



Improving the sustainability of freshwater services

Assessing voluntary measures in Minas-Rio using the IUCN Global Standard for Nature-based Solutions™

C. Borges, B. Almeida Souza, F. Astudillo, S. Edwards, and J. McBreen



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Cover photo: Protected area around Anglo American Minas-Rio operation plant in Brazil
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Executive summary

The IUCN Global Standard for Nature-based Solutions™ self-assessment tool is a recent framework for assessing the effectiveness of a potential NbS¹ intervention against eight good practice principles, associated with 28 criteria. As part of a collaborative learning exercise, teams from Anglo American and the International Union for Conservation of Nature (IUCN) jointly assessed a selection of voluntary restoration and conservation measures at the Minas-Rio iron ore mining site in Brazil.

The pilot assessment focused on a set of voluntary measures adopted by Anglo American to improve the sustainability of freshwater services from the Rio Santo Antônio Springs, in the river's upper watershed in areas close to mining operations. The springs are located in the Southern Espinhaço Mountain Range, a recognised UNESCO Biosphere Reserve since 2005. The potential impacts resulting from mining activities, such as reduced water flows, water pollution and increased erosion, can have a major impact on the quality and quantity of domestic water supplies for local communities. The voluntary measures assessed in the pilot to mitigate such impacts have been implemented by Anglo American, as part of a wider operational approach on land owned by third parties and local communities. These actions focus on springs and forest conservation/preservation, thus contributing to the preservation of surface water resources in areas designated for public water supply.

Despite some challenges in its application in the context of such a project, the NbS self-assessment tool proved to be a useful framework, and the process of using the tool involving technical teams, partners and stakeholders fully demonstrated its value. While the pilot concluded that the measures assessed do not fully adhere to the IUCN Global Standard for Nature-based Solutions™, it identified measures to improve its impacts and alignment with the Standard. In particular, efforts need to be made to guarantee that the measures put in place are well sustained over time and accompanied by robust monitoring to evaluate the results. The lessons learned from this pilot exercise will serve as a basis for future evaluations and, possibly, for the design of similar interventions.

1 As defined by the Resolution [UNEP/EA.5/Res.5](#) (UNEP, 2022a).

Acknowledgements

The assessment of voluntary measures to improve the sustainability of freshwater services at the Minas-Rio iron ore mining site in Brazil, using the IUCN Global Standard for Nature-based Solutions™, is the result of a collaborative effort between Anglo American and IUCN.

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List of acronyms

APP	<i>Área de Preservação Permanente</i> (Permanent Protected Areas)
CEBDS	Brazilian Business Council for Sustainable Development
FPIC	Free Prior and Informed Consent
GIS	Geographic Information System
IUCN	International Union for Conservation of Nature
NbS	Nature-based Solutions
NGO	Non-governmental organisation
RPPN	<i>Reserva Particular do Patrimônio Natural</i> (Private Reserve Natural Heritage)
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

1 Introduction

Under a three-year collaboration agreement, the International Union for Conservation of Nature (IUCN) and Anglo American set out to explore how Nature-based Solutions (NbS) can help deliver positive biodiversity outcomes and support climate-related goals, while delivering additional benefits for conservation and wider stakeholders. IUCN and Anglo American are working together to understand how the company can identify and apply NbS and new approaches across the full mining lifecycle. Notable examples of such NbS include activities such as forest restoration, preservation of riparian forests, as well as climate mitigation or adaptation initiatives. IUCN is supportive of the development and implementation of strategic corporate commitments by the company towards sustainable natural resource management, which contributes to global societal goals.

This report provides an overview of the IUCN's Global Standard for Nature-based Solutions™ assessment outcomes and process at the Minas-Rio operation, an iron ore mining facility site operated by Anglo American in Brazil. Situated within Conceição do Mato Dentro, Minas Gerais, Brazil, the mine² is located in an area of high biodiversity value – the Southern Espinhaço Mountain Range. The site was officially recognised by UNESCO in 2009 as a Biosphere Reserve.³

The Espinhaço Mountain Range serves as a geographical divide, demarcating the São Francisco River Basin and other smaller – but highly important – basins that ultimately discharge into the Atlantic Ocean, such as the Rio Doce and the Rio Jequitinhonha Basins. In addition, this mountain range ranks as Brazil's

largest and most continuous Precambrian orogenic belt of the country's territory. In the Conceição do Mato Dentro region, freshwater quality and quantity are increasingly challenging issues, most particularly for local communities. This critical concern has been underscored by the studies conducted by Souza et al. (2021) and Siqueira-Gay and Sánchez (2022), both of which have emphasised the paramount importance of freshwater supply as an essential ecosystem service in this region. In addition, mining activities might have the potential to affect surface and groundwater resources, particularly when it comes to activities involving the extraction and processing of iron ore, for which water is a key resource. Consequently, the potential repercussions on this ecosystem service have garnered significant attention. Potential adverse impacts caused by mining activities, including the reduction of water flows due to the aquifer dewatering or water pollution associated with mining activities, could threaten the provision of domestic water to certain communities. In addition, the escalation of erosion processes, another impact associated with mining operations, has the potential to not only alter water quality but also disrupt the equilibrium of water quantity in the area.

Therefore, it is important to address these concerns through extensive freshwater monitoring and dissemination of results. Furthermore, the outcomes of this monitoring could serve as the basis for concrete corrective actions, forming an integral component of an adaptive management strategy. Since the implementation of its mining operation in Minas-Rio, Brazil, the company has been adopting measures to promote water conservation within

2 The overall mining complex is composed of a mine located in Conceição do Mato Dentro (Minas Gerais), a beneficiation plant located in Alvorada de Minas City (Minas Gerais), a pipeline that cross 33 municipalities in Minas Gerais e Rio de Janeiro, and a filtration plant located in São João da Barra City (Rio de Janeiro).

3 For further information, please see the website of UNESCO Espinhaço Range Biosphere Reserve: <https://en.unesco.org/biosphere/lac/espinhaco#:~:text=The%20Espinha%C3%A7o%20Mountain%20Range%20represents,directly%20into%20the%20Atlantic%20Ocean.>

regions designated as permanent preservation areas (APP), as mandated by Brazilian law. This impetus is driven by both legal requirements and voluntary commitments related to delivering positive biodiversity outcomes. Among these commitments are initiatives incentivising the restoration of privately-owned lands, primarily through the recovery of native vegetation around freshwater springs and forest fragments.

In this context, the objective of the assessment based on the IUCN Global Standard for Nature-based Solutions™ was to analyse the measures taken by Anglo American pertaining to the enhancement of water security, with specific emphasis on water quality and supply. This assessment aimed to gauge the alignment of those measures with the established criteria in the NbS Standard. To initiate this process, an initial screening exercise was conducted, involving a comprehensive review of multiple measures and programmes, with the objective of identifying those that exhibited potential compatibility with the NbS framework. Subsequently, following the outcomes of this screening process, IUCN and Anglo American decided to focus the analysis on the measures applied for the conservation of the Rio Santo Antônio Springs, in the river's upper watershed. Although not initially conceived as formal NbS actions, the set of measures implemented as part of wider operational approaches were considered by Anglo American to be NbS interventions. The pilot exercise resulted in important learning for both IUCN and Anglo American teams. These insights not only contribute to the refinement of future assessments but also hold the potential to inform the design of similar future interventions.

BOX 1

Definition of Nature-based Solutions

Nature-based Solutions (NbS) are “actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems, which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits” (UNEP, 2022, p. 2). These actions benefit both biodiversity and human well-being. Increasingly, businesses, governments, communities and NGOs are embracing NbS actions, because they realise that investing in nature is not only cost effective but reduces environmental risks and builds greater resilience.

In the context of water management, NbS are an umbrella term for a range of activities which utilise natural processes to provide water-related ecosystem services and benefits, either through raw water protection, wastewater treatment or flood mitigation (Figure 1).



Figure 1 – Illustrative definition of Nature-based Solutions

Source: IUCN (2020, Figure 2, p. 3)

2 Methodology

2.1 Study area

Anglo American is one of the largest mining companies in the world, with a turnover of approximately US\$ 35.1 billion in 2022.⁴ The company has three operations in Brazil, with one of them being the Minas-Rio operation (Figure 2). Notably, this operation includes the largest existing slurry pipeline, extending 529 km from Minas Gerais state to the Açu port situated in the state of Rio de Janeiro.

The mine began operating in 2014 after its environmental and social impacts were assessed in accordance with Brazilian National and State legislation (Fonseca et al., 2017). The mine consists of an open pit, waste rock dumps, ore treatment plant, tailings dam and ancillary facilities, with a production capacity of 26.5 million tonnes of iron ore concentrate per year.⁵ It has a projected operational lifespan extending until 2074, with potential expansion prospects under consideration.

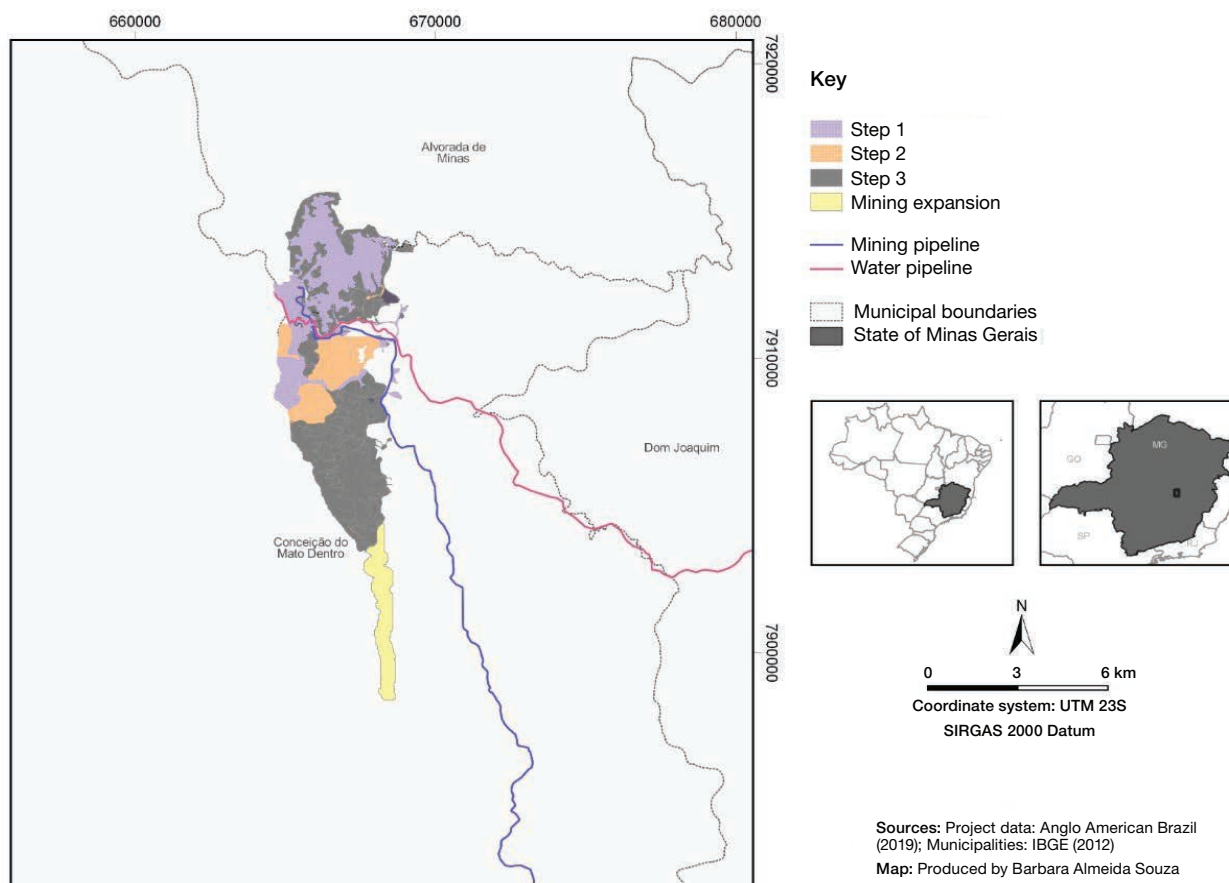


Figure 2 – Location of the different structures of the Minas-Rio mining

4 Anglo American Preliminary Results 2022. Available from: <https://www.angloamerican.com/media/press-releases/2023/23-02-2023>

5 Anglo American Minas-Rio Fact Sheet – September 2011. Available from: https://www.angloamerican.com/media/~/_/media/Files/A/Anglo-American-Plc/media/AngloAmerican_FS_Minis%20Rio.pdf

The area reviewed in the pilot includes the eastern face of the southern portion of the Espinhaço Meridional Mountain range.

Significantly, this region has been designated by the State Zoning Report⁶ as an area characterised by very high natural vulnerability (“unable to resist or to recover from negative anthropic impacts”) and of high priority for conservation and restoration of natural resources.

In addition, the Biodiversity Atlas of Minas Gerais (IEF et al., 2021) considers the Rio Santo Antônio and its associated tributary watershed, the Rio do Peixe, to be of special priority for conservation. Given the direct influence of mining operations on the Rio do Peixe watershed, the upper reaches of the Rio Santo Antônio hold substantial regional importance in terms of both conservation and downstream water provision.

The region features fragments of sensitive phytophysiognomies of the Atlantic Forest biome, such as semi-deciduous forest and quartzitic or ferruginous rupestrian grasslands, both found on mountaintops. The ferruginous rupestrian grasslands ecosystems are characterised by high endemism, with less than 5% of their plant species being widespread (Jacobi & Carmo, 2012). These ferruginous grasslands are associated with iron ore deposits, rendering them frequent targets for mining projects. Nonetheless, offsetting impacts on these grasslands poses several challenges, primarily due to the scarcity of suitable offset areas outside mining leases (Fernandes et al., 2018), and the intricate nature of ecosystem restoration within this context (Silveira et al., 2016).

The mining operation also affects forest ecosystems at various conservation stages. These forests have been impacted since the 19th century when they were predominantly converted into pasturelands. Conversely, the quartzitic and ferruginous rupestrian grasslands

have largely maintained their conservation status, primarily due to their mountaintop’s location, unsuitability for grazing, lack of timber or firewood value and the unsuitability of their soils for agriculture.

The ore treatment relies on a wet process that depends on the utilisation of water sourced from the Peixe River,⁷ which is usually impacted from cities and farms along its course. This water is employed in various stages, including comminution in the grinding process and concentration through flotation, after which it is separated from the tailings. Subsequently, following the necessary treatment, the effluents are discharged in the tailing dams, which is used to re-circulate water in the process, reducing the abstraction of water in the Peixe River.

Communities that live in the surrounding area are rural. The most important economic activity is raising cattle, while small-scale agriculture and breeding animals, such as hens and pigs, are subsistence activities. Land tenure is characterised by large properties that shelter small-scale producers on a partnership basis. These communities use springs or wells for supplying water for both consumption and other needs. Additionally, the region’s rivers serve multiple purposes, including recreation, fishing, washing clothes and supplying of water for livestock. In several properties, sewage is discharged directly in creeks or into septic tanks.

The conflict over water between local communities and Anglo American’s operations in Brazil poses a challenge for the company in balancing its operations with the communities’ needs. Anglo American recognises the importance of water for local communities and is committed to responsible operations, aiming to reduce environmental effects and collaborating closely with local authorities to ensure sustainable water resource management.

6 For more information, please see the Minas Gerais State Economic and Ecological Zoning website: http://www.meioambiente.mg.gov.br/index.php?option=com_content&task=view&id=108

7 The ore produced at the mine is transported across 29 municipalities to the port in the state of Rio de Janeiro, where it undergoes a filtration process to separate water from the ore, which is stored for export. The effluent from this water filtration system is treated, with the majority of it discharged into the sea in accordance with legal standards.



Offset planting in permanent preservation areas

Photo by Agroflor

2.2 IUCN Global Standard for Nature-based Solutions™

The IUCN Global Standard for Nature-based Solutions™ is the first framework with clear parameters to guide users in the planning, implementation and scale-up of high-quality NbS actions. The Standard encompasses a comprehensive approach, considering the foundational elements of sustainable development, including biodiversity, economic considerations, and societal impacts. Furthermore, it incorporates resilience aspects into project management practices. The IUCN Global Standard provides a set of global NbS benchmarks in the form of eight criteria and 28 indicators (Table 1).

The Standard fosters a flexible approach, grounded in the foundational principle that NbS

actions should be adaptable to the specific context in which they are being implemented. This flexibility allows for a nuanced and context-specific approach to NbS initiatives. Functioning as an assessment tool, the Standard is accompanied by comprehensive guidance on the methodologies employed for its application. The scores obtained on each indicator are presented in a user-friendly format, utilising a traffic light system to categorise the performance. This final output of the assessment is presented through a table and a spider graph, which graphically represent the scores for each criteria, composed of several indicators. This visual representation serves as a valuable tool for users, aiding them in pinpointing areas of the NbS action that align with the Standard's criteria and those that may necessitate further attention or improvement.

Table 1 — Criteria and indicators for the IUCN Global Standard for Nature-based Solutions™

Source: IUCN (2020)

CRITERIA		INDICATORS	
1	NbS effectively address societal challenges	1.1	The most pressing societal challenges for rights holders and beneficiaries are prioritised
		1.2	The societal challenges addressed are clearly understood and documented
		1.3	Human well-being outcomes arising from the NbS are identified, benchmarked and periodically assessed
2	Design of NbS is informed by scale	2.1	Design of NbS recognises and responds to the interactions between the economy, society and ecosystems
		2.2	Design of NbS integrated with other complementary interventions and seeks synergies across sectors
		2.3	Design of NbS incorporates risk identification and risk management beyond the intervention site
3	NbS result in net gain to biodiversity and ecosystem integrity	3.1	NbS actions directly respond to evidence-based assessment of the current state of the ecosystem and prevailing drivers of degradation and loss
		3.2	Clear and measurable biodiversity conservation outcomes are identified, benchmarked and periodically assessed
		3.3	Monitoring includes periodic assessments for unintended adverse consequences on nature arising from the NbS
		3.4	Opportunities to enhance ecosystem integrity and connectivity identified and incorporated into the NbS strategy
4	NbS are economically viable	4.1	The direct and indirect benefits and costs associated with the NbS, who pays and who benefits, are identified and documented
		4.2	A cost-effectiveness study is provided to support the choice of NbS including the likely impact of any relevant regulations and subsidies
		4.3	The effectiveness of an NbS design is justified against available alternative solutions, considering any associated externalities
		4.4	NbS design considers a portfolio of resourcing options such as market-based, public sector, voluntary commitments, and actions to support regulatory compliance
5	NbS are based on inclusive, transparent and empowering governance processes	5.1	A defined and fully agreed upon feedback and grievance resolution mechanism is available to all stakeholders before an NbS intervention can be initiated
		5.2	Participation is based on mutual respect and equality, regardless of gender, age or social status, and upholds the right of Indigenous Peoples to Free Prior and Informed Consent (FPIC)
		5.3	Stakeholders who are directly and indirectly affected by the NbS have been identified and involved in all processes of the NbS intervention
		5.4	Decision-making processes document and respond to rights and interests of all participating and affected stakeholders
		5.5	Where the scale of the NbS extends beyond jurisdictional boundaries, mechanisms are established to enable joint decision-making among the stakeholders in those jurisdictions affected by the NbS
6	NbS equitably balances trade-offs between achievement of their primary goal(s) and the continued provision of multiple benefits	6.1	The potential costs and benefits of associated trade-offs of the NbS intervention are explicitly acknowledged and inform safeguards and any appropriate corrective actions
		6.2	The rights, usage of and access to land and resources, along with the responsibilities of different stakeholders are acknowledged and respected
		6.3	Established safeguards are periodically reviewed to ensure that mutually-agreed trade-offs limits are respected and do not destabilise the entire NbS
7	NbS are managed adaptively, based on evidence	7.1	A NbS strategy is established and used as a basis for regular monitoring and evaluation of the intervention
		7.2	A monitoring and evaluation plan is developed and implemented throughout the intervention lifecycle
		7.3	A framework for iterative learning that enables adaptive management is applied throughout the intervention lifecycle
8	NbS are sustainable and mainstreamed within an appropriate jurisdictional context	8.1	NbS design, implementation and lessons learnt are shared for triggering transformative change
		8.2	NbS inform and enhance facilitating policy and regulation frameworks to support its uptake and mainstreaming
		8.3	Where relevant, NbS contribute to national and global targets for human well-being, climate change, biodiversity and human rights, including the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)

2.3 Application of the IUCN Global Standard for Nature-based Solutions™

The application of the IUCN Global Standard for Nature-based Solutions™ in the case of this pilot consists of a three-stage process (Figure 3).

Pre-visit

The team responsible for conducting the assessment according to the Standard was composed of individuals from IUCN, an external reviewer and members of the Anglo American staff. As part of this assessment, the parties established shared objectives, serving as guiding principles throughout the process. The primary aim was to identify whether forest restoration measures implemented by the company could be considered as NbS according to the Standard, considering their contributions to enhancing water quality and providing benefits to the local communities (Figure 4).

The pre-visit (pre-assessment) phase was based on a desktop review of existing information prior to the site visit. The review focused on water and forest restoration assessments and plans. This step was intended to familiarise the team members with the local context, the company's project management systems and the range of activities being conducted. This phase included an identification of potential

NbS actions implemented by Anglo American which could subsequently undergo an evaluation using the IUCN Global Standard for Nature-based Solutions™. The pre-visit also helped in identifying any issues and gaps in information, thus allowing a more detailed on-site review.

Anglo American staff provided relevant documents, which included reports and studies pertaining to biodiversity, ecosystem assessment and management. Many of these internal reports (see Annex I) were prepared by external consultancies tasked with collecting and analysing data related to specific social and environmental aspects of the company's operations. From the set of documents provided, the team further screened those which were more specifically related to water quality and provision and forest restoration. These documents were reviewed in detail and are listed in section 3.

Visit

The visit phase took place between 27 and 29 September 2022, with the following objectives:

- To promote the exchange of information among the teams involved;
- To strengthen the Anglo American team's understanding of the IUCN Global Standard for Nature-based Solutions™; and
- To collect additional information for the assessment tool.

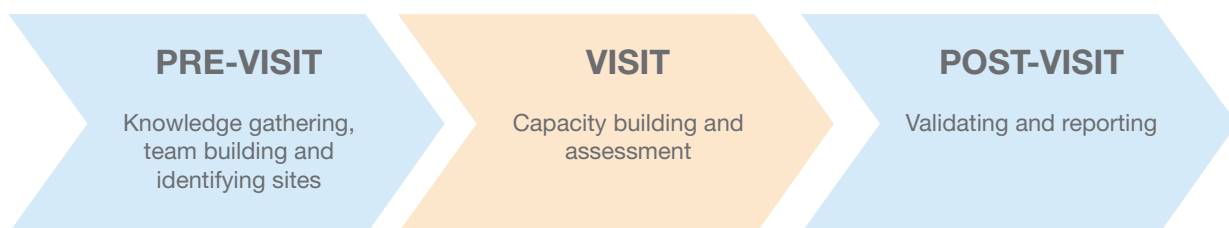


Figure 3 – Three-stage NbS assessment process

Source: Authors



IUCN team together with Anglo American staff who conducted the visit throughout the mining complex operations areas on the first day of the site visit.

Photo by Anglo American staff



View of the mining area, where mineral extraction can be seen.

Photo by Barbara Almeida



Mine activities on the east side of the Serra do Sapó Mountain.

Photo by Clarice Matos



West-side of the Serra do Sapó Mountain, where no mining activities are foreseen.

Photo by Clarice Matos



Sediment-retaining dike built to mitigate the impact caused by top-mountain erosion (visible on the top left corner of the photo) in local water courses

Photo by Barbara Almeida



The new Anglo American plant nursery

Photo by Rafael Ascanio



Forest resulting from native vegetation restoration more than 10 years old, in Anglo American's RPPN Rio do Peixe.

Photo by Clarice Matos



In the foreground, a young forest resulting from native vegetation restoration less than five years old. In the background, an older forest of natural regrowth, consisting of a mosaic with patches of rupestrian grasslands. The area pictured is inside Anglo American's RPPN Rio do Peixe

Photo by Clarice Matos



The team on the site visit in front of a fenced forest vegetation around a spring. The vegetation inside the fence is protected from domestic animals grazing and trampling, so it is allowed to naturally regrow.

Photo by Clarice Matos



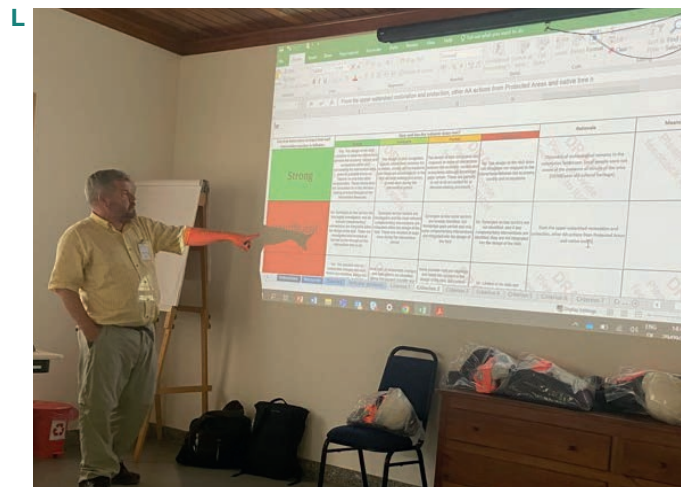
One of the 'small dams' built to slow down the outflow of the rainwater and to enhance soil water retention.

Photo by Clarice Matos



Concrete structure of a water trough for livestock. The trough is next to a fenced area of riparian forest, which surrounds a spring.

Photo by Clarice Matos



Meeting held with the IUCN and Anglo American teams for joint completion of the NbS Global Standard Assessment.

Photo by Barbara Almeida

On the first day of the site visit, the team went to the main areas within the mining complex (photos A and B). The visit was undertaken to gain first-hand insights into key locations within the mining operation. It allowed the team to gain a comprehensive understanding of the various operational facets and processes. Furthermore, the site visit provided an opportunity to familiarise the team with the local geographic context (photos C and D).

On the second day, the team visited in situ sediment retaining dikes (photo E). These structures were built by Anglo American to mitigate impacts that exceed the originally projected magnitude and intensity outlined in the impact assessments conducted prior to commencing operations. Specifically, these impacts concerned erosional processes originating from the upper sections of the excavated side of the Serra do Sapó Mountain, extending across to the unexplored side, and subsequently conveying eroded material with rainwater into local streams, resulting in detrimental effects on these water bodies.

The team also visited the Anglo American plant nursery (photo F) and the *Reserva Particular do Patrimônio Natural* (Private Reserve Natural Heritage, or RPPN in its Portuguese acronym) of Rio do Peixe, where they saw areas of forest restoration of more than 10 years old (photo G) and under five years old (photo H).

On the third and final day, the team visited the upper watershed of the Santo Antônio River, to see the measures implemented by Anglo American to protect the springs and improve the regional water quality and provision. Four distinct measures were instituted in a coordinated manner, collectively striving to rehabilitate ecosystem services related to water. This intervention was implemented on private lands around the river, where the landowners agreed and assisted with the activities. These measures encompassed the following:

- active planting to restore the vegetation around the springs,
- fencing a buffer area around the springs (photo I),
- building small dams in strategic locations (photo J), and
- installation of water troughs for cattle and other livestock (photo K).

During the visit, IUCN conducted meetings with Anglo American staff, and provided them with detailed guidance on the utilisation of the IUCN assessment tool in accordance with the NbS Global Standard. During the first meetings, the tool was partially completed with information by the IUCN team. Building on this foundation, the IUCN team and Anglo American collaboratively reviewed the data pertaining to the indicators outlined in the NbS Standard (photo L). At the end of the final day of the visit, the teams collectively completed the assessment based on the Standard's first criteria.

Post-visit: Final report

In this phase, all the necessary information was compiled and analysed, including the identification of gaps and recommendations. The documentation made available by Anglo American before, during and after the site visit was analysed by the team members and project representatives.

The assessment tool underwent three successive iterations after the site visit. The initial two iterations were carried out internally, involving solely the IUCN team, while the third iteration incorporated feedback and input from the Anglo American team. The next section of this report examines the results, presented in tables and graphs, obtained at each stage of the assessment. This method not only serves to present the specific findings concerning the assessed NbS interventions but also upholds a commitment to transparency and openness in the assessment procedure, while simultaneously safeguarding the confidentiality of pertinent information.

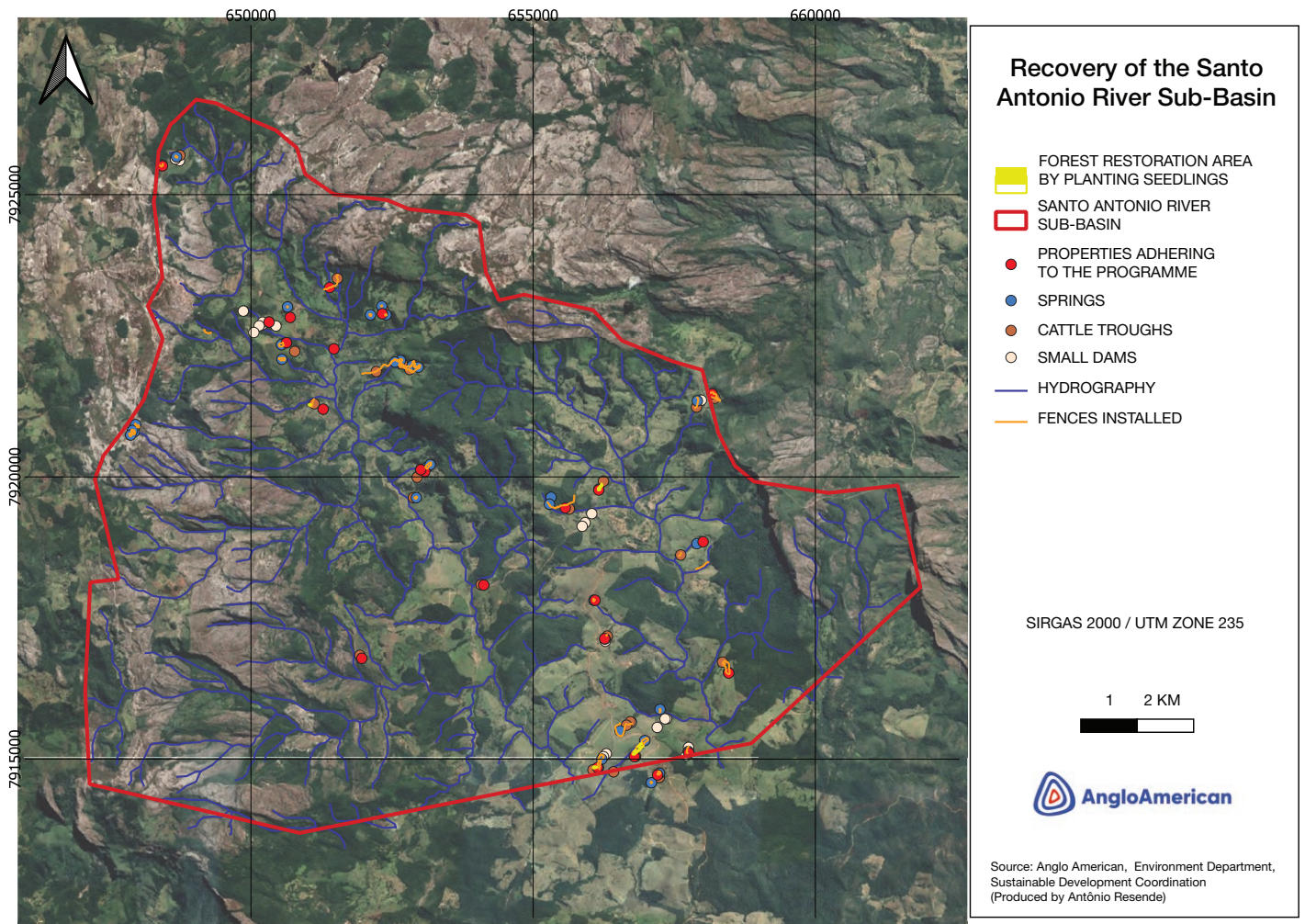


Figure 4 – Location of voluntary restoration measures adopted in the Rio Santo Antonio River Sub-Basin

3 Results

3.1 Desktop review

Given the absence of a pre-established NbS 'project' within the mining operation, the initial deliberations between the IUCN and Anglo American teams contemplated the examination of the company's ecological restoration initiatives as potential NbS actions. The primary objective was to assess how these ecological restoration activities could contribute positively to the sustainable provision of water ecosystem services. However, it became apparent that this approach was not feasible for the purposes of the assessment exercise. Therefore, the team selected the protection of springs as the Nature-based Solutions of the assessment. The results are presented in the next sections, which are based on the documents made available by Anglo American described in [Annex I](#).

Water management in Minas-Rio

In the Minas-Rio, encompassing both the mining area and its surrounding region, Anglo American has implemented a Water Resources Management Programme, incorporating a diverse range of water management initiatives. The goal is to monitor surface and underground water sources, ensuring compliance with legal regulations and safeguarding a stable water supply for the mining operations, local communities and other stakeholders in the region. The purpose is to prevent, control and mitigate any potential impacts on water resources that may arise. This entails the regular reporting of monitoring activities, with results derived from periodic sampling.

The programme involves the preparation of quarterly reports, which encompass assessments of biological, physical and chemical characteristics of both surface and underground water, along with daily measurements of waterflows originating from the Peixe River and

upper Santo Antonio Rivers and their respective tributaries. Monthly reports are also generated, focusing on the evaluation of sanitary and industrial effluents.

The main actions of Water Resources Management Programme encompass:

1. **Hydrometeorological monitoring:** evaluates the local precipitation patterns, weirs, fluviometric stations, and hydrogeologic behaviour.
2. **Quality of water and effluents monitoring:** evaluates physical-chemical and biological parameters of treated effluents and both superficial and underground water.
3. **Hydrobiological studies:** carried out in surface waters to provide ecological insights into invertebrate aquatic groups, including phytoplankton, zooplankton and macroinvertebrates. The latter group is used as a bioindicator, reflecting the environmental quality of water sources.
4. **Evaluation and Monitoring of Communities' Supply Systems Plan:** measures the quality of superficial water in eight surrounding communities.
5. **Dispersed Users Monitoring Programme:** describes a comprehensive overview of water usage within the community over time, focusing on the qualitative aspects of water resources. It involves identifying the source of abstraction, the purpose of usage and whether the supply is derived from the public/community network, treatment requirements, preventive or mitigation measures taken by the company, and any recreational uses. This programme was a measure implemented in response to meteorological anomalies experienced by the southeast region of Brazil between 2014 and 2017.

Mandatory and voluntary restoration measures

Currently, the company undertakes some mandatory forest restoration activities stemming from its prior actions involving the removal of Atlantic Forest vegetation and interventions in *Área de Proteção Permanente* (Permanent Protected Areas, or APP in its Portuguese acronym).

In instances where native vegetation in the Atlantic Forest biome has been removed, a flexible approach is adopted, allowing for the implementation of protection, restoration strategies, or a combination thereof. In contrast, when it comes to the removal of protected plant species and interventions in APP, restoration is mandated and typically carried out in proximate areas, often on privately-owned land. This modality presents risks of further degradation or unsuccessful restoration, for example, when some communities cut the site's fences to access and utilise the pasture areas.

Restoration of APP, which include a range of the riparian vegetation along rivers and streams, is a mandatory measure required by Brazilian federal legislation in cases of degradation. In the Minas-Rio, Anglo American usually fulfils this requirement by executing Technical Projects for Reconstitution of Flora. These projects are implemented whenever there are impacts on APPs due to the construction of mining-related infrastructure. These projects should adhere to the best practices in planting, with the results of these initiatives reported on a semi-annual basis following the beginning of the project.

The Recovery Program for Riparian Forests and Water Recharge Areas has been established to ensure compliance with mandatory federal and local licensing legislation. This programme intends to restore riparian forests as offsetting for interventions in APP. Such initiative is particularly important to the conservation of two endangered fish species that have been documented within the mine's area of influence.

Recovery of springs

Anglo American also implements initiatives related to the recovery of freshwater springs, which aims to protect, recover and preserve watersheds. To achieve this objective, the company has implemented permanent and integrated actions to promote the sustainable use of natural resources, as well as improve socio-environmental conditions and increase the availability of water both in terms of quantity and quality for various uses.

Springs are places where underground water flows naturally, albeit intermittently, and are designated as APP. Riparian forests in the APP play an important ecological role in protecting and maintaining water resources, as they control soil erosion and the consequent silting up and pollution of watercourses. The recovery of springs contributes to enhance water quality and quantity and may also bring some benefits to the landscape vegetation connectivity.

Among a number of spring and riparian forest recovery measures that Anglo American have been implementing over time, the spring protection programme was singled out for evaluation using the IUCN Global Standard for Nature-based Solutions™. While the agreement did not specify the actions to be performed, the company voluntarily chose to engage with the local community of the upper Santo Antônio watershed to promote springs protection in that region. The NbS intervention consisted of four actions, previously mentioned and illustrated in section 2 on methodology and described in further detail in the next paragraphs.

Actions carried out

The first action, considered one of the most pivotal, involved the **isolation of springs through the erection of protective fencing around their immediate vicinity**. This measure was intended to protect the springs from excessive usage and safeguard the riparian forests against damage caused by trampling and grazing, especially by livestock. Such protection was crucial in enabling forest regeneration. However, it is worth mentioning that fencing also limits landowners' access to water source.

In response to this limitation, the programme's second action was to **install water troughs** located outside the spring APP, primarily for the purpose of watering domestic animals. Importantly, these installations were carried out in collaboration with landowners, typically those engaged in cattle raising.

The third action involved **providing landlords with native species seedlings**, encouraging active restoration of the degraded forests surrounding the springs through the planting of these seedlings. The responsibility for this planting was delegated to the landowners themselves. However, it is noteworthy that this action encountered limited participation as only four landowners agreed to perform it.

The fourth action entails the **implementation of small ground-level dams** functioning as retention ponds. These ponds were strategically positioned to capture rainwater and facilitate the replenishment of underground aquifers. This approach served several crucial purposes, including the mitigation of soil erosion, prevention of river water contamination, reduction of flood risks and the provision of slow, year-round water filtration. Consequently, it contributed to maintaining the stability and perennial flow of watercourses and springs as a vital component of the broader conservation efforts. Complementary to these actions, stormwater containment boxes were installed. These are usually placed on the edges of rural roads or other strategic locations, so that they can contain the largest amount of water possible. This measure contributed to the preservation of unpaved roads by preventing erosion and redirected rainwater flow, thereby mitigating sediment transport in the affected areas.

In order to monitor the outcomes of these actions, Anglo American installed meteorological and water resources monitoring equipment in the main sites where the intervention took place. Three devices were deployed: one digital pluviography for precipitation recording, a station to assess rainwater soil infiltration and subsurface runoff, and a station designed to measure the water flow measuring in small watercourses.

Teams of specialists were responsible for the installation process and provided training to local communities willing to engage in monitoring and manage the equipment over an extended monitoring effort. The objective was to establish sustainable long-term, community-led monitoring efforts. However, due to constraints within the scope of the agreement, company staff could not supervise the community monitoring with sufficient frequency to accurately assess the success of this strategy.

3.2 Outcomes of application of the Nature-based Solutions assessment tool

Following the initial application of the assessment tool, IUCN and Anglo American engaged in additional consultation to improve their understanding of what was required. This collaborative effort contributed to a more refined assessment.

The following are the results of the three successive iterations made of the assessment tool, reflecting the iterative process of application, review and refinement:

- **A – first iteration:** conducted immediately after the field visit; primarily an internal process within the IUCN team, with certain information still pending verification.
- **B – second iteration:** all new information was verified and the assessment was exclusively conducted by the IUCN team
- **C – third iteration:** performed collaboratively with Anglo American, involving their feedback and the incorporation of any additional information provided.

The results of these three steps are shown in the tables and spider web in [Figure 5](#).

[Figure 5](#) demonstrates that there were changes, along with the assessment process, in the

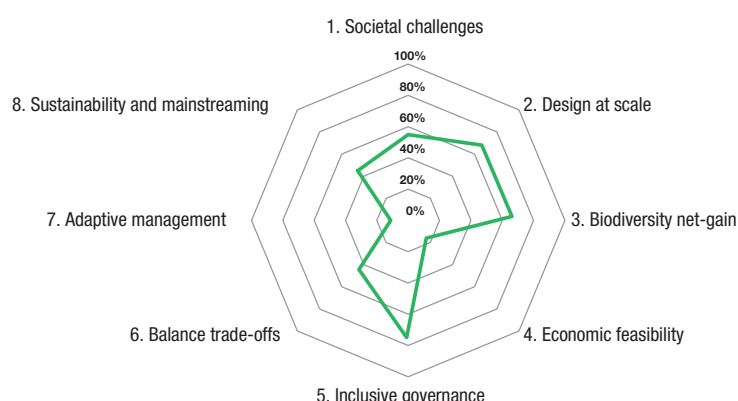
Key

- 4 Strong
- 3 Adequate
- 2 Partial
- 1 Insufficient

Final output
Criterion percentage

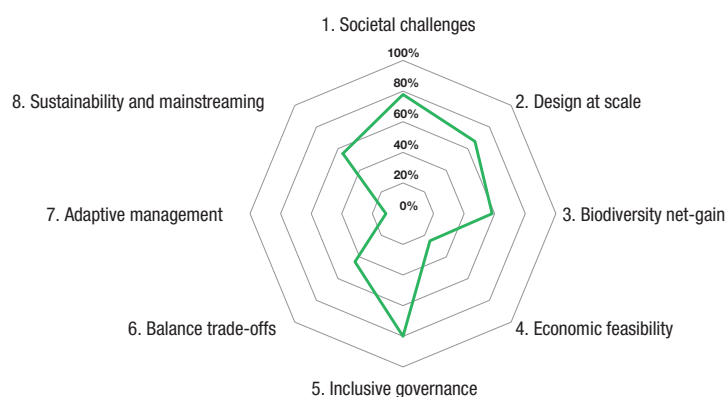
A – Iteration 1

Criterion	Criterion score	Maximum criterion score	Normalised criterion	Final output Criterion percentage
1. Societal challenges	5	9	0,56	56%
2. Design at scale	6	9	0,67	67%
3. Biodiversity net-gain	8	12	0,67	67%
4. Economic feasibility	2	12	0,17	17%
5. Inclusive governance	11	15	0,73	73%
6. Balance trade-offs	4	9	0,44	44%
7. Adaptive management	1	9	0,11	11%
8. Sustainability and mainstreaming	4	9	0,44	44%
Total percentage match				47%
Is this in adherence with the IUCN Global Standard for NbS?	Not in adherence			



B – Iteration 2

Criterion	Criterion score	Maximum criterion score	Normalised criterion	Final output Criterion percentage
1. Societal challenges	7	9	0,78	78%
2. Design at scale	6	9	0,67	67%
3. Biodiversity net-gain	7	12	0,58	58%
4. Economic feasibility	3	12	0,25	25%
5. Inclusive governance	12	15	0,80	80%
6. Balance trade-offs	4	9	0,44	44%
7. Adaptive management	1	9	0,11	11%
8. Sustainability and mainstreaming	5	9	0,56	56%
Total percentage match				52%
Is this in adherence with the IUCN Global Standard for NbS?	Not in adherence			



C – Iteration 3

Criterion	Criterion score	Maximum criterion score	Normalised criterion	Final output Criterion percentage
1. Societal challenges	7	9	0,78	78%
2. Design at scale	6	9	0,67	67%
3. Biodiversity net-gain	6	12	0,50	50%
4. Economic feasibility	3	12	0,25	25%
5. Inclusive governance	13	15	0,87	87%
6. Balance trade-offs	3	9	0,33	33%
7. Adaptive management	1	9	0,11	11%
8. Sustainability and mainstreaming	6	9	0,67	67%
Total percentage match				52%
Is this in adherence with the IUCN Global Standard for NbS?	Not in adherence			

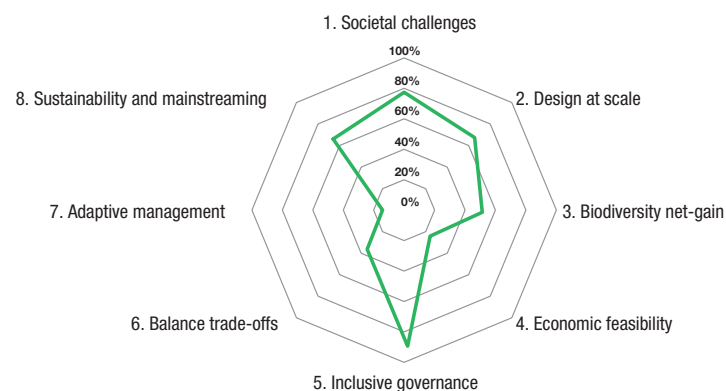


Figure 5 – Score results of the three-step Nature-based Solutions self-assessment process

Source: Internal documents (unpublished).

ratings of the criteria, resulting in the shifting of their respective percentages. As the assessment team collected documents and data demonstrating that the intervention meets the criteria in a robust manner, the rating improved. The spider graphs illustrate this evolution, which indicate that although the general shape of the graph polygon remained relatively consistent, it noticeably expanded and encompassed larger percentages as the assessment progressed and became more well-informed.

The results obtained in the final Step C represent the ultimate findings of this assessment:

The spring protection intervention reached its highest scores for Criteria 1 (Societal challenges) and 5 (Inclusive governance of the Standard).

Criterion 1, composed of three indicators, pertains to acknowledging and integrating the challenges faced by local communities. It emphasises the expectation that the NbS will contribute to help solving such issues.

Criterion 5, comprising five indicators, underscores the significance of effective communication between the community benefitting from a NbS intervention and those responsible for its implementation. It emphasises the need for community participation at all stages of NbS execution, and for values such as equality, respect and transparency. In this case, the Anglo American and the community affected by the intervention collectively investigated the local demands, decided on actions, specified their locations, implementation methods and designated responsible parties. They also established formal agreements with the landowners that would host actions in their lands. Prior to the spring protection programme, Anglo American already had frequent and consolidated communication with local communities, including a 24-hour grievance phone service that is well-known and used in the region. The municipality and civil society institutions were also involved in this program. Therefore, social aspects were well addressed by the company's intervention.

Three criteria reached intermediate scores (adherence between 50% and 80%), which include: (2) Design at scale; (3) Biodiversity net-gain; and (8) Sustainability and mainstreaming.

Criterion 2, composed of three indicators, assesses how the design of the NbS included wider and related perspectives, such as the socioeconomic context, other interventions in the region, and risks the NbS may bring in larger scale settings.

Criterion 3, consisting of four indicators, assesses whether the NbS is based on concrete biodiversity demands and measurements, enhances regional connectivity, and is subject to results monitoring and potential negative impact assessment on nature.

The three indicators of Criterion 8 focus on how the NbS contributes to drive transformation to current regulations.

In these three criteria, Anglo American scored lower when indicators required post-implementation results monitoring. Indeed, such direct monitoring by the company was not initially planned in the original programme, resulting in its absence or being relatively limited. Other than this aspect, Anglo American's NbS performed well and met the specified requirements.

The absence of post-implementation monitoring also contributed to low scores for Criteria 6 (Balance trade-offs) and 7 (Adaptive management).

Criteria 6 along with its three indicators, assesses how the trade-offs between the NbS benefits and possible negative effects are accounted for in the NbS intervention, including the ways to correct these effects, highlighting their social aspects.

Criteria 7, consisting of three indicators, primarily addresses the need for continuous NbS monitoring throughout its entire lifecycle to extract valuable lessons for promoting adaptive management.

Initially, the plan for this programme was that the communities themselves would monitor the



Property which received fencing and watering facilities, in Santo Antonio do Cruzeiro
Photo by Agrofior

NbS actions maintenance and results. People were trained to operate monitoring equipment and signed formal agreements with Anglo American authorising the implementation of NbS interventions on their lands. The intention was to establish a sustainable process through community collaboration, which aims to create a more inclusive, transparent and adaptive procedure for implementing and monitoring NbS interventions. However, the almost complete absence of monitoring by the company represented a significant gap in achieving adherence to the NbS Standard. This monitoring is crucial in practice, as the field visit revealed some partially damaged structures. While Anglo American's strong relationship with the local community have been an asset in the region, direct communication with individuals involved in this specific programme appears to have ceased after implementation. Sustaining this communication, coupled with periodic visits to monitor NbS interventions and their outcomes, would likely be the missing element of adaptive management in this intervention.

Finally, **Criterion 4 (Economic feasibility)** also received a low score, comprised of four

indicators, revolve around the cost-benefit studies made prior to NbS implementation, which considered direct and indirect costs, alternatives to the NbS chosen and how it will be financed. The main challenge for Anglo American was the lack of cost-benefit analyses which would have provided a rationale for choosing this intervention over others. Part of the explanation for this is that the NbS actions were decided jointly with the local community and focused on addressing their current demands. However, an evaluation of the costs and the benefits of the actions could have better informed the planning process.

Box 2 summarises the main recommendations that came out from the collective work on the self-assessment. These suggestions are intended to support the company's ongoing efforts and affirm that they are on the right path. More detailed information on the findings of the assessment is presented in [Annex III](#).

The assessment using the IUCN Global Standard for Nature-based Solutions™ in Minas-Rio and recommendations available in [Annex III](#) provided an important learning opportunity for all stakeholders involved.

BOX 2

Recommendations based on the Nature-based Solutions self-assessment

Criterion 1 – Societal challenges

Anglo American is encouraged to consolidate data from its Minas-Rio operations and develop a GIS geoportal, facilitating well-informed decision-making for NbS interventions. Additionally, enhancing human well-being monitoring within the watershed will contribute to evaluating NbS outcomes effectively.

Criterion 2 – Design at scale

Anglo American is advised to continuously monitor synergies across the intervention's timescale. Developing a robust risk management plan is essential, ensuring the prevention of negative impacts and actively addressing observed breaches. Engaging in consultations with landowners is a proactive step to enhance positive impacts, making it easier to consider the potential effects of climate change.

Criterion 3 – Biodiversity net gain

Efforts can also be made to systematise information obtained through community monitoring equipment, aligning with upcoming monitoring through, for example, eDNA analysis. Clearly documenting connectivity priorities and the intervention's contributions to landscape connectivity will add value to the company's conservation efforts.

Criterion 4 – Economic feasibility

Economic Feasibility can be further supported by conducting an analysis of indirect benefits and providing detailed Impact Assessment documents, particularly concerning water quantity and usage. Utilising data from the Environmental Impact Assessment (EIA) document will strengthen the justification of the programme as an NbS measure.

Criterion 5 – Inclusive governance

Inclusive Governance can be reinforced by utilising existing 'coexistence committees' as effective communication channels with the community, facilitating productive discussions about the NbS intervention. Applying Free, Prior, and Informed Consent criteria demonstrates a commitment to ethical practices, promoting transparency and mutual understanding. Additionally, engaging in a multi-scale and multi-sector analysis aligns completely with the company's principles of social engagement, fostering positive relationships with stakeholders.

Criterion 6 – Balance trade-offs

Balancing Trade-offs requires connecting and explicitly documenting corrective and preventive measures, ensuring a comprehensive understanding for a successful cost-benefit analysis. Regular property visits to monitor maintenance will ensure the long-term effectiveness of NbS structures, reinforcing the company's dedication to sustainability.

Criterion 7 – Adaptive management

Adaptive Management is further supported by the creation of a comprehensive spring restoration strategy report, providing clarity about the intervention's objectives. An adaptive management approach, coupled with improved monitoring, showcases the company's commitment to continuous improvement. Engaging with regional committees and collaborating on projects demonstrates proactive involvement, leading to shared knowledge and enhanced outcomes.

Criterion 8 – Sustainability and mainstreaming

Incorporating engagement and communication with landowners/users into Anglo American's communication and education strategy is highly recommended. This proactive step will foster better collaboration and enable the sharing of valuable lessons learned. Utilising platforms such as the Initiative for Responsible Mining Assurance (IRMA) and other strategic networks can amplify the positive impact of these interactions.

Furthermore, exploring the prospect of extending the spring protection intervention to Anglo American operations in countries like Chile, Namibia, and beyond is a promising avenue. This expansion not only aligns fully with the company's Sustainable Mining Plan but also signifies a significant contribution towards broader environmental conservation efforts.

Source: UNEP (2020b)

4 Key lessons and next steps

Despite some challenges in using the tool (see [Annex II](#)), it reinforced the notion that the NbS Standard serves as a valuable framework for assessing projects considered as NbS, and highlights the inherent value of the process of applying the Standard itself. As a result of this collaborative project, IUCN and Anglo American identified the following overall learnings:

- Involvement of the technical teams was proven to be fundamental for a successful completion of the assessment tool.
- Frequent engagement with Anglo American staff was essential for a full understanding of the NbS intervention and accessing essential documents and information to facilitate the assessment. In-person meetings played a vital role in strengthening this interaction.
- Assessment depends on preliminary documentary analysis: the active involvement of company representatives at the outset can bring benefits for a more effective process, especially with regard to the collection of technical information about the project under evaluation.
- Site visits represent an important space for all parties to align their understanding of the NbS activities, the IUCN Global Standard for Nature-based Solutions™, the self-assessment tool, as well as initiate discussions about potential outcomes.
- Other stakeholders involved in the project, such as small landowners that are beneficiaries of the project, consultants responsible for the design phase and representatives of the municipality, should have been consulted. Such consultation would have brought a broader perspective and the final recommendations could have been more comprehensive.

Anglo American provided important feedback pertaining to the ownership of the lands where the NbS are implemented. In this case, all NbS actions occurred in third parties' lands owned

by the local communities, limiting the company's control over the intervention, especially in areas impacted by cattle grazing. It was also highlighted that the communities have many mandatory monitoring programmes, but only in areas within their ownership. Therefore, Anglo American suggested the tool to somehow recognise such a difference in land ownership, or undertake separate evaluations for different ownership scenarios.

Anglo American staff involved in the self-assessment with the NbS Global Standard were interested in the process and satisfied with the framework, tool and outcomes. They expressed willingness to carry out the assessment process again in the future, potentially addressing gaps in the NbS intervention and enhancing its adherence to the Standard. There are thus several opportunities for the next steps, including:

- The re-assessment of the same intervention using the Standard in the future when changes occur and/or actions against specific criteria have been deployed, allowing for improvements and enhanced adherence;
- The application of the Standard to other activities conducted by Anglo American in other units of the company that have the potential to be considered as NbS; and
- The application of the Standard to inform the design of carbon offsets projects based on forest restoration that Anglo American intends to establish soon, which could qualify as NbS intervention. However, a carbon crediting standard would have to be used for the purpose of the issuance of carbon credits.

Finally, key learnings from this assessment will be useful to Anglo American to better prepare for the future NbS certification process, which IUCN is currently developing and which could be of interest to Anglo American.



Protected area by Anglo American – Rio do Peixe
Photo by Agroflor

5 Conclusion

Economic actors have a crucial role to play in shifting their business models from nature-negative to nature-positive contributions, while identifying and disclosing their impacts and dependencies on biodiversity and ecosystem services. In line with recent international discussions regarding conservation targets, Anglo American has a clear goal to help deliver positive biodiversity outcomes with a great potential to generate additional benefits for conservation and wider stakeholder communities.

Setting conservation objectives and targets for conserving some ecosystem services, such as freshwater, is a possible way for project level initiatives to increase the delivery of benefits for society. Achieving this ambitious goal requires the adoption of innovative science-based practices that go beyond legal compliance.

The adoption of NbS has been recognised as a fundamental measure, because they can simultaneously address challenges related to environmental degradation and social needs. In this context, the IUCN Global Standard for Nature-based Solutions™ holds the potential to serve as a crucial indicator of Anglo American's progress toward its goal.

The Minas-Rio programme for the protection and restoration of springs evaluated in this report has the potential to achieve a high level of adherence to the IUCN Global Standard for Nature-based Solutions™. The programme, even if applied

on a small scale, can promote gains in terms of water quality. To ensure this positive outcome, continuous efforts are imperative to guarantee the ongoing adoption of these measures, including the maintenance of infrastructure and robust monitoring to assess positive results.

Although the measures assessed show a potential to fully adhere to the IUCN Global Standard for Nature-based Solutions™, it also enabled the identification of measures to improve its impacts and adherence to the Standard. Indeed, a significant gap ascertained throughout the evaluation process is the absence of a systematic approach by Anglo America to report information that could serve as evidence of full compliance with the Standard's criteria. Additionally, the fact that the properties involved are not owned by the company increases the complexity of the context, as it limits the company's autonomy over the implemented measures, requiring a high level of engagement from the property owners as many of their lands are currently impacted by cattle grazing.

Nevertheless, with its long-term investment and presence in a region of great importance for biodiversity and freshwater resources, Anglo American has the opportunity to play a significant role in driving the uptake and implementation of NbS in the State of Minas Gerais.

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Annex I – List of internal documents (unpublished) used in the assessment

DOCUMENT	YEAR	AUTHOR
Plano de controle ambiental do Sistema Minas-rio (Minas-Rio System environmental control plan)	June 2021	Anglo American
Programa de gestão de recursos hídricos do Sistema Minas-Rio (Minas-Rio System water resources management programme). Atendimento às condicionantes (Compliance with conditions): 4 E17 Da Lo 123/20141, 8, 9 E 15 Da Lo 156/20161 E 15 Da Lp+Li 001/20186, 8 E 9 Da Lo 320/20192 Da Lo 3713/2021	March 2022	Instituto SENAI de Tecnologia em Meio Ambiente (SENAI Institute of Environmental Technology)
Programa de recuperação de matas ciliares e áreas de recarga hídrica: relatório anual das atividades realizadas no período de janeiro a dezembro de 2020 (Recovery programme for riparian forests and water recharge areas: annual report on activities carried out between January and December 2020)	March 2021	Anglo American
Relatório técnico de acompanhamento dos usuários disperses (Technical report on monitoring dispersed users)	March 2022	Instituto SENAI de Tecnologia em Meio Ambiente (SENAI Institute of Environmental Technology)
Programa de reconstituição dos campos ferruginosos da Mina Do Sapo Relatório Anual De Atividades período Janeiro a Dezembro de 2021 (Reconstruction programme for the ferruginous fields of Mina Do Sapo Annual Activity Report January to December 2021)	March 2022	Anglo American
Plano de utilização pretendida (PUP) simplificado (Simplified intended use plan (UUP))	September 2018	Anglo American
Programa de educação ambiental PEA – Sistema Minas-Rio (Environmental education programme PEA – Minas-Rio System)	March 2022	Anglo American
Plano de controle ambiental (PCA): Programa De Reabilitação De Áreas Degradadas (Environmental Control Plan (PCA): Degraded Areas Rehabilitation Programme)	July 2021	Anglo American
Equivalence, additionality and permanence: a pathway for evaluating the potential of biodiversity offsets to achieve net gain	August 2022	University of São Paulo
The potential of a large mine-site to achieve biodiversity net positive gain	August 2022	University of São Paulo
Realização de ações de conservação nas cabeceiras do Rio Santo Antônio – Conceição do Mato Dentro – MG (Carrying out conservation actions in the headwaters of the Santo Antônio - Conceição do Mato Dentro – MG)	August 2021	Centro Brasileiro para Conservação da Natureza e Desenvolvimento Sustentável (Brazilian Centre for Nature Conservation and Sustainable Development)
Caracterização Fisiográfica da Bacia Hidrográfica Rio Santo Antônio (Physiographic Characterisation of the Santo Antônio River Basin)	May 2021	Agroflor Consultoria

Annex II – An overview of the challenges in using the self-assessment tool and suggestions for improvement

Using the IUCN Global Standard for Nature-based Solutions™ self-assessment tool to evaluate Anglo American's NbS source protection intervention, the team encountered a few challenges. Some indicators were perceived as too rigorous for implementors of voluntary NbS projects, such as those led by Anglo American and potentially other private sector actors. For example, Indicator 8.1 requires a communication strategy for the NbS intervention from the beginning of its implementation, which seems very demanding. Requiring further details on how the strategy would trigger transformations in society may also be difficult to apply within an operation site context. An adaptation of the requirements for these indicators in the context of small-scale projects could be of relevance.

Part of the information in the indicator's description remains unclear or difficult to understand for people who are not experts of the NbS concept. To make the process of completing the self-assessment spreadsheet more efficient, it would be helpful to have specific terms and concepts more clearly explained in the description text, in the criterion tab and/or a Glossary.

An example that covers both these issues is Criterion 6, which evaluates whether the NbS intervention measured all trade-offs an action could possibly have before and during its implementation. In the tool, the nature of these trade-offs is not clearly described, which prevents the generation of a comprehensive assessment. Furthermore, the added-value of this criterion to assess whether an action is a NbS or not was not clear to the team, since this specific information is not directly related to neither the NbS nor the ecosystem service it intends to recover.

The team suggested, for a potential future revision of the tool, to consider specific weighting of the indicators, based on their degree of direct relevance to the NbS under evaluation. This adjustment could enhance the tool's adaptability while ensuring that no indicator is disregarded.

Annex III – Results of the self-assessment in Minas-Rio based on the IUCN Global Standard for Nature-based Solutions™

CRITERION 1 – NbS effectively address one or more societal challenges				
Indicator 1.1	The most pressing societal challenges for rights holders and beneficiaries are prioritised			
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are societal challenges identified? – Are rights holders and beneficiaries consulted? – Are the most pressing societal challenges for rights holders and beneficiaries prioritised? 	STRONG	<p>Societal challenges addressed water security and social and economic development. Decisions about the proposed actions for the spring protection intervention were made in consultation with the local community involved (Santo Antônio do Cruzeiro) and counted with the participation of the Conceição do Mato Dentro Town Hall (local government) and the NGO Centro Brasileiro para Conservação da Natureza. There were seven interactions, which aimed to clarify doubts of the communities and listen to people's ideas and needs, allowing for community engagement.</p>	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, especially section 6.1 on mobilisation of local leaders and communities.</p> <p>Report related to monitoring water users around the basin, Monitoramento dos Usuários Dispersos</p> <p>There are other initiatives linked to water management that involve community engagement, such as those described in some projects to improve coexistence and conditions related to water supply systems in the communities surrounding the development.</p>	None
Indicator 1.2	The societal challenges addressed are clearly understood and documented			
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are the drivers and responses to the societal challenges identified? – Are the societal challenges understood at the relevant national/local context? – Are the societal challenges documented and accessible to affected stakeholders? 	STRONG	<p>Drivers and responses to societal challenges are well understood, as they were agreed upon with the local community. The main aim of the project is water security, with the project seeking to improve the condition of springs, proposed with the practical aim of helping to improve the quality and quantity of water in the region. The importance of the intervention to local communities was evident from the stakeholder engagement process, as well as at national level, since it is in accordance with Brazilian Federal law (Forest Code) and state laws. The springs and their buffer zone are designated for protection because they have been identified as critical to the conservation of essential ecosystem functions, such as ensuring a clean and steady water supply, regulating hydrological and weather cycles, protecting geological and soil stability, or conserving biodiversity. The drivers and responses are well documented in specific technical reports, made available to the local municipality, on Anglo American website, and also in environmental educational material, produced by Anglo American.</p>	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, especially section 2 on context and section 3 on justification.</p> <p>IUCN and Anglo American field visit and meeting</p>	<p>Anglo American could explore opportunities to consolidate data and information generated from the company and related operations at Minas-Rio into a database.</p> <p>There are also plans to develop a GIS geoportal. This would favour the idea of creating a data user-friendly and easily accessible database to support informed decision-making at the regional level for ongoing and planned interventions.</p>

Sources: Internal documents (unpublished).



Indicator 1.3		Human well-being outcomes arising from the NbS are identified, benchmarked and periodically assessed		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are human well-being outcomes relevant to the identified societal challenges identified? – Are there benchmarks in place to monitor impact? – Are outcomes and benchmarks assessed at regularly occurring intervals? – Are human well-being outcomes incorporated into the strategy for the intervention? 	PARTIAL	<p>The following human well-being outcomes are identified: i) generation of economic and social incentive for the communities in rural area, avoiding emigration and consequent problems in urban centers; ii) increase in productive sustainability, by adding environmental values to local small-holders agriculture; iii) reduction of the growing risk of contamination and degradation of the region's springs, due to anthropic actions such as agriculture and cattle-raising; iv) reduction of the degradation of the vegetation that protects the springs and the riverheads; v) reduction of soil degradation, with consequent silting up of water courses. However, there are neither clear benchmarks for each of the four actions of the intervention; nor are the human well-being outcomes periodically assessed. A part of the monitoring was assigned to trained community members but the results have not yet been systematised and analysed.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p>	<p>Anglo American could explore opportunities to increase human well-being monitoring of outcomes within the watershed. With the intervention started around a year ago, a more direct monitoring could still be carried out in a near future. Part of the monitoring was assigned to trained community members, but it would be adequate that they would also be monitored by Anglo American or the municipality.</p>

CRITERION 2 – Design of NbS is informed by scale

Indicator 2.1		Design of NbS recognises and responds to the interactions between the economy, society and ecosystems		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are interactions identified between the economy, society and ecosystems? – Does that include those within and surrounding the intervention area? – Is the change in these interactions considered over time? – Are potential knock-on impacts on and from other areas identified? – Are these interactions used to design the intervention and decision making processes? 	STRONG	<p>Economy and society were taken into account in the design, since all relevant landowners were previously consulted about their willingness to have a spring protection inside their property. The municipality who also participated. Since cattle raising is one of the main economic activities in the region, water troughs were built in sites chosen together with the landowners. Some actions initially suggested by Anglo American were omitted or reduced following community consultation such as the implementation of seedling nurseries. Thus, such interactions influenced decision making. Ecosystems were also accounted for, since the springs to be protected were also chosen according to their degradation level and strategic upstream sites.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, especially section 6.1 on mobilisation of local leaders and communities, and section 9.9 which provides information about the Community Nursery of the Tapera Community Association</p> <p>Field visit and meeting</p>	<p>None</p>

Indicator 2.2		Design of NbS integrated with other complementary interventions and seeks synergies across sectors		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges

<ul style="list-style-type: none"> – Are complementary interventions identified in and around the area? – Is the design of the NbS integrated with relevant complementary interventions? – Are synergies sought in project management, monitoring and outcomes? – Are complementary interventions and synergies re-assessed throughout the intervention time scale? 	ADEQUATE	<p>Actions in the watershed were accounted for when choosing the intervention sites, such as restoration and protection of vegetated areas at the upper watershed. Synergies with other Anglo American actions were considered, such as native tree nursery, establishment of Protected Areas, eDNA and other monitoring systems throughout the watershed. However, these synergies were not tracked throughout the intervention time scale.</p>	<p>Anglo American reports on the spring protection actions:</p> <ul style="list-style-type: none"> - Realização de ações de conservação nas cabeceiras do rio Santo Antônio - Conceição do Mato Dentro - MG - Programme for Recovery of riparian forest and water recharge area also provides information on initiatives for the recovery of important protected areas in the basin. <p>Field visit and meeting</p>	<p>Monitoring the way the synergies work across the timeline of the intervention is important to see if they are changing and, most importantly, how these changes affect the outcomes. Such monitoring would be recommended to Anglo American.</p>
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Indicator 2.3		Design of NbS incorporates risk identification and risk management beyond the intervention site		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Have the drivers of internal and external risks been identified? – Has scientific and local knowledge concerning those risks been taken into account? – Does the design of the NbS take into account possible internal and external risks? – Has a risk management plan been integrated into the design of the NbS? – Will this risk management plan be revisited throughout the intervention time scale? 	PARTIAL	<p>The mitigation factors were defined using scientific and local knowledge and experience. The interventions were made based on permission documents with land owners/users. However, there is neither a risk management plan to assess risks (e.g. erosion risks) during the intervention implementation, nor afterwards.</p>	<p>Anglo American report on: Conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Field visit and meeting</p>	<p>A risk management plan for this intervention could be an opportunity for Anglo American to avoid some negative impacts following activities (e.g. the evidence during the field visit of one of the dams that appeared to have a manmade breach, presumably by the landowner). It also recommends consultation with the landowners to identify the causes of failure and enhance the positive impacts.</p> <p>Another important type of risk to be considered is the potential impact of climate change on the measures implemented.</p>

CRITERION 3 – NbS result in net benefits to biodiversity and ecosystem integrity

Indicator 3.1 NbS actions directly respond to evidence-based assessment of the current state of the ecosystem and prevailing drivers of degradation and loss				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is the current state of relevant ecosystems assessed? Is this assessment at the appropriate spatial and temporal scale? – Are the drivers of ecosystem degradation and biodiversity loss assessed? – Does the assessment include field verification? – Does the assessment take into account scientific and local knowledge? – Do NbS actions respond to the assessment and identified drivers of degradation and loss? 	STRONG	<p>The intervention was planned according to the specific ecosystem characteristics of each site. Some degradation drivers have been identified such as siltation, high erosion rate, forest fragmentation</p> <p>The project always considered the scientific and local knowledge. The incorporation of local knowledge was based on listening to the owners regarding the best area for the installation of the structures as well as on opportunities to improve farming practices.</p> <p>The actions implemented (water troughs, seedling planting, fencing and small dams) changed from site to site, precisely because they addressed the specific needs of each site and landowners.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, mainly in section 6.3</p> <p>Primary diagnosis on farms</p> <p>Field visit and meeting</p>	<p>As an improvement point for the programme is to develop a strategy for monitoring the results of the implemented measures.</p>
Indicator 3.2 Clear and measurable biodiversity conservation outcomes are identified, benchmarked and periodically assessed				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are clear and measurable biodiversity conservation outcomes identified? – Are these outcomes based on an understanding of the current ecosystem state? – Are these outcomes applicable to the relevant period of time for the intervention? – Are benchmarks for desired change in place? – Are the conservation outcomes periodically assessed? 	PARTIAL	<p>There are indirect measurements of biodiversity outcomes related to the intervention, such as water quality and flow monitoring within the micro-basin, as well as other projects' measurements in Minas Rio region. However, there is no specific biodiversity traits evaluated to measure outcomes, neither benchmarks established or periodic assessments in place. The expected results are that the protection of the spring areas and their surroundings can contribute to the re-establishment of water flow. The recharge areas also have to be properly preserved so that they absorb enough water to maintain the springs below. These and other practices acting together enable the necessary improvements to both the quantity and quality of water.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, especially section 9.1 on monitoring actions.</p> <p>Anglo American maintains in Minas-Rio system mine area and the surrounding region the Water Resources Management Programme, with different water management actions.</p> <p>Field visit and meeting</p>	<p>Within the programme, equipment was acquired to enable the community to monitor the results of these and other actions for the development of future action strategies. However, it is necessary that an effort be made to systematise this information.</p> <p>There is a forthcoming Anglo American monitoring through eDNA analysis. These results are promising and may represent an opportunity for the company to improve such indicator, to the extent that it will allow robust biodiversity traits monitoring.</p>

Indicator 3.3		Monitoring includes periodic assessments for unintended adverse consequences on nature arising from the NbS		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is a monitoring and assessment plan in place for ecosystems, species and ecological processes? – Is the monitoring plan based around measurable variables related to potential adverse impacts on nature arising from the NbS, both direct and indirect? – Are actions in response to those impacts in place? – Is the monitoring plan properly implemented with measurements taking place at periodic intervals? 	INSUFFICIENT	There is no monitoring plan. Potential adverse effects are not being assessed.	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, Conceição do Mato Dentro - MG, especially section 9.1 on monitoring actions.</p> <p>Anglo American maintains in Minas-Rio system mine area and the surrounding region the Water Resources Management Programme, with different water management actions.</p> <p>Field visit and meeting</p>	Even though monitoring of adverse effects was not planned by Anglo American, they showed willingness to think further about monitoring actions in general. As this interventions are still recent, it would be timely to implement a monitoring plan.
Indicator 3.4		Opportunities to enhance ecosystem integrity and connectivity identified and incorporated into the NbS strategy		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are the requirements to maintain or recover ecosystem integrity identified? – Are opportunities to enhance ecosystem connectivity and integrity assessed? – Are actions in response to these requirements and opportunities incorporated into the NbS strategy? 	ADEQUATE	The intervention was planned according to the specific ecosystem characteristics of each site, including their demands for ecosystem integrity recovery. Also, the carbon credits concept was included in the discussions and a local Committee established connectivity priorities for the area.	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, especially section 9.1 presents a section on Monitoring Actions</p> <p>Anglo American maintains in Minas-Rio system mine area and the surrounding region the Water Resources Management Program, with different water management actions.</p> <p>IUCN and Anglo American field visit and meeting</p>	It would be recommended that the connectivity priorities and the actual contributions that the intervention made to the landscape connectivity be made more explicit and clearly documented in the Anglo American report on spring protection.
CRITERION 4 – NbS are economically and financially viable				
Indicator 4.1		The direct and indirect benefits and costs associated with the NbS, who pays and who benefits, are identified and documented		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are the direct and indirect benefits and costs associated with the NbS and who receives them identified? – Is this fully documented? – Is this verified with key informants? – Can “winners” and “losers” be easily ascertained? 	INSUFFICIENT	The direct costs (such as fencing, building water troughs, inputs, community training) during the intervention implementation are clearly analysed and documented, but the indirect costs are not. Direct and indirect benefits are also acknowledged, although they are not clearly documented in the report.	<p>Anglo American report on the spring protection actions, Realização de ações de conservação nas cabeceiras do rio Santo Antônio, <i>Conceição do Mato Dentro – MG</i></p>	The analysis of indirect benefits should be performed to meet the indicator.

Indicator 4.2		A cost-effectiveness study is provided to support the choice of NbS including the likely impact of any relevant regulations and subsidies		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is cost-effectiveness analysed? – Does the study include upfront and recurring direct and indirect costs as well as the full flow of benefits overtime? – Are the key assumptions of cost-effectiveness identified? – Does the study include measuring the impact of any relevant regulations and subsidies? – Does the study support the choice of actions for the intervention? – Is a sensitivity analysis conducted against critical variables? 	INSUFFICIENT	Even though the direct costs for the intervention are clearly documented, no clear cost-effectiveness study was carried out. The impacts of regulations and subsidies were not analysed.	<p>Anglo American report on the spring protection actions, Realização de ações de conservação nas cabeceiras do Rio Santo Antônio - <i>Conceição do Mato Dentro – MG</i></p> <p>IUCN and Anglo American field visit and meeting</p>	Documents of Impact Assessment with information about the amount of water and its usage could also help improve the indicator. In any case, it should be considered that a similar action is more expensive when implemented by a mining company, mainly because of the security procedures.
Indicator 4.3		The effectiveness of an NbS design is justified against available alternative solutions, taking into account any associated externalities		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are available alternative solutions identified? – Is the intervention design's effectiveness justified against available alternative solutions? – Is this justification documented? Are associated externalities adequately taken into account? 	PARTIAL	Even though there was no formal analysis of potential alternatives to address the degraded upper watershed problem, this analysis was implicit in this intervention choice. Anglo American already acts to improve water provision and quality in other programmes, for example by restoring APPs and protecting other springs. Thus, this intervention was complementary to their other measures.	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Recovery programme for riparian forests and water recharge areas.</p> <p>Restoration measures and offsetting programme.</p> <p>Field visit and meetings</p>	In order to better document the selection of this programme as 'an NbS measure', data from the EIA document could be used to show why such intervention was chosen, since the analysis was focused on the whole area. Anglo American already has APP restoration projects in the region, as well as two other measures for spring protection. This was the third. The company's study on the physiography and regional work of NGOs shows the need to restore degraded springs.
Indicator 4.4		NbS design considers a portfolio of resourcing options such as market-based, public sector, voluntary commitments and actions to support regulatory compliance		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is there a comprehensive review of resourcing options? – Does this review cover the costs of delivery of the intervention's primary and ancillary benefits? – Has a full resourcing package been assembled and negotiated? – Does this resourcing package include provision for future revenue streams? 	ADEQUATE	The main resources come from Anglo American, but the municipality provides complementary resources and helped compliance with regulatory obligations. The community is also involved in the programme, even though it has not been monitored after the intervention implementation. Some NGOs are in contact with Anglo American to collaborate, but there is no formal agreement with them so far.	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>. The Municipality of Conceição do Mato Dentro/MG is identified in the report as a demanding party and cited several times in the document. The involvement of the Taperense Caminho da Liberdade Community Association and the Community Association for the Preservation of the Santo Antônio River Springs is present in different sections</p> <p>Field visit and meetings</p>	None

CRITERION 5 – NbS is based on inclusive, transparent and empowering governance processes

Indicator 5.1 A defined and fully agreed upon feedback and grievance resolution mechanism is available to all stakeholders before an NbS intervention can be initiated

Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is there a legitimate feedback and grievance mechanism? – Are affected stakeholders consulted for the development of this mechanism? – Is this mechanism documented, predictable and transparent? – Is this mechanism available and accessible to all stakeholders? – Is the mechanism available to stakeholders from before the start of the intervention? – Is the mechanism right-compatible? – Is the ownership and trust of the mechanism evident? – Is the mechanism regularly reviewed and adapted? 	STRONG	<p>There is a mechanism of direct contact (hotline) to Anglo American by telephone, in which the response is guaranteed within six days. This mechanism precedes the intervention, operates for 24 hours, is accessible to all stakeholders, and very well-known among the local community. People do know about it, having participated in its development, and are engaged in its adaptive management. Adherence to the measures is voluntary, thus the landowners have the autonomy to close down their activities whenever they wish.</p>	<p>Anglo American reports on the coexistence committee, which represents a formal consultative dialogue for information sharing, conflict prevention and participative construction of solutions related to the impacts generated by the installation and operation of mining.</p> <p>Social Way Policy audit reports</p> <p>Field visit and meetings</p>	<p>There is an active communication channel with the community called “Coexistence committees”, managed by the regional public environmental organizations Codema and Supram. All environmental issues are discussed within this committee, including the intervention.</p> <p>This committee precedes the intervention. It may be a good place to enhance the communication within the community about the intervention, since some people talk directly to Anglo American, but others prefer to go to public spaces first.</p>

Indicator 5.2 Participation is based on mutual respect and equality, regardless of gender, age or social status, and upholds the right of Indigenous Peoples to FPIC

Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<p>Are indigenous peoples impacted, either directly or indirectly, at any point during the intervention? Does the intervention uphold the right of Indigenous Peoples to FPIC throughout the intervention timescale? Is participation based on mutual respect and equality? Are there processes in place to support this throughout the intervention timescale?</p>	ADEQUATE	<p>Most groups interested in the interventions were involved (e.g. men and women of all ages from the communities, the municipality and NGOs eventually). There are actions to guarantee their participation such as environmental education activities (distribution of publications, informative lectures, social events). However, this participation needs to be monitored and FPIC considerations were not known.</p>	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, mentioned in section 7.8.4 on acceptance by owners</p> <p>Field visit and meeting</p>	<p>To implement the proposed activities, it was necessary to establish a term of agreement between the parties, signed by the owners. For the indicator to be fully met, it is suggested that the FPIC criteria be applied.</p>

Indicator 5.3 Stakeholders who are directly and indirectly affected by the NbS have been identified and involved in all processes of the NbS intervention				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are the stakeholders who are directly and indirectly affected by the NbS identified? – Is their impact and interest in the intervention mapped? – Are they involved in all processes of the intervention? – Do affected stakeholder accept and feel ownership over the outcomes of the intervention? 	ADEQUATE	The stakeholder analysis was made since the beginning of the intervention planning. All the affected stakeholders were involved in all the steps of the NbS design and implementation, and were trained along the process to integrate the outcomes from the intervention.	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, section 7.1 on social and environmental diagnoses.</p> <p>Field visit and meeting</p>	The project took into account the premises of social engagement adopted by the company. The implementation of a multi-scale and multi-sector analysis to strengthen the results is suggested.
Indicator 5.4 Decision-making processes document and respond to rights and interests of all participating and affected stakeholders				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are decision-making processes being documented? – Is this documentation transparent and accessible? – Do they respond to the rights and interests of all participating and affected stakeholders? – Is specific attention paid to stakeholders subject to extreme inequity? 	STRONG	The intervention project had seven interactions with affected communities, through interviews, site visits, training, communication material on the actions and environmental themes. All these procedures are documented in the Anglo American report on the spring protection actions, which is available in the company's website.	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Educational booklets produced for landowners.</p> <p>Field visit and meeting</p>	None
Indicator 5.5 Where the scale of the NbS extends beyond jurisdictional boundaries, mechanisms are established to enable joint decision-making among the stakeholders in those jurisdictions affected by the NbS				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Do ecological processes and functions of the ecosystems in the intervention extend beyond jurisdictional boundaries? – If so, is joint decision-making being enabled among the stakeholders affected by the NbS in all jurisdictions? – Are transboundary cooperation's agreements created between affected stakeholders in all jurisdictions? 	STRONG	The cooperation with the municipality is the main agreement held beyond the intervention's jurisdiction. This is the connection to the city's water supply down the watershed. The water quality assessment will be performed by Anglo American in the watershed downstream the Minas-Rio mine, because of national and state law requirements.	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Anglo American maintains in Minas-Rio system mine area and the surrounding region the Water Resources Management Programme, with different water management actions.</p> <p>Field visit and meeting</p>	None

CRITERION 6 – NbS equitably balances trade-offs between achievement of its primary goal(s) and the continued provision of multiple benefits

Indicator 6.1 The potential costs and benefits of associated trade-offs of the NbS intervention are explicitly acknowledged and inform safeguards and any appropriate corrective actions				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are costs and benefits both at the NbS site and the larger landscape/ seascape, throughout the NbS intervention time-scale identified? – Are the potential NbS costs and benefits of associated trade-offs explicitly acknowledged? – Are they used to inform safeguards? Are they used to inform corrective actions if those safeguards are passed? – Is the process of decision-making regarding costs and benefits disclosed to affected stakeholders? 	INSUFFICIENT	<p>A number of costs and benefits were implicitly accounted for during the planning and implementation, as well as some anticipated corrective actions for possible negative effects or future problems (e.g. lack of resource allocation for actions' monitoring, additional cost/risks incurred when land owner/user removes the dam, etc.). However, we did not detect a full cost-benefit analysis, or clear safeguards or explicit corrective actions covering all potential problems.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, Conceição do Mato Dentro – MG</p> <p>Field visit and meetings</p>	<p>Examples of corrective measures implicitly incorporated in the intervention are: the water troughs – as an answer to the impossibility of cattle watering after fencing the spring, the suggestions of planting orchard trees around the spring – which was not accepted by any landowner. Some prevention measures were taken by Anglo to avoid future problems and landowners' attitudes that could jeopardise the interventions (e.g. agree with them that the actions would be held in their lands, wait for the dry season to build small dams to avoid soil erosion). Many of these information are not in Anglo American reports, or are not explicitly connected. A recommendation to improve this indicator is to connect this information and make them explicit in documents. This should help in identifying what other data should be collected to fulfill the cost-benefit analysis.</p>
Indicator 6.2 The rights, usage of and access to land and resources, along with the responsibilities of different stakeholders are acknowledged and respected				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are the rights, usage of and access to land and resources as well as stakeholder responsibilities identified? – Are they incorporated into a stakeholder mapping analysis? – Are they acknowledged and respected? – Do they inform the design of the intervention? 	STRONG	<p>The interventions were designed and implemented based on many discussions and formal agreements with the community as a whole and with each landowner involved in the intervention implementation.</p>	<p>Anglo American reports on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Field visit and meetings</p>	<p>None</p>

Indicator 6.3		Established safeguards are periodically reviewed to ensure that mutually-agreed trade-offs limits are respected and do not destabilise the entire NbS		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are there mutually agreed upon limits of trade-offs and are they being respected? – Are there established safeguards in place to prevent these being exceeded or to prevent trade-offs destabilising the entire ecosystem or land/seascape? – Are these safeguards being periodically reviewed? – Is clear documentation of safeguards and their review provided? 	INSUFFICIENT	There is no evidence of documented clear trade-offs, or established safeguards and consultation around necessary safeguards. Moreover, there is no periodic review of trade-offs or safeguards.	<p>Anglo American report on Conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Field visit and meetings</p>	For this intervention, it was agreed that the landowners are responsible for maintaining the structures installed (those resulting from the interventions themselves and also the assessment devices). Although it may be hard for Anglo American to constantly monitor this maintenance, returning to the properties and checking out what happened in each of them could help in establishing safeguards and in redefining clear trade-offs.

CRITERION 7 – NbS are managed adaptively, based on evidence

Indicator 7.1		A NbS strategy is established and used as a basis for regular monitoring and evaluation of the intervention		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is there a strategy for the intervention for how societal challenges will be addressed? – Does the strategy precisely state intended outcomes, actions and assumptions in regards to economic, social and ecological conditions? – Does the strategy elaborate on whether and how assumptions may change? – Is it consistently being used as a basis for regular monitoring and evaluation of the intervention? 	PARTIAL	There is no strategy per se, but the expected outcomes are clear in the Anglo American report. Nonetheless, a complete monitoring or evaluation after implementation is not provided, and possible changes to adapt the intervention are not accounted for.	<p>Anglo American reports on Conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Field visit and meetings</p>	<p>Bring all the pieces together into a spring restoration strategy document.</p> <p>At the planning and implementation stages, there was an intense dialogue between Anglo American and the local community, including an “adaptive management” according to the feedback obtained throughout these stages. This same approach could be used in monitoring outcomes, taking advantage of the relationship developed between company and community. Moreover, we highlight there was a formal agreement that the landowners would be responsible for the maintenance of the intervention’s structures. This shows the company had a concern about monitoring. If Anglo American could start a more punctual monitoring of structures maintenance, the score of the indicator could improve.</p>

Indicator 7.2		A monitoring and evaluation plan is developed and implemented throughout the intervention lifecycle		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is there a robust monitoring and evaluation plan in place? – Is it being implemented throughout the lifecycle of the intervention? – Does this plan include how deviations of the strategy trigger an adaptive management response? 	INSUFFICIENT	<p>Even though community members were trained to perform some monitoring actions and to maintain the structures, these actions should be monitored by Anglo American, which has not yet happened. There is no specific monitoring plan and no adaptive management response contemplated. There are monitoring plans to measure water quality and quantity downstream – required by law – but this cannot be directly connected to the spring intervention.</p>	<p>Anglo American reports on Conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Water Monitoring Programme</p>	<p>An example of monitoring issues: there was going to be four flow-monitoring points, but the community asked for it to be only one. Anglo American could try to reinvest in these monitoring points. Simple measures could result in good data to estimate the direct effects of the intervention. This could improve the indicator's classification in time. Furthermore, Anglo American highlights the intervention areas are outside their property, so they are not covered by their regular monitoring programmes. Consequently, they recommended the NbS Standard could somehow make a distinction when the intervention occurs inside the company's property from when it occurs in third parties' properties.</p>
Indicator 7.3		A framework for iterative learning that enables adaptive management is applied throughout the intervention lifecycle		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Is there a plan to learn and adapt in response to the monitoring and evaluation plan? – Is there a learning framework applied to the NbS for iterative learning throughout the intervention lifecycle? – Does this enable adaptive management? – Is there are strategy for how learning persists beyond the time frame of the intervention? 	INSUFFICIENT	<p>The monitoring throughout its lifecycle is incomplete or inexistent, which makes it harder to have a learning framework (and which, in part would derive from the monitoring).</p> <p>Even though the intervention was recently implemented, the following period of time may bring important lessons about its functioning and, consequently, on how it could be improved to reach the desired outcomes.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Field visit and meetings</p>	<p>At Anglo American, the culture of assessing lessons learned and then adapting their actions has been established in recent years; it occurs throughout the projects, especially when there is an expansion of the company's activities. Currently, a municipal basin small-committee (micro basins of the municipality) covering almost the entire Rio Santo Antônio Basin is being formed. The committee includes all civil society interested in the issue. Anglo American was also invited to participate. This committee will be a great opportunity to connect projectshappening in the region, and thus avoid duplicating work. It will also involve a discussion of lessons learned in the region.</p>

CRITERION 8 – NbS are mainstreamed beyond standalone, time-bound interventions

Indicator 8.1 NbS design, implementation and lessons learnt are shared for triggering transformative change				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are NbS design, implementation and lessons learnt being systematically captured? – Are they being shared both on demand and with strategic audiences? – Is this sharing accessible to target audiences? – Is a communication strategy in place? – Does this strategy detail how communication will change behaviours and how this will trigger transformational change? 	PARTIAL	<p>Communication and environmental education strategies (on-site and community level trainings; Science Museum) are in place. Nonetheless, there is no systematic capture of lessons learned from the intervention, so there is no information sharing with interested audiences. It is also not clear if the local community has full access to all the intervention's outcomes present in the Anglo American report on the spring protection actions.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Environmental Education Programme (PEA) is developed with the communities located in the vicinity of Minas-Rio and with employees and contractors working at the Anglo American undertaking.</p> <p>Interventions, based on the Participatory Participative Socio-environmental Diagnosis (PSD)</p> <p>Field visit and meeting</p>	<p>Promote engagement and communication with the landowners/ users into the Anglo American communication and educational strategy.</p> <p>Share lessons learnt within the Initiative for Responsible Mining Assurance (IRMA) and other strategic networks and audiences, so the intervention can be scaled to other operations and contexts.</p> <p>Environmental education, for example, is based on 'participative diagnostics'. Communities are consulted about their demands. Topics in educational actions are always close to their needs. Incorporating this intervention in Anglo American's strategy is a challenge and an opportunity.</p>
Indicator 8.2 NbS inform and enhance facilitating policy and regulation frameworks to support its uptake and mainstreaming				
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> – Are policy, regulations and laws relevant to the intervention being identified? – Are their impacts and opportunities being mapped? – Are early adopters and entry points being identified? – Are the interventions actions and communications informing or enhancing facilitating policy and regulation frameworks? – Is this supporting uptake and mainstreaming of NbS? 	STRONG	<p>The spring protection is in compliance with the buffer zone and property size required by the law, as well as in accordance with the characteristics and the importance for biodiversity of the upper catchment and downstream. The project also aimed to create educational publications to encourage small landowners to follow the legal requirements such as rural environmental certificate. Moreover, a cooperation with the Instituto Espinhaço allowed for civil society collaboration in the region.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i></p> <p>Field visit and meeting</p>	<p>An option to mainstream the spring protection intervention would be to extend these actions to Anglo American's sites in Chile, Namibia, etc. This could also be relevant for Anglo American's Sustainable MiningPlan.</p>



Indicator 8.3		Where relevant, NbS contribute to national and global targets for human well-being, climate change, biodiversity and human rights, including the UNDRIP)		
Guiding questions	Score	Rationale	Means of verification	Recommendations, opportunities and challenges
<ul style="list-style-type: none"> — Are relevant national and global targets for human well-being, climate change, and biodiversity and human rights being identified? — Does this include UNDRIP? — Are the interventions actions contributing to any of these targets? — Is this contribution being reported in relevant platforms? — Is this facilitating mainstreaming and upscaling of the intervention? 	<p>ADEQUATE</p>	<p>National targets have been identified, mostly because of federal law, as well as global targets. UNDRIP has not been included. The intervention is contributing to all these targets (although effective monitoring is lacking and despite the fact the contributions were not explicitly reported). The actions' disclosure so far has clearly facilitated its mainstreaming.</p>	<p>Anglo American report on conservation actions in the springs of the Santo Antônio River, <i>Conceição do Mato Dentro – MG</i>, especially section 2 on context and section 3 on justification.</p> <p>Online platform of the Brazilian Business Council for Sustainable Development (CEBDS) that gathers and monitors actions and targets of the private sector for issues related to biodiversity conservation: https://cebds.org/ibnbio/projeto/acoes-em-regioes-de-atuacao/</p>	<p>The intervention is conceived in accordance with the United Nations Global Compact and SDGs. This could be easily explained in Anglo American reports. We recommend to do so. Moreover, it is also in accordance with the CEBDS commitments.</p>



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