Sustainable Development Goal 16 and biodiversity: mainstreaming biodiversity, ecosystem services and human rights in the mining sector
Claudia Ituarte-Lima and Per Stromberg
Highlights

• Mining concessions are often granted without sufficient information about their impact on ecosystem services, thus jeopardizing human rights and biodiversity.

• A framework is proposed for connecting Ecosystems and Well-being Frameworks with Sustainable Development Goal 16 on peace, justice and strong institutions, and the human rights principles, as a support tool to assess the full environmental and human rights impacts of mining, and to support sound policies in mining.

• Notably, these tools help duty bearers and right holders to navigate the difficult balance between short term benefits, and long term and often geographically distant negative impacts.

• Operationalizing human rights principles in mining decision making processes helps to achieve SDG 16 as well as safeguarding biodiversity and healthy ecosystems.
1. Introduction

MINING CONCESSIONS are often granted on insufficient information about negative impacts of mining on biodiversity and ecosystem services. Mainstreaming and the integration of biodiversity across relevant sectors is a key element in the work of the Convention on Biological Diversity Conference of the Parties up to 2020. In a decision in the last CBD-COP 2016, parties committed to mainstream biodiversity into the mining sector in particular. In the thematic report on biodiversity and human rights by the UN Special Rapporteur on human rights and environment, John Knox, highlights that international law recognizes that everyone has human rights to what the Millennium Ecosystem Assessment (MA) ecosystems and well-being (ES) framework describes as the components of human well-being. Knox presented this report at a high level intergovernmental meeting, the UN Human Rights Council which also informed a resolution adopted by consensus by the UN Human Rights Council in 2017 encouraging States to adopt an effective normative framework for the enjoyment of a safe, clean, healthy and sustainable environment, including biodiversity and ecosystems. Thereafter, in 2018 he produced Framework Principles on Human Rights and the Environment. These clear normative frameworks and a political consensus of States is an optimal condition to continue to advance beyond confirmation of norms towards taking concrete actions. Legal and policy support tools, that can help understanding and addressing the mining-environment and human rights nexus, are part of the necessary building blocks in this process.

In this policy report, Section 2 outlines how mining affects biodiversity and ecosystem services, and highlights why understanding these effects is critical yet challenging. Thereafter, in Section 3, Ecosystem and Well-being frameworks from the MA and the Intergovernmental Platform to Biodiversity and Ecosystem Services (IPBES) are applied to mining, as a way to analyze how mining affects biodiversity, and ecosystem goods and services in order to address some of these assessment challenges.

Section 4 proposes the Ecosystems Well-being-Human Rights framework, which we refer to as the EW-HR framework, and provides key conceptual entry points. This framework aims to be a legal policy support tool to weave together Agenda 2030 and Sustainable Development Goal 16 decisions, policy-making and implementation at different jurisdictional scales to protect nature, thereby promoting nature’s contributions to people and a good quality of life. In Section 5, we further elaborate this EW-HR framework by connecting distinct types of human rights obligations (substantive, procedural, and obligations towards people in vulnerable situations) to the ecosystems and well-being dimensions of the framework and apply it to the case of water in mining.

Also as part of this EW-HR framework, Section 6 proposes four necessary (but not sufficient on their own) criteria for granting a mining concession, based on the EW-HR framework, which helps to address the challenges described in the first section. Concluding remarks and recommendations are provided in Section 6.

This policy report is informed by both legal as well as economic perspectives and dialogue with different stakeholders including practitioners from different countries (see Box 1). A dialogue between distinct perspectives and disciplinary insights can provide inputs for a stronger case for achieving sustainable development that safeguards people’s human rights, biodiversity and healthy ecosystems.

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Box 1. Participatory processes and acknowledgements

The policy paper has greatly benefited from participatory processes including feedback received in the Swedish Environmental Protection Agency-UNDP webinars “Environmen
tal governance of the mining sector/ Gobernanza ambiental del sector minero” of the NSBAP Forum Seminar Series & GORI Learning Series (Dec. 2017), as well as presentations including the workshop SEPA-UNDP Mejorando la Gobernanza Ambiental en el Sector Extractivo Colombiano (in Bogotá Colombia Nov. 2017). The authors would like to thank Viveka Mellegård (Albaeco consultant) Rodrigo Martinez Peña (Swedbio/SRC), Vanessa Masterson (Swedbio/SRC), Rodrigo Martinez Peña (Swedbio/SRC) and Marianne Kjellen (UNDP) for valuable inputs provided at a joint side-event co-convened by SEPA-UNDP Environmental Governance Box 1: Participatory processes and acknowledgements Systems of Life include non-use values of biodiversity. Photo: Ituarte-Lima

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1 This finding has been reaffirmed in the workshops during 2016 and 2017 with national policy makers dealing with mining in Colombia, Kenya, Mozambique and Sweden within the SEPA-UNDP Environmental Governance Program

2 CBD, 2014


5 https://drive.google.com/file/d/1zG5OQp1C8c4V1l1xmzFMfF5OdXoorea/ (viewed 20/7/18)

6 See https://www.ipbes.net/policy-support-tools-and-methodologies
2. How mining affects biodiversity, the health of ecosystems, and human well-being

**Biodiversity Underpins** all the contributions of nature to people, for example, nutrient cycling, climate regulation and spiritual values. Impacts of mining and related activities and infrastructure, such as dams, are part of the anthropogenic direct drivers that affect biodiversity and ecosystems. The impacts on biodiversity typically associated with mining vary significantly depending on the type, the scale of mining, the environmental management approach adopted (detailed in an Environmental Management Plan), and the area and type of biodiversity being affected. Different types of mining include open cast, underground, and alluvial mining for example. Each type has very different levels of impact on biodiversity and ecosystems. Additionally, each stage of the mining project can have adverse effects on the environment and on biodiversity. The impact is likely to increase in severity as a mining project develops through reconnaissance, to prospecting, and then mining exploitation. When the mine closes, activities that have negative impacts on biodiversity may draw to an end and the disturbance footprint of the mine needs to be rehabilitated. There may be long-term or latent impacts that continue to impact on biodiversity and ecosystem services after mine closure such as pollution.

Impacts of mining and related activities on biodiversity can be grouped into four broad categories (Table 1). It is illustrative to place each of these categories along a time and a geographical axis (Figure 1). Arguably, policy tends to focus on the first category, (category a) direct impacts, which is also the easiest to analyze. This is also the period when the economic benefits of the mine are the highest for the mining company. Some of the costs imposed on society by mining are also experienced during this period. However, a substantial part of the impacts of mining occur beyond this category, including impacts within the same project site but in the future. Likewise, impacts can also occur within the commercially active period of the mine, but in another location beyond the project site. The three latter categories of impact (b, c, d) are often hidden and hard to demonstrate and prove legally, because they reach beyond the direct mining operation and/or beyond the mining site and mining operation time when the firm is no longer present.

### Table 1.
**Typology of impacts of the mining sector in biodiversity and ecosystems**

<table>
<thead>
<tr>
<th>Types of impacts</th>
<th>Examples of types of impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Impact within the project site, and within the time period that the mine is commercially active</td>
<td>Clearing of land, change in water table levels, water and soil pollution, generation of particulate matter in the air, blasting and sedimentation.</td>
</tr>
<tr>
<td>(b) Impacts beyond the project site</td>
<td>Pollution of agricultural soil or waters, effects on drinking water supplies, or on the productivity of downstream fishing (fish nursery mangroves, river banks, or actual fishing waters).</td>
</tr>
<tr>
<td>(c) Induced impacts (i.e. not directly attributable to the project)</td>
<td>Impacts on associated industries, social services, and commercial services such as stores, and the population growth due to establishment of residential settlements with increased pressure on sanitation, water supply and biodiversity.</td>
</tr>
<tr>
<td>(d) Cumulative impacts (i.e. combined with other activities)</td>
<td>A river may be shared by a mine, a village, and a downstream factory each of which alone does not have a substantial impact on ecosystem services. However when taken together, their impacts breach an environmental threshold, e.g. impacting the same local fishing nursery waters, persistent bio-accumulative toxic substances, further habitat fragmentation, reduction or extinction of particular wild populations.</td>
</tr>
</tbody>
</table>

Source: own elaboration based on discussions in workshops (see Box 1).
Mining activities can have impacts across distinct geographical spaces: from local to regional, national and/or global. Mining can influence the local and regional hydrology by altering ground water and river regimes and thereby affecting fishing grounds and the diversity of fish species. This occurs for example as dams are constructed, or due to excavations that cause seepage into the groundwater, drying up nearby streams or wells. These mining activities may also cut across and thereby connect aquifers. Mining affects the surface water quality through pollution such as acid mine drainage, metal contamination, and increased sediment levels in streams from its processes, and fisheries can be affected by contaminated sediments which may eventually reach human consumers (UNEP 2000). Mining can have an additional impact on ecosystem services through road and/or port infrastructure affecting aquifers and the water needs of mining-induced population growth, which is caused by the influx of migrant workers and by support services to both mining operations and families of mine workers. Alternatively, the cause can be indirect through other land use changes, such as deforestation, to make way for processing infrastructure as well as access roads. Deforestation leads to the loss of nature’s capacity for water buffering and purifying water, as well as to habitat loss, habitat fragmentation and reduction of wild populations. Accidents with wide ranging consequences may occur such as dam breaks, or above-normal release of water from dams e.g. due to heavy precipitation. Such effects on ecosystem services can be of substantial importance for local livelihoods but also regionally or even nationally and internationally. These challenges increase when mining operations occur in geographical settings containing fragile ecosystems, biodiversity and exposed human settlement and in challenging climate zones such as drought prone areas. Quantifying the value of ecosystems in economic terms can, under certain circumstances, be helpful in environmental policy and practice. For example, the Nakivubo wetland in Uganda provides drinking water by bioremediation. The replacement cost of this service can be illustrated by what it would cost to construct and maintain a water treatment plant, which is estimated at US$2 million a year (Almack 2010).

3. Applying Ecosystems and Well-being frameworks to mining

3.1 The IPBES framework: a tool for mainstreaming biodiversity and human rights

A key conceptual and analytical tool for assessing the biodiversity, ecosystem services and mining nexus is the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) framework. It is a simplified model of the complex interactions between the natural world and human societies. The framework includes the following key components for understanding the conditions for conservation and sustainable use of biodiversity, long-term human well-being and sustainable development; nature, the benefits that people derive from nature and a good quality of life. In contrast to the focus of most previous initiatives, the IPBES Conceptual Framework also highlights the central role that institutions, governance and decision-making play in the links among these elements and aims to include a wide set of viewpoints and stakeholders in order to understand the diversity of people and nature relationships (Diaz et al. 2015, 2018). Hence, this framework is especially suited to help specify the content of human rights considering key social-ecological dynamics in the context of mining (see Figure 3).
The contributions of nature to people represent all the contributions of living nature including diversity of organisms, ecosystems, and their associated ecological and evolutionary processes to people's quality of life. IPBES Framework uses the terminology “contributions of nature to people” (Diaz et al. 2018) as an overarching concept that includes the scientific informed terminology “ecosystems goods and services” (MA 2005, TEEB, see figure 3) as well as concepts from other knowledge systems for which the IPBES framework uses the term “nature’s gifts to people”.

The IPBES conceptual framework helps to assess the impact and trade-offs that different economic activities have on human welfare, by mapping the effects of the mining on the contributions of nature to people (ecosystem services), through different localities, and, through time. This framework’s visual tools provide a shared language and a common set of definitions and relationships to make complex systems as simple, pedagogical and relatively easily understood for the intended purpose (Diaz et al. 2018). As an integrative conceptual framework, it is useful in this report for facilitating multi-actor analysis and dialogue between right-holders and duty bearers such as governments in distinct sectors, the mining industry and institutions financing mining and related infrastructure such as dams for water provision. By clarifying and focusing the analysis on social-ecological relationships, this conceptual tool supports communication across disciplines and knowledge systems and between knowledge and policy.

3.2 Detailing the nexus: mining, nature’s benefits to people, good quality of life and human rights

The IPBES framework builds on previous conceptual frameworks, most notably the Millennium Ecosystem Assessment (MA 2005) and serves to understand the interconnections between ecosystem services and the constituents of human well-being, as they are affected by social-ecological changes. Nature's contributions to people include all the benefits that humanity obtains from nature (Diaz 2015). Humanity as a whole and individuals, communities, societies living in rural and urban settings in diverse countries all depend on biodiversity and ecosystems. The IPBES framework refers to ecosystem goods and services — including provisioning, regulating and cultural services; but analogous categories in other knowledge systems include the category of nature’s gifts.

Here we use the different types of ecosystem services and constituents of well-being used in the MA to specify the “Contributions of nature to people” and “Good quality of life” included in the IPBES assessment.7

7 It is worth noting that Diaz et al. 2018 argue that culture is a cross-cutting dimension of all contributions of people to nature (ecosystems goods and services) and present a complementary categorization of these contributions: material contributions, nonmaterial contributions and regulating contributions.
3.3 Indirect and direct drivers of environmental change and thus impacts on human well-being

Above we proposed the ES framework with direct linkages to human rights. Figure 5 extends the analysis by adding drivers of change, and importantly, the effects across different localities and over time. Indirect drivers include governance, legal and institutional frameworks as well as economic factors. The impacts of mining activities can also have distinct time horizons from before the mining concession has been granted, during the mining activities until closure and after closure. Long-term effects are common, and may include depletion of ground water, with potentially strong implications for human rights in a context of climate change. Even before the mining concession has been granted, changes in the social-ecological systems may emerge as a result of people changing their perceptions of the value of land and natural resources in the midst of anticipated changes in ecosystem services. Expected changes in ecosystem services may have an impact – for example in the investments in land and agricultural infrastructure, such as the decision to invest or not in technical irrigation systems for agricultural land that may be affected by mining. Conflicts between community members and/or between communities about the anticipated changes that mining may have in biodiversity and ecosystem services can emerge before the actual impacts of the mining activity have taken place as well as during and after the closure of the mine.

The importance for society of addressing future supply and demand for water-related ecosystem services in a mining context is highlighted by the fact that the mining industry itself is highly concerned with securing access to future water sources in a context of anticipated increased competition for this resource, due to population growth, increased need for water for agriculture, and in a context of climate change (Deloitte 2018). Therefore, the prevention of irreversible damage and the protection of the interests of future generations should be factored in. UN Committee on Economic, Social and Cultural Rights (CESCR) General Comment 15 mentions that “States parties should adopt comprehensive and integrated strategies and programs to ensure that there is sufficient and safe water for present and future generations” for inter alia reducing depletion of water resources through unsustainable extraction and reducing and eliminating contamination of watersheds.

4. The EW-HR framework and its application to mining: Weaving together SDG 16 with the HR principles and EW frameworks

Figure 5.
Drivers of change, and effects across time and space.
Source: MA (2005) adapted by authors

Global
Regional
Local

Long term

Short term

Human well-being
Security
Basic material for good life
Health
Good social relations
Freedom of choice and action

Indirect drivers of change
Demographic factors
Economic factors (globalization, trade, market & policy framework)
Social and political factors (governance, institutional & legal framework)
Science and technology factors
Values, culture and religion

Ecosystem services
Provisioning (food, water)
Regulating (disease control)
Cultural (spiritual, aesthetic)
Supporting (pools/stocks, self formation)
Life on Earth: Biodiversity

Direct drivers of change
Mining affecting local land use, land cover/water
Species introduction or removals
Technology adaptation and use
External inputs (e.g. fertilizer use, pest control, irrigation)
Harvest

4.1 Conceptual entry points for weaving together SDG 16 with the HR principles and EW frameworks

In this section, we provide key conceptual entry points, which together we refer to as the EW-HR (Ecosystems Well-being-Human Rights) framework. This framework aims to be a legal/policy support tool to weave Agenda 2030 and Sustainable Development Goal 16 focusing on connecting the human rights principles with ecosystems and well-being frameworks. Agenda 2030 explicitly states that “the SDGs aim to realize the human rights of all” and that human rights are integrated and indivisible. SDG 16 is to “Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.”

The human right principle of indivisibility recognizes that human rights are all inherent to the dignity of every human person and consequently all have equal status. The human rights principle of inter-relatedness and interdependence recognizes that the realization of one right such as the right to health under certain circumstances depends in wholly or in part, upon the realization of other rights. The interconnections between basic material for life and health are a concern of human rights bodies. For instance, the UN Committee on Economic, Social and Cultural Rights has connected the right to water to other rights through interpreting the right to an adequate standard of living (Article 11) and the right to health (Article 12) of the International Covenant on Economic Social and Cultural Rights.

In the table 2 below, we provide a first entry point which is to connect distinct ecosystem services with interdependent human rights recognized in national constitutions, which in many countries is the legal instrument which is highest in the legal hierarchy. This entry point is also helpful for making a strong case for inter-sectorial coordination, which is key for mainstreaming biodiversity and human rights in the mining sector. Rather than working in silos, inter-sectorial coordination between Ministries of Environment, Health as well as Mining, Planning and Financing, and Environmental Protection Agencies is key for mainstreaming. Furthermore, understanding the connections between distinct ecosystem services and human rights can provide important information that can also serve coordination between these Ministries and National Human Rights Commissions, local governments, parliaments and judiciaries. Concrete information about the connections of ecosystems, well-being and human rights in the context of mining is important for decision making. This includes specifying the content of duty bearers’ obligations to...
Table 2
The ecosystems and well-being framework can be a tool for operationalizing human rights recognized in national legislation (example from the Kenyan Constitution).

<table>
<thead>
<tr>
<th>Examples of ecosystem services</th>
<th>Kenya Constitution: Every person has the right:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease regulation, water quality and quality</td>
<td>“to the highest attainable standard of health”</td>
</tr>
<tr>
<td>Wood, flood protection, water quality</td>
<td>“to accessible and adequate housing, and to reasonable standards of sanitation”</td>
</tr>
<tr>
<td>Food, soil formation</td>
<td>“to be free from hunger, and to have adequate food of acceptable quality”</td>
</tr>
<tr>
<td>Water quantity and quality</td>
<td>“to clean and safe water in adequate quantities”</td>
</tr>
<tr>
<td>Inter-temporal effects</td>
<td>“a clean and healthy environment, which includes the right: (a) to have the environment protected for the benefit of present and future generations.”</td>
</tr>
</tbody>
</table>

These legal and policy support tools would help implement policy instruments such as the CBD Akwé: Kon voluntary guidelines for the conduct of cultural, environmental and social impact assessment regarding developments proposed to take place on, or which are likely to impact on, sacred sites and on lands and waters traditionally occupied or used by indigenous and local communities. The CBD guidelines suggest developing baselines “in consultation with the affected indigenous and local communities, to ascertain those components of biological diversity of particular significance to the affected indigenous or local community”; “(d) Identification of areas of particular economic significance (as hunting areas and trapping sites, fishing grounds, gathering areas, grazing lands, timber harvesting sites and other harvesting areas); …” Identification of sites of religious, spiritual, ceremonial and sacred significance (such as sacred groves and totemic sites). These guidelines also highlight the importance of assessing effects on social cohesion of development projects such as in mining:

“The impact assessment process should take into consideration the possible effects that a proposed development might have on the affected community and its people as a whole by ensuring that particular individuals or groups are not unjustly advantaged or disadvantaged to the detriment of the community as a result of the development”.

A third entry point is connecting the Participation and Inclusion Human Rights Principle embedded in SDG 16.7

16.7 Responsive, inclusive, participatory and representative decision-making at all levels” and 16.10 “Public access to information and ecosystem values needs to be enshrined in law and enforced in practice without discrimination. As part of the proposed framework, we understand the right to access information including non-use values (such as potential impacts on a sacred forest with cultural values) and user values of biodiversity such as fish harvest for food as part of the values to be safeguarded.. Instruments such as the CBD guidelines for safeguards in Biodiversity Financing Mechanisms8, specify both intrinsic values of biodiversity and ecosystems as well as the values of biodiversity and ecosystem functions for local livelihoods and resilience. These CBD guidelines state that the “a) The role of biodiversity and ecosystem functions for local livelihoods and resilience, as well as biodiversity’s intrinsic values, should be recognized in the selection, design and implementation of biodiversity financing mechanisms.” International human rights treaties are explicitly mentioned among the international instruments that safeguards in biodiversity financing mechanisms should take into account in guideline (c) of these CBD guidelines.

The fourth point is connecting the Accountability and the Rule of Law Principle embedded in SDG 16.3 “Rule of law at the national and international levels and equal access to justice for all”, 16.5 “Reduction of corruption and bribery in all their forms” and 16.6 “Effective, accountable and transparent institutions at all levels” with the ecosystems and well-being frameworks.

The reason why healthy ecosystems are degraded in the mining sector is often due to the degradation of the rule of law and accountability mechanisms. Hence, the implementation of the human rights principle of rule of law and accountability is at the core of solutions for addressing, in

respect, protect and fulfill human rights and safeguard healthy ecosystems which is recognized in Constitutional law in many countries, such as in the Kenyan Constitution, as shown in Table 2 and is also enshrined in international agreements.

This entry point helps in particular to connect the Indivisibility, Inter-relatedness and interdependence principles with the Ecosystem framework. Cross-sectorial coordination is vital for mainstreaming biodiversity and human rights in the mining sector.

The second entry point is connecting the principle of Equality and non-discrimination embedded in SDG 16.b “Promote and enforce non-discriminatory laws and policies for sustainable development” with the ecosystem approach. The EW-HR framework helps assess what nature provides to people for achieving what an individual and community values as part of a good quality of life. We argue that it is important to highlight both individual and collective dimensions when understanding the contributions of biodiversity and ecosystems to people as part of this framework. Furthermore, assessing whether laws and institutions are promoting and enforcing non-discriminatory, sustainable development in regulating how access to ecosystem services is distributed among distinct groups is important in actions towards achieving SDG16. The proposed framework can help to identify who is affected (in a positive or negative way) by ecosystem alteration caused by mining. For this purpose, it is important to disaggregate the benefits derived by different sections of society, particularly those individuals and collectives in relatively disadvantaged positions or with differentiated individual and collective rights due to, for example, socioeconomic aspects, gender, ethnicity, geography, and type of livelihood (Daw et al. 2011, Iaira-Lima et al. 2014). After assessing which groups are in a relatively disadvantaged position, other tools can be woven in to harness the human rights, ecosystems and well-being connections. For example, legal empowerment methodologies such as community protocols and paralegals can place local communities, including women and elders, on a relatively more equal level playing field, in dialogue, mediation and/or court cases concerning the mining sector. Training community environmental legal advisers to identify and systematize actionable legal evidence can be a means to support and catalyze collective action in legal processes.


8 CBD-COF Decision XI/3 on “Resource mobilization”, including the Annex II with the CBD Voluntary Guidelines on Safeguards in Biodiversity Financing Mechanisms

practice, environmental challenges in mining. Indeed, in many places the challenge is not the degradation but the non-existence of well-functioning accountability mechanisms in the first place. Specifically, the lack of compliance of environmental regulations is often facilitated through strengthening judicial mechanisms and non-judicial complaint mechanisms. As a human rights principle, it can also serve to guide the architecture for environmental impact assessment and environmental management plans in mining. Furthermore, legal provisions that would trigger compulsory human rights assessments connected to environmental impact assessments and monitoring can be part of the synergies between these tools for realizing human rights and healthy ecosystems.

Understanding the connections between ecosystem services and human rights can contribute to making explicit and therefore transparent the tradeoffs across different locations and time and how different groups of people are affected. Analysis and monitoring across time and space is key for sound decision making especially by States who are the main duty bearers of human rights. Such transparency and monitoring are vital for preventing irreversible damage to ecosystems during mining activities.

The UN CESCR General Comment 15th mentions that States parties should adopt comprehensive and integrated strategies and programs to ensure that there is sufficient and safe water for present and future generations for inter alia reducing depletion of water resources through unsustainable extraction and reducing and eliminating contamination of watersheds. Assessments such as Environmental Impact Assessment of mining and monitoring of performance and compliance of the Environmental Management Plan of a mine can lead to transparency. The Environmental Management Plan should include specific responsibilities and timelines for safeguarding biodiversity and ecosystems during mining construction, operation and after closure. Among the relevant questions to address is who does the Environmental Impact Assessment including considering the potential for conflicts of interests.

5. The EW-HR framework: the case of human right to water

IN 2017, the UN Special Rapporteur on Human Rights and the Environment, John Knox11, in his thematic report linking biodiversity and human rights makes the conceptual distinction between a) substantive obligations; b) procedural obligations and c) obligations concerning people in vulnerable situations.12 We use this conceptual distinction to enrich the EW-HR framework and help understand the content of human rights obligations and specific rights relevant to assessing mining activities.

a) Substantive obligations: Using the example of the right to water and impacts of mining

Biodiversity underpins healthy ecosystems. Continued provision of ecosystem services in turn affects substantive human rights such as the right to water and right to health. For example, growing evidence shows that contact with diverse habitats and many distinct species, has important positive impacts for human health, a constituent of well-being.

Among the many distinct connections between ecosystem services and substantive human rights, here we will focus on highlighting the nexus of mining impacts on ecosystem services and the right to water. The mining industry typically has significant impacts on water but is also strongly reliant on water for processing and for hydroelectric plants supporting their high demand for energy. But water also provides vital ecosystem services, as highlighted above in Table 2. Given its importance to many dimensions of human well-being, in 2010, the UN specifically recognized the human right to safe drinking water and sanitation as a separate right. Water is also an important component of e.g. the right to an adequate standard of living. Regional human rights mechanisms such as the African Commission on Human and People’s Rights, the European Court of Human Rights and the Inter-American Court of Human Rights have also contributed to interpreting the content of the water-related obligations, as have various courts under national law.13

But what does the right to water mean? The right to water is a right for personal use. It does not apply to companies or operations like the mining sector. Instead, decision makers must consider the mining sector’s demand for water in light of the rights of individuals and the communities to water. The UN CESCR in its General Comment No. 15 (2002), highlights that as with other human rights, the rights to water include obligations to respect, protect and fulfill human rights14.

• RESPECT human rights, which requires States to refrain from interfering directly or indirectly with the enjoyment of the right to water such as by arbitrarily interfering with customary or traditional arrangements for water allocation or unlawfully diminishing or polluting watersheds and water-related ecosystems through waste from State-owned mining companies.

• PROTECT human rights, which requires States to prevent third parties such as non-state owned (i.e. private) mining companies from interfering with the enjoyment of the right to water.

• FULFIL human rights requires States parties to adopt the necessary measures such as sufficient recognition of this right within the national political and legal systems, preferably by way of legislative implementation; adopting a national water strategy and plan of action to realize this right; ensuring that water is affordable for everyone; and facilitating improved and sustainable access to water, particularly in rural and deprived urban areas.

In order to help governments and others set parameters around the right to water, the UN CESCR also sets out the different aspects of the right to water:

• AVAILABILITY – whether there is a sufficient amount of water available within a given geographical area (e.g. a country, a district or a village) and whether there is a regular supply of water over time. It is an objective criterion, which can be measured through quantitative data (e.g. amounts of water and duration of water cuts).

• ACCESSIBILITY – has at least 4 dimensions – (i) physical accessibility means that water must be within physical reach and that it can be accessed without physical threats; (ii) economic accessibility is often referred to as affordability; (iii) information accessibility of information on water; and (iv) non-discrimination which cuts across all dimensions of accessibility.

10 UN CESCR General Comment 15 ‘in Note by the Secretariat, Compilation of General Comments and General Recommendations adopted by Human Rights Treaty Bodies’ [2008] UN Doc. HRI/GEN/1/Rev.9 (UN CESCR ‘General Comment 15’).
11 For biographical details and information on the work of the Special Rapporteur see http://www.ohchr.org/EN/Issues/Water/docs/CESCR_GC_15.pdf
**ACCCEPTABILITY** – refers to consumer acceptability of water in terms of color, odor, taste and cultural acceptability.

**QUALITY** – water must be safe; the state must prevent, control and treat water related diseases; and water facilities and services must be of sufficient quality. This can be defined by reference to water parameters and access to water including remedying the need) (see Annex I). For example, States have specific procedural obligations before granting a mining concession or authorizing a dam which would cause the degradation or loss of biodiversity. These obligations include assessing the environmental and social impacts of the proposal, including through the Environmental and Social Impact Assessment processes, and facilitating that people exercise their rights to freedom of expression and association and public participation in the decision-making processes. Operationalizing the rights to public participation can contribute to better informed decision making on ecosystem services (see subsection d) below). Procedural rights also include the right to access effective legal remedies for those who claim that their rights have been violated.15 Hence, from a human-rights perspective, a key focus is how distinct and interdependent rights are affected by mining and how to manage ecosystem services in a way that secure equality, dignity and well-being for all.

d) **Obligations concerning people in vulnerable situations**

Adverse impacts to ecosystems by mining activities may have disproportionately severe effects on the enjoyment of human rights of members of minorities or indigenous peoples who rely directly on the ecosystems through traditional activities such as fishing. In these cases, States have heightened procedural obligations such as positive legal measures to ensure the effective participation of members of minority communities in the decisions that may adversely affect their relationship with the ecosystems that they depend on, as well as obligations concerning substantive rights such as the protection of the ecosystems themselves. Sometimes, whole groups of people can be in a vulnerable situation such as indigenous peoples or ethnic minorities but it can also be sub-populations, such as women and children and the landless. In communities who depend directly on the ecosystems for their livelihoods, women and children are often the ones fetching water. Restrictions in the physical accessibility of clean water can affect the possibilities, particularly of girls, to attend school and hence affect the conditions of a specific group to exercise their rights to education.16

Ecosystem degradation often has its most direct and severe impact on people under poverty conditions in rural settings. Wealthier segments of the population control access to a greater share of ecosystem services and can often purchase alternative access to services, or offset local losses of ecosystem services by shifting production and harvest to other regions. For rural people in poverty situations, who are often the most affected by mining, substitutes for access to biodiversity and ecosystem services and alternative choices are frequently very limited. This has led to many conflicts between competing social groups or individuals over access to and use of biological products and ecosystem services. For these reasons, disaggregating access to ecosystem services by different sections of society and understanding and addressing how they will be affected by mining operations can support the operationalization of the human rights principle of equality and non-discrimination.17

d) Using the EW-HR Framework to understand and act upon the impacts of mining on ecosystem services and impacts on human rights

Table 3 which focuses on rights associated with water is an example of how the EW-HR Framework can also be used to understand and act upon the impacts of mining on ecosystem services and impacts on human rights. The EW-HR Framework can help identify different ecosystem services such as protection against erosion and purification of water, as well as how mining affects distinct human rights of different groups.

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21 Related to how feasible it is to substitute the loss of the ecosystem services.
Key dimension of the EW-HR Framework are the following:
• spatial dynamics / scales (local, regional, global)
• time horizons (short-term, medium-term and long-term)
• factors that indirectly affect ecosystems, such as population, technology, and lifestyle that can lead to changes in factors directly affecting ecosystems, such as the catch of fisherries or the application of fertilizers to increase food production
• The resulting changes in the ecosystem cause the ecosystem services to change thereby affecting human well-being and the full enjoyment of human rights.

Spatial impacts
Mining affects the surface water quality that then has extended spatial impacts throughout river basins and through:
• pollution such as acid mine drainage, metal contamination, etc.
• increased sediment levels and increased contaminated sediments in streams from its processes.20

These challenges increase when mining operations occur in difficult geographical settings and in challenging climate zones, containing fragile ecosystems and exposed human settlement.21

Impacts through time horizons
Decision-makers also need to consider the temporal impacts of mining on water, considering the rights and interests of future generations to such a vital resource.20 In doing so, they must consider factors such as:
• Future supply and demand for water in a mining context
• There are already evident efforts of the mining industry to secure access to future water sources for their mining operations in a context of anticipated increased competition for this resource, especially in a context of climate change. Authorities have the obligation to prevent both State and non-state owned mining companies from interfering in any way with the enjoyment of the right to water in short and long term.

6. The EW-HR framework: necessary (but not sufficient on their own) criteria for mining, guided by Human Rights Principles

ANY COUNTRY NEEDS to carefully assess applications for mining concessions. Here we take as a basis the challenges described under impacts of mining, and how difficult each is to tackle, especially due to their different locations and through time. Four criteria are proposed to help policy makers to avoid common pitfalls. It can be useful to view these criteria in relation to figure 1 describing types of impacts of the mining sector on biodiversity and ecosystems. For instance criterion 1 corresponds to a large degree to the same time period as the impact category ‘a’ on impacts within the project site, and within the time period that the mine is commercially active. Criteria 2 and 3 tend to be substantially influenced by matters beyond the concession's physical boundary and beyond closure, i.e. as do the following impact categories: (b) impacts beyond the project site, (c) induced impact categories and (d) cumulative impacts. Criterion 4 deals with the institutional set-up beyond the project site.

The EW-HR framework described above is used in different ways to provide a more solid decision basis. Human rights principles are applied to each challenge and provide a legal tool to motivate the use of the criteria. Moreover, it shows how weaning the human rights principles in SDG 16 helps to implement international biodiversity law commitments in terms of the CBD.

Assessment criterion 1: Is the mining venture too risky in terms of likely bankruptcy?
Guiding HR principle: Principle of Accountability and the Rule of law

This assessment criteria is a basic business economic criteria. It is worth recognizing that the benefits of a project are often provided by the project proposer. Naturally, the potential benefits need to be scrutinized with the same rigor as the potential negative impacts of the project. Firms and policy planners may make different judgments about the riskiness of projects. This can be due to firms understating the financial cost of future environmental liabilities. For example, firms may commit this wrongdoing either in a planned way, or, become aware of it during the mining process. For different reasons, such revised information may not reach the policy makers who are also the main duty bearers of human rights.

It should also be cautioned that environmental policy may rely on laws that regulate bankruptcy should be dealt with, to ensure against potential environmental liabilities. I.e. in case of bankruptcy, the remaining assets can be used to pay for environmental damages. However, in practice this may not work as intended. The remaining financial assets may be insufficient. Moreover, such claims on a bankruptcy case require abundant resources which may be especially challenging in low-income countries (e.g. sufficient knowledge and time of government staff to engage in the bankruptcy case). In practice this is often missing, with the results that the bankruptcy does not cover the environmental debt.

CBD implications: Often, there are not sufficient funds after a bankruptcy to cover environmental liabilities. Similarly, even if economic securities are deployed, these may not work as intended (e.g. for reasons outlined in criteria 4). Hence, these liabilities are either left unaddressed, meaning a direct effect on the environment. Alternatively, tax money is invested in cleaning up the environmental debt of the mine. Avoided bankruptcy frees up such tax money to invest in other biodiversity conservation and sustainable use activities. Hence, adhering to the Principle of Accountability and the Rule of law assists compliance with CBD through reduced risk of diverting resources to cleaning up the pollution from bankrupted mines and instead investing these resources in projects. For example, supporting local agroforestry systems rich in biodiversity that further the CBD goal of biodiversity conservation and sustainable use and the protection and fulfillment of human rights.

Assessment criterion 2: Are societal benefits of the project larger than societal costs – without accounting for opportunity cost?
Guiding HR principle: Interdependency and Interrelatedness & Principle of Participation and Inclusion

Duty bearers have a margin of discretion for balancing environmental protection and other legitimate societal goals but the balance must be reasonable, and never result in unjustified, foreseeable infringements of human rights (Knox 2017).

To contribute to clarifying whether a reasonable balance has been struck, human rights bodies have identified key factors in the context of environmental harm and included whether the project in question is the result of a process that complied with the corresponding procedural obligations (see more on these types of obligations in Section 3); whether it is non-retrogressive; whether it is non-discriminatory; and whether it is in line with international and domestic standards (see A/HRC/22/53, paras. 33–36). States should also fully implement their laws protecting human rights related to the environment in striking the balance between environmental protection and other legitimate societal goals.

This assessment criterion entails a comparison of societal benefits and costs, without accounting for other potential uses of the resources. Clearly, the revenues from the project need to exceed the host country’s net cost for the project. An example follows below:

**PUBLIC FINANCE IMPACT:**

*Do mining revenues exceed tax expenditures?* Fragmented assessments of mining projects often focus only on the positive impact from royalties and employment. However, mining ventures often come with public finance commitments to upgrade or construct new roads, water and sanitation systems, electricity supply to be used by the mining project. Moreover, tax breaks and other hidden subsidies are common to attract foreign direct investment. This assessment criterion adds the opportunity cost of resources to the comparison of societal costs and benefit criteria. It is not sufficient that the mining venture contributes more than it takes from society (Criterion 2). It also needs to be established that the resources such as the minerals, the ecosystem services, the labor, would not contribute even more to society if used in an alternative way. This is the so-called opportunity cost of resources23, for example, using these resources for agriculture and fishery activities, and to households. Hence this third criterion also needs to account for future use of resources. For example it may be the case that the timing is not right for extracting the minerals. From the point of view of a foreign investor, there may not be time to wait for higher international raw material prices. However, in economizing with a nation’s resources it may in some cases be preferable to wait for higher raw material prices in order to extract a higher economic rent from the mineral resource.

One common way to express the different resources is to distinguish between financial capital, natural capital, physical capital (such as machinery) and social capital. But there are of course other aspects to account for, including those mentioned under cultural ecosystem services. This criterion should also account for changes that occur in the context of the project, such as population growth (and hence increasing demand for ecosystem services), and climate change (which often decrease the supply of ecosystem services including water). This criterion is more demanding to compute. However, as it is the case with the other criteria, projects that may appear to be beneficial may have large hidden costs for society. Specific examples include:

**EMPLOYMENT EFFECTS** are often assessed in a local context only. A mining venture may well give rise to increased labor opportunities, either in the mining operations, or through support services catering to the needs of those workers, or in construction of new roads, among others. However if mineral resources belong to the nation, the benefits from these resources may be seen as a national and not only local issue. Questions that need to be asked when assessing the net labor market impact of the mine are whether those workers came from the locality or from elsewhere? What workers were engaged in before (i.e. labor market leakage effects: where they wage employed and paid tax in another municipality which by implication now faces a negative impact on tax income)? Labor market effects may have difficult implications, for example, if workers are drawn from activities which as a consequence face a labor shortage (e.g. the importance of having local agricultural production may be even higher if there are market constraints, such as poor transport infrastructure, which cause a local undersupply and thus spiking food prices locally). Other concerns are child labor and drawing children from education and into wage labor too early.

**ENVIRONMENTAL EFFECTS:** see the other sections dealing with the environmental impact, and, the EU-HR framework.

**CBD implications:** This reasoning applies to all four criteria: adhering to the HR Principle: Interdependency and Interrelatedness & Principle of Participation and Inclusion.

**Assessment criterion 3:** Does the project mean the most beneficial use of society’s resources?

**Guiding HR principle:** Interdependency and Interrelatedness & Principle of Participation and Inclusion

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**Assessment criterion 4:** Do the revenues from the project reach the nation’s people without discrimination?

**Guiding HR principle:** Accountability and the Rule of Law & Principle of Participation and Inclusion

Assessment criterion 4 concerns institutions for the correct use of benefits and distributional aspects. Even if criteria 3 is fulfilled, and the mining venture provides sufficient net-surplus benefits to the country, there are risks that these benefits are diverted and do not contribute to legitimate societal goals.

A lack of well-functioning institutional frameworks, rule of law and accountability may cause economic resources from mining to be diverted through corruption. Alternatively, corporate strategies to divert taxable revenues to foreign locations are frequent, including transfer pricing practices whereby companies manipulate in-company purchase prices in order to de-facto transfer revenues from one country to another country.

Human rights abuses by businesses often involve environmental harm and mining that can cause especially widespread damage, which is often felt by indigenous peoples and other local communities who depend on the forests, rivers, wildlife and other ecosystems that are degraded or destroyed by the extraction of mineral resources (Knox 2017a). States shall permit and fund only activities that respect and protect human rights, especially the rights of those who are in vulnerable positions for residing most closely to the mining activities, and corporations need to comply with their responsibility to respect those rights.

**CBD implications:** Adhering to Non-discrimination and Equality and the Principle of Accountability and the Rule of law helps towards compliance with CBD through reduced risk of losing resources that could be used to invest in the CBD goal of biodiversity conservation, sustainable use and benefit sharing. The implications explained in Criterion 3 are also applicable to Criterion 4.
7. Concluding remarks and recommendations

Mainstreaming biodiversity in the mining sector is necessary for safeguarding the contributions of nature to people that support the full enjoyment of a wide range of human rights, including the rights to life, water, health, and an adequate standard of living. Here tools for guiding policy makers are proposed, enabling them to trace the links between mining, environment, human well-being, and human rights. In order to protect human rights, States have a general obligation to biodiversity and ecosystems. In turn, enabling conditions to exercise rights in the mining sector such as right to information and local participation in environmental impact assessments in mining, access to information e.g. baseline data concerning the status of biodiversity and ecosystems before a mining concession is granted, and access to justice in environmental matters can contribute to safeguarding life supporting systems.

Below we mention key areas where the Ecosystem and Human Well-being – Human Rights (EW-HR) Framework aims to contribute. They are followed by recommendations for different groups. It is worth noting that some recommendations to one group may also be relevant to other groups.

The operationalization of human rights principles in mining decision making simultaneously helps to achieve SDG 16, and safeguard biodiversity and healthy ecosystems.

**States**, the main duty bearers of human rights, can use the policy support tool proposed in this policy paper, the (EW-HR) Framework, to:
- Assess and clarify key impacts of mining for sound legal and policy making in line with the general human rights obligation to protect biodiversity and ecosystem services and also the full enjoyment of interdependent human rights;
- Highlight the urgent need to protect biodiversity and ecosystem services in the mining sector across space and time;
- Promote legal and policy coherence by mainstreaming cross-cutting dimensions of Agenda 2030, specifically sustainability and human rights principles in the mining sector.

The EW-HR framework contributes to assessing the full picture of the impacts of mining for informed decision making. In contrast to a fragmented analysis (limited to, for example, hectares of trees affected in a mining project site, which may be compensated for elsewhere with planting of other trees), the EW-HR framework helps to assess impacts beyond the extraction site and further ahead in time. In this context, the full picture of the impacts of mining means assessing relevant geographical connections, for example, impacts of mining downstream as opposed to solely in the mining project site. The proposed framework also helps to identify the impacts before a mining concession, during the mining exploitation active time, and after the mine closure – in contrast to only the time that the mining project is commercially active. In line with the HR principle of indivisibility and interrelatedness of human rights, the EW-HR framework helps to assess interrelated human rights obligations such as those associated with the right to clean drinking water and the general obligation to safeguard biodiversity and ecosystems.

Mining constitutes a challenging policy arena, often with prospects of substantial gains for localities (e.g. employment and local development) and nations (e.g. royalty incomes). These benefits tend to be clearer in the short term. In contrast, much of the societal costs imposed by the operations occurs further away: either beyond the actual mining operations (e.g. mine-induced local population growth which causes stress on local water supply); or beyond the mining concession area (e.g. effects on the water table from hydroelectric dams and infrastructure development serving the mine); or far into the future when there is no longer a mining operator to be held accountable. To address these challenges, the report specifies four criteria that should contribute towards sounder mining policies. These basic criteria are necessary (although not sufficient) for any mining project to comply with. If they are considered costly, it should be kept in mind that a project whose benefits do not exceed these costs and risks is not likely to contribute towards sustainable development. For example, effective national institutions need to be in place to channel the benefits from mining to people without discrimination. Legal loopholes and corruption can easily transfer those benefits away from the state and the people.

The mining industry is itself dependent on key ecosystem services such as water provision, which rests on the integrity of biodiversity and ecosystems. It is in the interest of the public and private mining industry to safeguard life support systems on which we all depend. Compliance with human rights and environmental law can help mining companies to contribute towards sustainable development, and avoid court processes costly operational delays or stoppages, licenses being revoked and/or loss of investment.

Civil society organizations are encouraged to use the proposed EW-HR Framework as a means for:
- Contributing to prevent and address the effects of mining on life support systems for a prosperous future for current and future generations. Exercising the right to information, public participation and access to justice, is interdependent and indivisible to the right to a clean and healthy environment.
- Systematizing and sharing good practices for example with groups using legal empowerment methodologies and community protocols and paralegals that place local communities, including women and elders, on a more equal level playing field, in dialogue, mediation and/or court cases concerning the mining sector.

**Mining and related infrastructure industry as well as investors in mining companies** can use the EW-HR framework in ensuring they respect human rights in actions that may affect the contributions of nature to people, including by:
- Complying with the human rights principles specified in this policy report in all actions that may affect biodiversity and ecosystems, including by being transparent and accountable vis-à-vis public authorities and civil society about the full picture of impacts of their operations;
- Following the CBD relevant guidelines (e.g. CBD Voluntary guidelines for safeguards and Akwé: Kon voluntary guidelines) and recommendations of UN Special Rapporteurs relevant to mining (e.g. recommendations of the Special Rapporteur on human rights and environment concerning biodiversity (A/HRC/34/49) and the Special Rapporteur on the rights of indigenous peoples with respect to extractive activities (A/HRC/24/41)) and;
- Avoiding applying for concessions for mineral exploitation and related infrastructure such as dams in protected areas or indigenous and community conserved areas.

Complying with the human rights principles specified in this policy report in all actions that may affect biodiversity and ecosystems, including by being transparent and accountable vis-à-vis public authorities and civil society about the full picture of impacts of their operations;
**References**


Diaz et al. (2013) The IPBES Conceptual Framework — connecting nature and people, Current Opinion in Environmental Sustainability, 14 (1–2)


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Note: The electronic references in the list were last accessed 8 May 2018.
Sustainable Development Goal 16 and biodiversity: mainstreaming biodiversity, ecosystem services and human rights in the mining sector

Claudia Ituarte-Lima and Per Stromberg

Mining concessions are often granted without sufficient information about their impact on ecosystem services, thus jeopardizing human rights and biodiversity. Here tools are proposed based on ecosystem services, human rights and economics, to construct more solid decision support. Specifically, a framework is proposed for connecting Ecosystems and Well-being Frameworks with Sustainable Development Goal 16 on peace, justice and the human rights principles, as a support tool to assess the full environmental and human rights impacts of mining, and to support sound policies in mining. Notably, these tools help to clarify for right holders and duty bearers the difficult balance between short term benefits, and long term and often geographically distant negative impacts. This policy report is informed by both legal and economic perspectives and dialogue with different right holders and duty bearers including practitioners from different countries (see Box 1). A dialogue between distinct perspectives and disciplinary insights can provide inputs for a stronger case for achieving a sustainable development that safeguards people’s human rights, biodiversity and healthy ecosystems. Operationalizing human rights principles in mining decision making helps to achieve SDG 16, and, safeguarding biodiversity and healthy ecosystems.

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SwedBio is a knowledge interface at Stockholm Resilience Centre contributing to poverty alleviation, equity, sustainable livelihoods and social-ecological systems rich in biodiversity that persist, adapt and transform under global change such as climate change. SwedBio enables knowledge generation, dialogue and exchange between practitioners, policy makers and scientists for development and implementation of policies and methods at multiple scales.