a series **of risk factors** which facilitate negative environmental and social impacts and are therefore **relevant** to improving existing criticality and risk analysis methods and **to the development of policy recommendations**. These include:

1. the **extent of the environmental impact**, particularly if the environmental consequences have a detrimental effect on other sectors and/or the livelihood of the local population;
2. the aforementioned **governance problems**, which are not primarily caused by a lack of legislation, but rather by problems implementing this legislation due to insufficient capacities and corruption, especially at local and provincial level. A well-functioning civil society also plays a decisive role in this regard;
3. active **conflicts**, a long history of conflicts and/or the marginalisation and discrimination of particular population groups. These can considerably increase the potential for conflict and violence;
4. close **cooperation between mining companies and the state** which blurs the lines of state sovereignty – such as mining companies using state security services or assuming responsibility for public services.

3 Findings of the analysis of 42 environmental and social standards

Following an extensive literature review and based on inputs from the project advisory board[7] and external experts, 42 standards and approaches were selected in consultation with the German Federal Environment Agency and the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. These standards and approaches were subsequently analysed.[8] A very broad definition of the term "standard" was used when making this selection in order to cover the entire spectrum of standards and approaches relevant to metal production.[9]

This included both standards that were specifically geared to mining and standards that were not specifically developed for mining, but were nevertheless used in the sector. The project analysed legally binding and mandatory as well as non-mandatory and voluntary national, regional and international standards. In addition, a small number of standards from related areas which offered lessons learned and best practices (the Kimberley Process, for example) were analysed.

3.1 Findings of the individual fact sheet analyses

The standards were analysed using common evaluation criteria in the form of fact sheets.[10] These studies primarily focused on pinpointing which strengths and weaknesses went hand-in-hand and how this influenced dissemination, legitimacy and acceptance, and the implementation and impact of a standard.

3.1.1 Thematic scope

The 42 standards were analysed to ascertain whether they covered the **three dimensions of sustainable development**: environmental, social and economic. Most of the standards examined cover one or more of the three dimensions. However, they focus on very different points within these categories. Whereas the International Council on Mining and Metals (ICMM) or the Aluminium Stewardship Initiative (ASI) are not geared towards a particular topic, directives on environmental impact assessments (EIA) and strategic environmental assessments (SEA) focus on the environment, while also covering social and economic matters. Standards that target transparency and conflict resources were classified as covering the economic dimension. The studies revealed the following about the overall thematic scope of the standards analysed:

- None of the standards analysed only addresses **environmental aspects**: It was not possible to identify a globally recognised and comprehensive environmental standard, which is specifically geared towards the mining sector or large parts of it. Environmental aspects are generally addressed together with social and economic matters as part of wider sustainability standards, and less frequently solely in conjunction with social aspects.
- Standards not specifically geared to mining which deal with environmental aspects generally address biodiversity, emissions, and/or water, energy and land use. In addition to these environmental issues, standards specifically geared to mining which deal with envi-

[7] The project was supported by the cross-project advisory council "environmental issues of raw materials policy", which comprises representatives of federal ministries, environmental, development aid and economic associations, scientific institutes and civil society organisations.

[8] A list of the 42 standards and approaches analysed can be found in the appendix (table 3).

[9] The following definition was used: a standard is a simplified benchmark (rules, guidelines or also specifications of qualities) used to manufacture products and/or to carry out processes (cf. IHK 2016, PONS 2015, ISEAL Alliance 2014, Straube 2007). Approaches are methods or initiatives, which facilitate the implementation of standards. The term "standard" will subsequently be used in this report to refer to all types of standards and approaches.

[10] A table containing the evaluation criteria for the fact sheets can be found in the appendix (table 2).

ronmental aspects also address other mining-related topics, such as handling mining residues, acid mine drainage, reducing the use of mercury or renaturation.

- All of the standards cover the **social** dimension, but with varying focal points and to varying degrees. The topics range from stakeholder involvement and accountability, to health issues and safety at work.
- Important recurring topics in all dimensions include participation and stakeholder involvement, avoiding the financing of conflicts and protecting the indigenous populations.

Over the last few years, there has been an **increase in the number of standards** aimed at preventing the financing of conflicts through the mining and trade of minerals. These standards primarily concern social and economic matters, as they aim to create greater transparency by introducing mineral tracking and certification schemes, in addition to preventing human rights violations.

In the case of the standards analysed as part of this research project, **the economic dimension** is **always linked to the social dimension**. Nearly all of the standards and approaches which concerned transparency and/or conflict minerals also accounted for social aspects. The Extractive Industries Transparency Initiative (EITI), for example, aims to improve stakeholder involvement and participation by making cash flows more transparent. These approaches, however, mostly fail to take into account the environmental dimension.

3.1.2 Geographical scope

The majority of the standards analysed were global in scope. There were, however, important differences: Most of the standards – those geared towards improving corporate social responsibility, for example, such as the Global Reporting Initiative (GRI), United Nations Global Compact or the UN's Guiding Principles on Business and Human Rights – aimed to be globally applicable, but had experienced varying degrees of success in reaching this goal. The Berlin Guidelines, for example, which also aimed to be globally applicable, have failed to have a global impact.

By contrast, the Dodd-Frank Act, Section 1502 (DFA) achieved a global impact by making it mandatory for all companies listed on the US stock exchange to carry out supply chain due diligence. It is likely that the EU's corresponding legislation, which is currently undergoing formal approval (EU legislation on conflict minerals), will also have a global impact, as it aims to apply to all companies importing conflict minerals into the EU.[11]

It was only possible to identify a small number of standards which deal with specific minerals or resources and are applicable on a global scale. These include the Responsible Jewellery Council (RJC), the Conflict-Free Gold Standard (CFGS) developed by the World Gold Council (WGC), the Responsible Gold Guidance (RGG) developed by the London Bullion Market Association (LBMA), the Kimberley Process and the Aluminium Stewardship Initiative (ASI).

3.1.3 Inclusion of stakeholders

Analysis of the standards revealed key **differences regarding the inclusion of stakeholders**:

- A large proportion of the standards analysed were **developed with the participation of a broad range of stakeholders**. It seems that much has been learned from the mistakes of the past, such as the lack of involvement of industry representatives in the development of the Berlin Guidelines.

[11] The regulation and the due diligence it stipulates will be legally binding. According to the current draft, however, it will only apply to importers to the European Union who voluntarily commit to this obligation (Article 1) (EC 2014a).

- There are a number of exceptions concerning **standards in the area of conflict minerals** (e.g. the ITRI Tin Supply Chain Initiative (iTSCi), Solutions for Hope (SfH), RJC, CFGS developed by the WGC and RGG developed by the LBMA). No additional stakeholders beyond their own members were involved in the development of these standards – at least formally.
- Challenges remain with regard to **effectively involving companies** in the case of a number of **standards with very wide-ranging and high requirements and demands**.
- **Broad stakeholder involvement mostly plays a lesser role** in the **implementation than in the development and revision of standards**.

Overall, **involving relevant stakeholders has a key impact on the effectiveness of** standards, particularly in the case of voluntary standards. In countries with a challenging context, failure to involve important and knowledgeable stakeholders can increase the risk of underestimating negative side-effects.

3.1.4 Legal obligation

If **standards are legally binding, they are generally able to have a greater impact or effectiveness**. Under certain preconditions, however, voluntary standards can also have advantages.

Making a standard mandatory often ensures **fast implementation.** It can help create **new momentum** in a broader sense (for example in the case of the DFA), raise the profile of standards in the media and support the creation of new initiatives to improve social and environmental standards. Certain mandatory standards can thus have a **(global) leverage effect**.

Voluntary and non-binding standards can, on the other hand, "pave the way" and create legitimacy for particular issues or problems. However, it is important to ensure that certain actors do not use "softer", voluntary standards to avoid implementation of binding regulation.

Voluntary and mandatory standards are not mutually exclusive. Announcing plans to introduce legally binding government regulations can result in the private sector introducing voluntary standards in order to pre-empt the statutory regulation. Voluntary approaches, such as the standard initiatives in the field of conflict minerals, also often play an important role in enforcing standards in countries with limited governance capacities.

3.1.5 Further best practices and lessons learned

Monitoring and sanctioning mechanisms

Monitoring and penalty mechanisms are **essential to ensuring the effectiveness** of standards. This applies to both legally binding and voluntary standards. Government authorities or institutions are often responsible for monitoring legally binding standards at national level. The effectiveness of monitoring thus depends on the **capacities and resources** of these institutions as well as the broader governance context. In practice, these are often affected by limited personnel and corruption, especially in developing countries.

International, legally binding standards, which are implemented at national level, can be made more effective by **additional monitoring processes at the international level** – for example by implementing the agreements of the International Labour Organization (ILO), as these comprise a more broad-ranging international complaints mechanism.

Effective **sanctioning mechanisms** also increase the incentive to ensure that standards are well implemented. This includes using public rankings and so-called name-and-shame mechanisms or excluding companies from initiatives. **Possible violations against standards must be pursued in a consistent and transparent manner** and the relevant penalty must be imposed if there is proof that a violation has occurred – particularly in the case of voluntary standards. Failure to do so can create the

impression that violations are tolerated and that companies are using standards to paint their own operations in an overly positive light, above all in the case of industry-led initiatives.

External audits (particularly in the case of certification schemes) **were identified as a key weak point**. Auditing processes must be structured in a transparent manner. Furthermore, audits should only be carried out by experienced auditors who are familiar with local conditions. It is also important to ensure that adequate resources and time are available to ensure an effective inspection. All in all, audits should strike a balance between checking the existence of particular processes and procedures on paper and their implementation in practice.

There is often a lack of **sufficient data and studies regarding the impact of standards**. Comprehensive assessments were only available for a small number of the standards analysed. As a result, it was necessary to evaluate their effectiveness on the basis of isolated reports and expert interviews.

Revision and improvement

Depending on its scope and the inclusion of stakeholders, it can take many years to develop a standard. As a result, there is a danger that by the time the standard comes into effect or shortly thereafter, it may no longer be relevant or may not adequately account for new developments. Standards that were developed over a relatively short time period, however, can have weak points that were not identified during the development phase. It is therefore important to **regularly revise and improve** standards to account for ongoing developments and to adapt to changing conditions.

Process orientation

Introducing a standard is often complex and time-consuming, especially if it involves high requirements and the development and implementation of new processes or structures. Process-oriented standards bring companies and other participants gradually closer to meeting higher standards, can **provide more flexibility, allow organisations to learn and lower the obstacles to implementing standards**. It is particularly important to document these processes and design them in a transparent manner.

Best practices examples

Companies and/or states are generally required to report on the implementation of standards. The reports are often made available to the public on the websites of the various standards initiatives. Identifying and documenting best practice examples at regular intervals can **generate learning effects between the participating stakeholders and facilitate implementation**.

3.2 The role of standards in the overall system

Standards are developed by various stakeholders with the aim of alleviating or eliminating specific problems. They are part of a **complex, global governance system**. This means that standards must always be viewed in terms of their primary goal, which in this case is to promote more responsible approaches to raw material production. During the research project, it became clear that merely focussing on individual standards would thus be too restrictive an approach. The project therefore also examined the interplay between the standards, viewing them as part of a global, multi-level governance system. This involved the **creation of a governance map,** which depicted the links between standards (see figure 1). This analysis was an initial step towards an overall governance analysis.

The relevant literature rarely makes explicit reference to or analyses the role of standards in the overall system. Additional research was carried out, yet it was limited to primary sources and links that were explicitly mentioned in these sources. It was therefore not possible to depict more complex ties or to map out links that were not mentioned in the standards and the literature reviewed.

Functional clusters and classification

Looking at the overall system made it possible to divide the standards into five thematic clusters according to their objectives:

1. human rights
2. transparency
3. conflict minerals (preventing conflict financing)
4. environment
5. sustainable development

These clusters are **not entirely distinct and overlap**. There are, for example, close links between human rights, transparency and conflict minerals.

Within the clusters, it was possible to roughly divide the standards into four standard categories depending on the role they played in the overall system:

- **International normative framework or normative global standards**: These standards determine primarily global and general minimum standards and principles. They are generally non-binding, yet mostly constitute international and customary international law and include UN declarations, such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and the Convention on the Protection of Wetlands (Ramsar Convention).
- **Legally binding standards**: These comprise above all national and EU regulations, laws and guidelines, some of which may also have an extra-territorial and global effect, such as the DFA. This also includes agreements that are binding under international law, such as ratified UN conventions which must be transposed into national laws.
- **Implementation guidelines and principles:** These translate global standards or legally binding standards into specific guidelines for companies or particular sectors. This includes the OECD guidelines, the UN guidelines, ICMM and the International Cyanide Management Code.
- **Standard initiatives:** These initiatives and programmes are responsible for the development, revision and/or implementation of standards. They are generally voluntary, mostly geared towards companies, and include certification and reporting schemes. They generally aim to help resolve governance deficits caused by the inadequate implementation of legally binding standards and laws or by a lack of binding standards. For this reason, they are often – but not exclusively – geared towards countries with deficient governance systems.

The role of specific standards in the overall system

Analysis of the links and interactions between the standards examined revealed two categories of standards, which appear to be key to ensuring an effective interplay between standards:

- On the one hand, standards that take on a kind of **lever function,** making it mandatory to meet certain minimum requirements (the DFA, for example). This can generate significant momentum and provide major impetus to the overall system.
- On the other hand, **implementation guidelines and principles are needed** which translate and break down global standards in order to meet their requirements. The more global the standard, the greater the need to find a wide range of different implementation options which are tailored to each context, thus making it possible to overcome obstacles at national and sub-national level. This is particularly the case in countries with deficient or lacking governance structures. A good approach appears to be drawing up a number of different documents, with each version more specific than the last. This could involve, for example, firstly laying

down generally guidelines and subsequently developing more specific principles for implementation. This can then be used as a basis to create standards initiatives, which help implement these standards globally and above all in countries with governance problems.

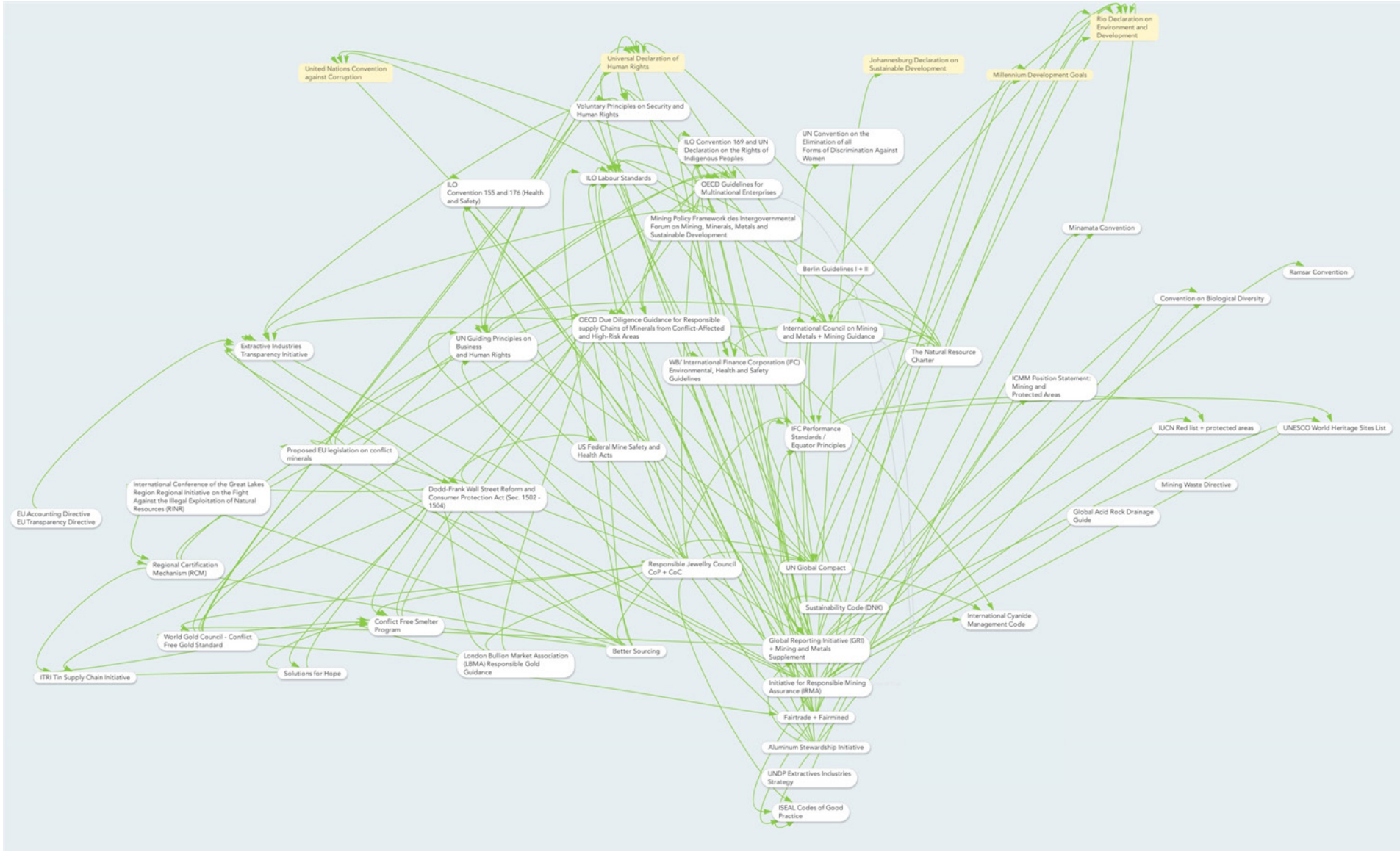
The system analysis revealed that the **environmental cluster does not have thematic weak points so much as functional weak points**. These are caused by a lack of legally binding standards, which could act as levers, and comprehensive, generally accepted implementation guidelines and principles, such as an OECD guideline for environmental standards in the mining sector, or the inclusion of environmental criteria in the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas.

Standards specifically geared to mining, which cover all dimensions of sustainability (such as the Initiative on Responsible Mining Assurance (IRMA), ASI, Fairmined (FM), Fairtrade (FT) and GRI), as well as technical reference documents, such as the World Bank Environmental, Health, and Safety Guidelines (WB EHS) and the Global Acid Rock Drainage Guide (GARD Guide)) could be used as **inputs** when developing such a guideline and provide key **starting points**. They show very clearly where the most **serious shortcomings** exist: when they use national standards, for example, because international standards are formulated too imprecisely or there are none available.

A look at the overall system shows another important point which must be taken into account when developing and implementing standards: **Preventing unintended, negative effects,** in particular when a standard has a narrow thematic focus. Standards in the area of conflict minerals, for example, could result in a move away from small-scale mining and production in developing countries, which would have a considerable impact on the livelihoods of the local population (Manhart et al. 2014). In the past, certification systems have already had a similar impact on the forestry sector.

The large and increasing number of standards and standard initiatives concerning conflict minerals also highlights the need for **efficient coordination of the various standards** in each area. There are particularly close links and mutual recognition between the standards concerning gold mining and conflict financing – at least in theory. **However, it was not possible to find any studies documenting whether this mutual recognition worked in practice or whether there was sufficient use of synergies between standards.** More research must be conducted in this area. Furthermore, these standards contain various requirements regarding implementation. If there is mutual recognition between standards, they should ideally have similar requirements – or at the very least a similar level of requirement – in order to ensure that lower standards do not become the norm.

Figure 1: Governance map – links between selected standards



Source: adelphi

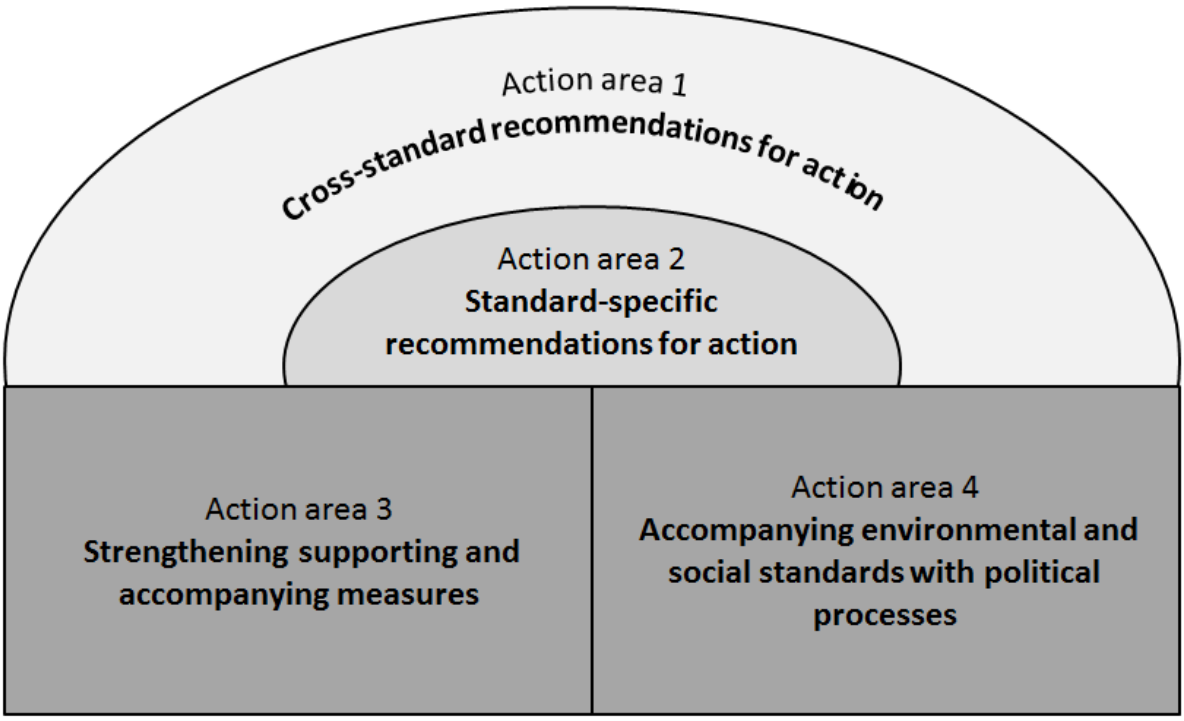
4 Action areas and recommendations for German environmental policy

Due to the broad thematic focus of the project and the various levels on which action could be taken, the recommendations were geared specifically to what could be done by Germany in the field of environmental policy at national, European and international level to improve environmental and social standards in the mining sector. This also meant focusing **on the production of metal raw materials outside of Germany**, since Germany carries a particular responsibility as a major consumer of metal raw materials and the mining sector is facing particular challenges concerning the implementation of environmental and social standards.

This interdisciplinary and international issue touches various policy fields and involves a broad range of stakeholders. A number of the **recommendations thus go beyond the field of national environmental policy** and also cross over into foreign, development, trade and economic policy. In light of this, the recommendations presented also aim to contribute to a raw materials policy that is interministerial, coherent and targeted. This broad approach reflects the multi-dimensional nature of the challenge, which requires answers at different levels (local, national, regional and global).

The recommendations comprise four action areas. The first two action areas focus on the development and implementation of standards, while action areas 3 and 4 are concerned with accompanying measures and political processes, goals and strategies (see figure 2).

Figure 2: The four action areas



Source: adelphi

4.1 Action area 1: Cross-standard recommendations to improve environmental and social standards

The weaknesses of existing environmental and social standards lie mainly in their implementation. This applies to both voluntary and legally binding standards. The wide-ranging challenges in raw material production and a number of considerable differences between the various raw materials meant that it was not possible to find a simple, universal solution – in the form of one specific standard, for example. Furthermore, most of the standards analysed have not been in place long enough to allow for a conclusive assessment as to whether they are effective or not. Despite these limitations, it was possible to **identify a range of starting points from which to begin improving the implementation and design of both existing and new standards**. Instead of targeting particular standards, the following recommendations are formulated in general terms and generally applicable.

4.1.1 Drawing on lessons learned and best practices when monitoring, implementing and developing standards

It is important to actively draw on the identified lessons learned and best practices to improve existing standards and implement them more effectively. These lessons and practices are relevant for both voluntary and legally binding standards, and are key to critically evaluating existing standards and developing new ones. The following points can act as a kind of **check list to assess or improve the effectiveness of standards**:

- inclusion of all interest groups
- well-functioning and effective monitoring and sanctioning mechanisms
- effective monitoring and evaluation
- periodic revision and improvement
- process-oriented standards
- easily comprehensible
- documentation and provision of best practices and implementation examples

There is a need for further research to assess other standards, to conduct more in-depth analysis of the implementation and impact of standards, and to identify and study examples of best practices and pioneering companies.

4.1.2 Improving compatibility between standards – coordinating standard initiatives more effectively and designing them in a complementary manner

The fast-rising number of standards and standard initiatives is a key challenge. The following approaches can be used as starting points to help better coordinate standards:

- promoting compatibility between standards: this includes both vertical compatibility (standards along the supply chain build upon and recognise each other) and horizontal compatibility (different standard initiatives which cover the same parts of the supply chain, recognise and complement each other).
- ensuring compatibility of audits and impact assessments by standardising processes;
- initiating overarching, uniform quality standards for standard initiatives in intergovernmental standardisation bodies.

Other recommendations include analysing the effectiveness of approaches such as ISEAL (International Social and Environmental Accreditation and Labelling Alliance) in order to reduce the fragmentation and improve the compatibility of standards, and examining the option of integrating environmental standards into existing standards and initiatives.

4.1.3 Establishing a better balance between voluntary and binding approaches – working towards legally binding environmental and social standards in the production of metal raw materials

German environmental policy should play an active role in helping create more legally binding environmental and social standards. This is currently relevant, for example, in the case of the EU legislation on conflict minerals: it is still going through the European legislative process and a decision has yet to be reached on whether it will be legally binding. The long-term aim should be to focus on creating legally binding global standards. This research project was not able to provide a conclusive answer on precisely what shape such standards should take. It will be important to also examine whether there are entry points in international law to work towards more binding global standards.

4.2 Action area 2: Standard-specific recommendations to improve environmental and social standards

In addition to the general, cross-standard recommendations outlined in the previous section, the project developed a number of recommendations for specific standards and categories of standards. Wherever possible, the following section refers to specific standards or categories of standards (see chapter 3.2) and outlines general goals and specific entry points to support or improve these standards or categories of standards.

4.2.1 Supporting broad standard initiatives that are geared to sustainability

This research project advocates supporting broad standard initiatives that are geared towards sustainability as a whole and do not focus on just one dimension of sustainability. These standards comprehensively tackle the challenges and risks posed by the production of raw materials and are able to account for the interplay between environmental and social impacts. In addition to economic issues, they also address the environment and social aspects, setting them apart from other standards. Other distinctive features include the fact that they are voluntary and go beyond legally binding standards, such as national laws. They are generally aimed at companies. The following entry points exist for German environmental policy to support such initiatives:

- identifying initiatives to support (together with affected stakeholders)
- promoting the inclusion of a broad range of stakeholders beyond the business sector – in particular from within civil society and governments. Standard initiatives that are geared towards sustainability are often launched by companies or business associations and it is therefore essential to involve a broad range of stakeholders from outside the private sector to ensure that the initiatives are successful and effective.
- supporting the development of permanent, institutional structures and expansion (in terms of membership)

4.2.2 Expanding globally effective implementation principles and guidelines to account for environmental aspects and risks – strengthening the environmental aspects of the OECD Guidelines for Multinational Enterprises and accounting for environmental risks in due diligence approaches

One weak point in the existing governance system which was identified by the project concerns the lack of comprehensive and generally accepted implementation principles and guidelines for mining in the area of the environment (cf. 3.2). Steps should be taken to close this gap. There is also a need to widen the narrow focus of many standard initiatives on conflict minerals: In addition to the avoidance

of financing violent actors, they must also include other conflict risks[12] and make additional efforts to maximise positive environmental and social impacts. Measures here could include accounting for environmental risks in due diligence approaches[13] that are already in place in this area, or transferring these approaches. Specific starting points include:

- developing an OECD guideline to ensure environmental standards in the mining sector and/or due diligence for responsible supply chains with regard to environmental standards in the mining sector;
- revising the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas;
- launching a project as part of the Proactive Agenda of the OECD Guidelines for Multinational Enterprises;
- making the inclusion of environmental risks in due diligence approaches a key topic in the National Action Plan for implementing the UN Guiding Principles on Business and Human Rights;
- investigating the possibility of creating a focal point to report, document and pursue possible violations of environmental and social standards in the mining sector.

4.2.3 Forging closer links between environmental and social standards when developing and implementing standards at German and European level

German environmental policy can play an active role in implementing certain voluntary and binding standards which are being introduced by Germany or in Europe. A key goal of German environmental policy should be to actively link environmental and social standards. Examples include:

- D-EITI (Extractive Industries Transparency Initiative in Germany):
  - address links between governance and corruption and negative environmental and social impacts;
  - possibility of including environmental topics in reporting.
- National Action Plan for "Business and Human Rights":
  - highlight links between human rights, the livelihoods of local populations and the negative environmental and social impact of mining;
  - actively link due diligence with human rights and environmental risks;
  - strengthen environmental and social standards in foreign trade promotion.
- EU legislation on conflict minerals:
  - widen the narrow focus beyond conflict resources, above all to include other minerals, environmental risks and other conflict risks of mining activities;
  - expand and elaborate supporting measures aimed at improving environmental and social standards and resource governance in countries of origin.

[12] This comprises the conflict risks that were detailed in 2.3.

[13] In the context of financing violent actors through mining and trading in raw materials, due diligence approaches involve long-term, proactive and reactive measures which allow companies to ensure that their operations respect human rights and do not fuel conflicts (cf. OECD 2011). One example of this approach is the OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD 2011).

4.2.4 Critically monitoring foreign trade promotion and German and multilateral financial institutions in the field of development cooperation as they implement their standards – calling for and critically monitoring the implementation of existing environmental and social standards

The standards of German and multilateral financial institutions, such as the World Bank and the International Finance Corporation (IFC), are a key starting point in this action area. German representatives are already actively promoting environmental and social standards in these organisations. However, problems and obstacles when implementing these standards remain. At the same time, the World Bank Group's standards have a global influence and wide-ranging application[14] (also in the private sector), making them a central leverage point in the global governance system. At German level, guarantees for untied loans, export credit guarantees (Hermes cover) and the Exploration Support Programme in the field of raw materials are all of particular importance. Specific starting points include:

- making consistent calls for the application of the OECD's Common Approaches and the World Bank's Safeguard Policies, e.g. via the board of directors;
- adequate monitoring and evaluation mechanisms;
- National Action Plan for Business and Human Rights;
- studying and assessing the application of environmental and social standards in German foreign trade promotion and development cooperation financing.

4.3 Action area 3: Strengthening supporting and accompanying measures

The following action area describes a series of key supporting and accompanying measures, which could decisively increase the effectiveness of social and environmental standards in mining. These measures mainly target contextual factors, which have been identified as being key to the effective implementation of standards.

4.3.1 Public purchasers increasing demand for products which contain metals or minerals from responsible mining

Since the revision of German procurement law in 2009, it has been possible to incorporate environmental and sustainability criteria into public procurement. By calling for particular environmental and social standards – in the form of certificates, for example – public purchasers could increase demand for products which contain metal or minerals from responsible mining. Specific starting points include:

- the German Sustainable Procurement Competence Centre reviewing the applicability of standard initiatives in public procurement;
- expanding the existing information services;

[14] All projects which are supported by World Bank loans and guarantees are obliged to implement the World Bank Safeguard Policies. The IFC Performance Standards must be implemented by all clients and financial institutions which receive funds from the IFC or the World Bank Group's *Multilateral Investment Guarantee Agency* (MIGA) (see UmSoRess fact sheet: World Bank Environmental and Social Framework and IFC Performance Standards on Environment and Social Sustainability). All projects financed by the IFC, the World Bank and MIGA must comply with the World Bank Group Environmental, Health, and Safety Guidelines (WB EHS). The guidelines also apply to government-subsidised export activities in OECD member states. In the case of other actors – from the business sector, for example – the EHS guidelines can be used as non-binding reference documents (see UmSoRess fact sheet: World Bank Group Environmental, Health, and Safety Guidelines (WB EHS)). The Equator Principles, which are geared to state and private credit institutions, are based on the IFC Standards and the WB EHS and thus indirectly increase their impact.

- using the product areas of information and communication technologies as a pilot area for sustainable procurement.

4.3.2 Providing better information and increasing visibility – improving the information available on existing standards and the links between them

It is becoming increasingly difficult to gain an overview of all of the standards and the links between them – both for political decision makers, for those implementing standards and for those affected by them. Possible measures involve making information available and organising activities which aim to boost the visibility of the standards. Many stakeholders fear that the large numbers of standards – and in particular certification systems – is creating uncertainty among consumers. However, this is not a problem that is exclusive to the area of minerals and metals. It is possible to learn from other areas and connect with initiatives from other sectors. Starting points include:

- developing a general information portal on existing standards and the links between them;
- providing implementing actors with detailed information products to help them meet high environmental and social standards in their own supply chains and comply with corporate due diligence;
- increasing the visibility of standards.

4.3.3 Supporting and strengthening the role of civil society in the development, design and implementation of standards in Germany, Europe and abroad

Pressure from the public and civil society is key to improving environmental and social standards. Civil society – in particular in the form of NGOs – plays an important role here: on the one hand, in the process of developing and designing new standards; on the other, with regard to legally binding standards and their implementation, insofar as NGOs often taken on important monitoring functions and highlight shortcomings. Many NGOs are also pioneers when it comes to implementing accompanying measures for standards. At the same time, NGO staff frequently fall victim to human rights violations and thus require particular protection. Starting points include:

- examining the extent to which German environmental policy can strengthen and support civil society actors in the area of mining
- engaging the strong civil society organisations in Latin America as dialogue partners.

4.3.4 Increasing implementation capacities in countries of origin through capacity building and promoting accompanying measures

The social and environmental impacts of mining are often closely linked to a country's governance capacities. Many countries face difficulties complying with legally binding minimum standards or effectively implementing them because state institutions have insufficient capacities or are facing corruption challenges. Starting points include:

- expanding bilateral and multi-lateral development cooperation portfolios in this area
- using adaptation projects within the framework of the International Climate Initiative to improve environmental and social standards in mining;
- more clearly defining and strengthening the EU Self-Certification Regulation's accompanying measures (above all outside Europe);
- supporting initiatives of other donors – e.g. Dutch Public Private Partnerships – aimed at implementing the planned EU legislation on conflict minerals.

4.4 Action area 4: Accompanying environmental and social standards with political processes

In addition to improving the design and implementation of standards and supporting them with accompanying measures, German environmental policy can also accompany environmental and social standards with political processes, strategies and targets. The dialogue between the private sector, civil society and state institutions on environmental and social standards in mining – which has intensified over the last few years and which was also pursued by the advisory council accompanying the project – is a positive development and a suitable basis for further action. As the entire area is still in its early stages of development, institutions and processes that enable dialogue are particularly important. These processes above all help build understanding and trust between the stakeholders. All too often, distrust and uncertainty create misunderstandings and obstacles, particularly between the private sector and civil society. The following action area specifies a number of political, institutional and process-oriented recommendations which can help improve environmental and social standards.

4.4.1 Making the improvement of environmental and social standards a central policy goal

In order to make the improvement of environmental and social standards in mining an integral and central goal for German policy makers, it is necessary to establish a cross-departmental position and communicate this position to all German and international actors. Starting points include:

- revising the German government's Raw Materials Strategy in a transparent and inclusive process based on an assessment of the implementation of the Raw Materials Strategy thus far;
- elaborating the approaches of ProgRess II and more closely linking the topics of resource efficiency and raw materials production;
- making responsible production of raw materials and supply chain responsibility an integral part of the German sustainability strategy;
- developing indicators to measure the environmental and social impacts of Germany's resource consumption on in resource-extracting and processing countries.

4.4.2 Creating a German, multi-stakeholder forum on environmental and social standards in mining and responsible supply chains

Based on the very positive experiences of the advisory council on "environmental issues of raw materials policy" – which supported this research project and brought together civil society, businesses and the relevant authorities and ministries – and the German EITI multi-stakeholder group, a permanent multi-stakeholder group could be created at national level in Germany on the topic of environmental and social standards in mining and responsibility in supply chains. It should bring together all important stakeholders (the private sector, civil society and the government) to establish priorities, develop a German action plan and share lessons learned. Starting points include:

- ProgRess participation processes;
- advisory council and EITI multi-stakeholder group;
- a European initiative to complement these activities.

4.4.3 International political processes – increasing awareness of and operationalising Germany's global responsibility as a raw materials importer

German environmental policy is already very active at international level, particularly with regard to resource efficiency. Building on this foundation, German environmental policy should actively work towards making environmental and social standards in mining a more central German priority in various relevant international processes. Thematically, these efforts could focus on the aforementioned action areas:

- actively linking environmental and social standards;
- implementing standards more effectively;
- improving the global normative framework.

Starting points could be the G7, G20 or OECD and intergovernmental forums, such as the Intergovernmental Forum on Mining, Minerals, and Sustainable Development, as well as the implementation of the Sustainable Development Goals (SDGs).

4.4.4 Addressing environmental and social standards in bilateral dialogue with selected partner countries and regional organisations

Germany should make more active use of its bilateral relations to selected partner countries and regional organisations to promote the issue of environmental and social standards in mining. Starting points could be the German raw materials partnerships, the African Mining Vision, the Latin American Dialogue Group on Mining, Democracy and Sustainable Development or the EU Raw Materials Initiative.

5 Bibliography

Internationale Handelskammer Koblenz [IHK] (2016): Definition Normen – Standards. http://www.ihk-koblenz.de/innovation/innovation_technologie/Normung_und_Normen/Definition_Normen_-_Standards. Accessed on 01.03.2016.

ISEAL Alliance (2014): Setting Social and Environmental Standards: ISEAL Code of Good Practice. Version 6.0 – December 2014. http://www.isealalliance.org/sites/default/files/ISEAL%20Standard%20Setting%20Code%20v6%20Dec%202014.pdf, accessed on 04.02.2016.

Manhart et al. (2014): Ungewollte Verschiebungseffekte durch Standards und Zertifizierungen – Relevanz und Lösungsansätze für den Bereich der abiotischen Rohstoffe - RohPolRess Kurzanalyse. https://www.umweltbundesamt.de/dokument/ungewollte-verschiebungseffekte-durch-standards. Accessed on 09.11.2015.

OECD (2011), OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, OECD Publishing.

PONS (2015): Grosswörterbuch Deutsch als Fremdsprache. PONS GmbH, Stuttgart.

Rüttinger, Lukas and Laura Griestop (2015): Vergleichende Analyse der UmSoRess Länder-Rohstoff-Fallstudien. Commissioned by the Federal Environment Agency, Dessau-Roßlau. Available for download at: https://www.umweltbundesamt.de/umweltfragen-umsoress

Rüttinger, Lukas; Griestop, Laura and Scholl, Christine (2016): Umwelt- und Sozialstandards bei der Metallgewinnung: Ergebnisse der Analyse von 42 Standards und Handlungsansätzen. Commissioned by the Federal Environment Agency, Dessau-Roßlau. Available for download at: https://www.umweltbundesamt.de/umweltfragen-umsoress

Rüttinger, Lukas and Scholl, Christine (2016): Handlungsempfehlungen für die deutsche Umweltpolitik zur Verbesserung von Umwelt- und Sozialstandards bei der Metallgewinnung. Commissioned by the Federal Environment Agency, Dessau-Roßlau. Available for download at: https://www.umweltbundesamt.de/umweltfragen-umsoress

Straube, Frank [ed.] (2007): Themenfeld: Supply Chain Management - Aktuelle Situation der RFID-Standardisierung. In: Digitale Schriftenreihe Logistik der Technischen Universität Berlin. http://dx.doi.org/10.14279/depositonce-1663.

Schaffaritzik, Anke; Mayer, Andreas; Eisenmenger, Nina and Krausmann, Fridolin (2016): Global patterns of metal extractivism, 1950-2010: Providing the bones for the industrial society's skeleton. Ecological Economics. 122, 101-110, Feb. 1, 2016. http://dx.doi.org/10.1016/j.ecolecon.2015.12.007

6 Appendix

Table 1: Overview of the UmSoRess country case studies

UmSoRess country case studies
Copper
▸ Chuquicamata, Chile ▸ Berkeley, Butte, US ▸ Mopani, Zambia ▸ Grasberg, Indonesia
Gold
▸ Madre de Dios, Peru ▸ Witwatersrand, South Africa
Rare earth elements
▸ Bayan Obo, China ▸ Mountain Pass, US ▸ Mt. Weld, Australia ▸ Kvanefjeld, Greenland
Bauxite-alumina/Aluminium
▸ Pará, Brazil ▸ Sangarédi, Guinea
Tin
▸ Bangka-Belitung, Indonesia

Table 2: Fact sheet evaluation criteria

Summary of the analysis
Summary of the fact sheet
Target
RELEVANCE ► Does the standard target a key problem? ► Does the target reflect current requirements/standard of knowledge/conditions?
Topic
Environment Society Economics
Topical relevance for the mining sector
RELEVANCE ► Specific to the mining sector? ► Which part of the value chain is covered?
Scope
RELEVANCE ► Scope: geographical, focus on raw materials, etc.
Dynamics
EFFECTIVENESS ► The dynamics give insight as to whether a standard has been accepted (is it being adopted by other countries?)
Implementation and efficiency
EFFECTIVENESS Is the standard universally binding? ► Legally binding? EFFECTIVENESS How is the standard implemented, e.g. by passing national legislation? ► Implementation at national level? ► Implementation using specific instruments? ► To what extent are countries and stakeholders included? EFFECTIVENESS Is it possible to say whether the standard has been effective? Where has it had an impact, e.g. more at normative level or in specific and verifiable standards? ► Are the targets realistic? Feasibility? ► Acceptance of the standard ► Has there been evidence of negative effects?

- Monitoring capacities

EFFICIENCY

- Appropriateness of the resources deployed in relation to the results
- How high are the costs; cost-benefit analysis?
- To what extent are the efforts justified, viewed in terms of their impact?

IMPACT

- Did the measures serve as role models, create new structures/have a broad impact?
- What can be said about the overall, identifiable impacts (weighing up positive and negative impacts)?

COHERENT; COMPLEMENTARY; COORDINATED

- Do other policy fields reduce the effectiveness of the standard?
- To what extent is the standard coordinated with other standards? Are there complementary standards?
- Are there synergies or conflicting goals?

Critical discussion: Strengths of the standard

Strengths of the standard

Critical discussion: Weaknesses of the standard

Weaknesses of the standard

Original text

References

Table 3: Overview of all standards analysed in alphabetical order

Standards
Aluminium Stewardship Initiative (ASI)
Berlin Guidelines (BG) I Berlin Guidelines (BG) II for Mining and Sustainable Development, 2002
Better Sourcing Standard
Conflict-Free Sourcing Initiative (cfsi)/ Conflict-Free Smelter Program (CFSP)
Dodd-Frank Wall Street Reform and Consumer Protection Act (DFA)
EC Mining Waste Directive
Environmental impact assessment (EIA) Strategic environmental assessment (SEA)
EU Accounting Directive EU Transparency Directive
EU legislation on conflict minerals
Extractive Industries Transparency Initiative (EITI)
Fairtrade and Fairmined (FT/FM)
German Sustainability Code (DNK)
Global Acid Rock Drainage (GARD) Guide
Global Reporting Initiative (GRI)
Initiative for Responsible Mining Assurance (IRMA)
Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF)
International Council on Mining and Metals (ICMM)
International Council on Mining and Metals: Good Practice Guidance for Mining and Biodiversity (ICMM GPG)
International Cyanide Management Code (ICMC)
ISEAL Codes of Good Practice (ISEAL Codes)
ITRI Tin Supply Chain Initiative (iTSCi)
Kimberley Process
London Bullion Market Association (LBMA): Responsible Gold Guidance (RGG)
Minamata Convention
Natural Resource Charter (NRC)
OECD Guidelines for Multinational Enterprises (OECD guidelines)/ OECD Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas (OECD guidance)
Ramsar Convention
Regional Certification Mechanism (RCM)
Responsible Jewellery Council (RJC)
Solutions for Hope (SfH)
Towards Sustainable Mining (TSM)
Safety and Health in Mines Convention (ILO 176)

Standards
United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) The Indigenous and Tribal Peoples Convention (ILO 169)
United Nations Development Programme (UNDP): Extractive Industries
United Nations Global Compact (UNGC)
United Nations Guiding Principles on Business and Human Rights (UNGP)
Voluntary Principles on Security and Human Rights for companies in the Extractive and Energy Sectors (VP)
World Bank Environmental, Health, and Safety Guidelines (WB EHS)
World Bank Safeguard Policies/ IFC Performance Standards
World Gold Council (WGC): Conflict-Free Gold Standard (CFGS)