



Global Cement and Concrete
Association

GCCA Sustainability Guidelines for Quarry Rehabilitation and Biodiversity Management

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Global Cement and Concrete
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Executive Summary

The first step in cement production, as well as in aggregates production – the extraction of raw materials from the earth's crust – inevitably has an impact on the surrounding natural and social environment. However, these impacts can be successfully addressed and mitigated through the development and implementation of an effective, well-designed and progressive quarry rehabilitation/restoration plan that is linked to the mining plan of the site, and which can contribute to bringing significant environmental and social benefits to the environment around operations.

Even though creating new habitats through rehabilitation and mitigation is common practice for operators in the cement sector, many companies are now realising that it is important to manage biodiversity as part of responsible and proactive risk management, under the broader scope of the natural environment, and land stewardship. Companies that demonstrate responsible business behaviour, by minimising their ecological footprint, and ensuring the preservation of the natural capital as well as the welfare of communities in their areas of operation, can have a competitive advantage, develop company value and achieve better long-term sustainability of their operations.

The Global Cement and Concrete Association (GCCA) is committed to supporting all its members and the sector to minimise impacts and where possible enhance biodiversity, by providing the guidelines, standards and best practices available for quarry rehabilitation and biodiversity management.

These guidelines and appendix, which contains supporting graphs and tables, aim to provide GCCA members with practical guidance for the design and progressive implementation of rehabilitation practices and biodiversity management, by presenting the key issues, explaining the connection between operations and healthy ecosystems, outlining management approaches, and linking to reference documents, data, tools and guidance. The guidelines also provide the basis for member companies to report on their performance in a standardised manner, with reference to the global target of stopping the loss of biodiversity, and further restoring and enhancing the value of natural ecosystems.

Likewise, GCCA members are committed to setting targets, as well as measuring and reporting to the GCCA based on the KPIs for biodiversity management and quarry rehabilitation that are defined in these guidelines, in order to drive continuous performance improvement, benchmark company performance and to meet their obligations under the GCCA Sustainability Charter. The GCCA publishes aggregated results considering legal constraints and confidentiality limitations. The scope of the guidelines and KPIs covers quarries for both cement and aggregates production, without any differentiation for the scope of application, and the KPIs. On the global environment: The GCCA will maintain its awareness and observe global trends in the areas of biodiversity, ecosystems and species conservation. The work of the Convention on Biological Diversity, also the UNEP, IUCN, WWF, Birdlife International, the Capitals Coalition (including both the Natural Capital Coalition and the Social & Human Capital Coalition) and other worldwide coalitions and collaborative initiatives, is meaningful for the members of the GCCA.

1. Introduction

1.1 The Global Cement and Concrete Association

The Global Cement and Concrete Association (GCCA) is the global voice of the cement and concrete sector. One of the objectives is to develop and strengthen the sectors contribution to sustainable construction across the value chain. The GCCA aims to foster innovation throughout the construction value chain in collaboration with industry associations as well as architects, engineers, developers, contractors and innovators. In this way, the association demonstrates how concrete solutions can meet global construction challenges and sustainable development goals while showcasing responsible industrial leadership in the manufacture and use of cement and concrete. The GCCA was established in January 2018 and is headquartered in London.

1.2 GCCA Sustainability Charter

These Guidelines for quarry rehabilitation and biodiversity management are part of a package of guidelines developed to support compliance with the GCCA Sustainability Charter. The GCCA Sustainability Charter has identified five key pillars, which encompass the sustainability spectrum of the cement and concrete sector, and has set out requirements for full members against each of these:

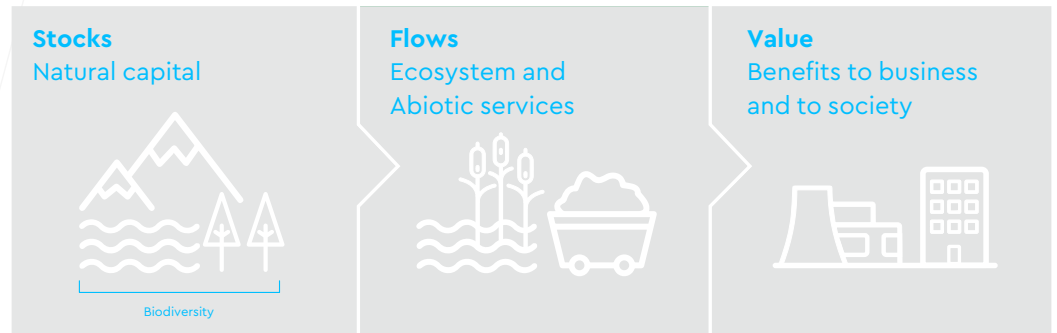
1. Health & Safety.
2. Climate Change & Energy.
3. Social Responsibility.
4. Environment & Nature.
5. Circular Economy.

In applying these guidelines, GCCA full members must implement the general requirements of the GCCA Sustainability Framework Guidelines.

1.3 Background

Natural Capital is a way of describing our relationship with nature, in order to measure and assess the role that it has and can be included in decision-making. Natural capital underpins our societies, economies, institutions and regulates the environmental conditions that enable human life. It is not an interchangeable economic asset in the same way as it happens with financial capital.

The Natural Capital is constituted by the stock of renewable and non-renewable natural resources (e.g. plants, animals, air, water, soil, minerals) which, when combined, confer the character to the different ecosystems, generating a flow of benefits for people, companies and society commonly known as ecosystem services. These services have been classified into four categories: provisioning, regulation, culture and support. Wood, fiber, pollination, water regulation, climate regulation, recreation and mental health are some of the services provided by ecosystem, among which are also abiotic services, represented by the benefits derived from the fundamental geological processes (e.g. the supply of minerals, metals, oil and gas, geothermal heat, wind, tides and the annual seasons).



The health and stability of natural capital is provided by biodiversity and offers resistance to shocks such as floods and droughts, supports fundamental processes such as carbon cycles, water and soil formation. Biodiversity is a constituent of natural capital and the basis of ecosystem services.

The cement and aggregates industries both depend and have an impact upon biodiversity and ecosystem services. The first step in cement and aggregates production – the extraction of raw materials from the earth’s crust – inevitably has an impact on the surrounding natural and social environment. In particular, the removal of soil and changes in topography of the area are likely to affect local ecosystems and watersheds. Minimizing environmental impact is therefore a fundamental requirement for the sustainable operation in the cement sector. Impacts can be successfully addressed and mitigated through the development and implementation of an effective quarry rehabilitation plan and a Biodiversity Management Plan, especially in areas of high biodiversity.

In some cases, the effective implementation of a well-designed rehabilitation plan can result in significant environmental and social benefits. Even though re-creating the pre-existing habitats or creating new ones through rehabilitation is common practice for operators in the cement sector, many companies are now realizing that it is important to manage biodiversity as part of responsible and proactive risk management, leveraging value and contributing to society.

Companies that demonstrate responsible business behavior by minimizing their ecological footprint and ensuring the welfare of the communities and environments in their areas of operation automatically have a competitive sustainability leadership: they are more likely to avoid operational risks, to attract investors, to gain public and consumer support, and to retain high-value employees, for example.

1.4 Relation to other documents

This document, in conjunction with the ‘GCCA Sustainability Framework Guidelines’ provides guidance to GCCA full members to fulfil the requirements of the GCCA Sustainability Charter relating to biodiversity. It is partially based on and supersedes the WBCSD-CSI documents ‘Guidelines on Quarry Rehabilitation, December 2011’ and ‘Biodiversity Management Plan (BMP) Guidance, September 2014’.

2. Relevance

Successful quarry rehabilitation and biodiversity management plans bring benefits for operating companies. The license to operate for both the industry and for individual companies is dependent on ensuring that land used for quarrying purposes is rehabilitated in an effective and responsible manner, considering the socio-economic and environmental factors, legal requirements, and the needs and expectations of stakeholders. Companies that adopt the best practice in this regard can expect significant benefits, including competitive advantage and long-term sustainability of their operations.

The aim of this document is to provide practical guidance to all companies, by presenting the key issues, explaining the connection between operations and healthy ecosystems, outlining management approaches, and then linking to reference documents, data, tools and guidance, so that companies can progressively implement rehabilitation practices and biodiversity into site-level management, through the development of appropriately focused rehabilitation and management plans. By addressing this objective and encouraging the measurement and monitoring of clearly stated biodiversity targets, this document aims to support the overall objective to minimize impacts and, where possible, to enhance biodiversity.

3. Objectives

The Guidelines contain a clear set of recommendations for the development and implementation of a quarry rehabilitation plan or a biodiversity management plan, with the following objectives:

- Support the process of quarry rehabilitation and biodiversity management across member companies, and by doing so, improve the standard of applied practices for existing and new sites.
- Ensure common understanding and consistent reporting of GCCA KPIs on biodiversity and quarry rehabilitation.

This document provides guidance to GCCA full members in order to fulfil the requirements of the GCCA Sustainability Charter relating to biodiversity, which falls under the pillar of Environment & Nature. However, the importance of monitoring and reporting should not be restricted to a requirement under the GCCA Sustainability Charter – it is the basis of all efforts in quarry rehabilitation and biodiversity management and supports transparent communication with stakeholders.

4. Operational Context

4.1 Scope and Principles

Scope

The guidelines are designed to be applicable to:

- **All quarry sites that are under a company's management control**, including: new quarries ("green-field" projects), active quarries, inactive quarries, and depleted/closed quarries, as defined in Chapter 7 of this document.
- **Quarries for both cement and/or aggregates production.**
- A broad range of rehabilitation processes and methods/techniques.
- A variety of land end uses including, agriculture, forestry, natural reserves, commercial and residential development and recreational facilities.
- Rehabilitation and biodiversity management in a broad range of environments, climates and geographies.

The objective of rehabilitation plans is to leave the site safe and stable for future use of the land, and which may or may not be related to the values of biodiversity. A Biodiversity Management Plan (BMP) is a risk management tool which covers the whole life of a quarry. It is a site-specific document that focuses on identifying, evaluating and conserving/enhancing all relevant aspects of biodiversity as well as prioritize values of biodiversity and other forms of land use that do not endanger the conservation of biodiversity. Given the dynamic nature of biodiversity, a BMP should be considered a living document, and reviewed and updated periodically.

A BMP and a Quarry Rehabilitation Plan (QRP) are complementary and should dovetail with each other because the same biodiversity components will require appropriate focus. The requirement for a BMP depends on the sensitivity of the site with regards to biodiversity, whereas best practice is to have a QRP regardless of the biodiversity value at a site. Some sites will require a standard rehabilitation plan, but sites richer in biodiversity will require a comprehensive BMP (see *Appendix – Fig. 1*).

ESIA, QRP and BMP are elements of the environmental management plan (EMP) of the site. The link between them and their purpose are presented in *Fig. 2 of the Appendix*.

Key Principles for Quarry Rehabilitation Plans (QRPs) and Biodiversity Management Plans (BMPs)

The following elements, which are further elaborated in the next sections of the guidelines, consist the key principles for a QRP and a BMP:

- The **post-closure land use** needs to be clearly assessed when initiating a QRP, even if this can evolve over the lifetime of the quarry. The QRP/BMP are based on a clear set of objectives and measurable targets, reflecting the legislative requirements (as the highest priority), and encompassing the local social, economic and environmental (including biodiversity) considerations for the future use of the site.
- **Legal compliance** must be the minimum requirement when establishing a QRP and/or a BMP. The guidelines should never be in conflict with legal compliance but should strive to complement and go beyond legal requirements, where this is possible.
- **Progressive rehabilitation** should be applied where possible as good practice and also depending on the specific type of rehabilitation method (could be re-forestation or re-vegetation for example, or wetland mitigation, or landscaping in a desert environment), while the local conditions and specificities of the natural environment must always be taken into account. This has the advantage of reducing open areas within the quarry, reducing potential soil erosion and increasing confidence in the rehabilitation plan among stakeholders, as well as allocating the overall rehabilitation cost with annual provisions throughout the mine life of the quarry. It also provides a timely and positive visual impact, allowing stakeholders to see and anticipate future rehabilitation outcomes. Overall, the progressive rehabilitation can deliver biodiversity benefits at an early stage, reduce net loss and increase net gain.
- **Stakeholders** are involved at all stages. The QRP/BMP should address stakeholder expectations, and be aligned with, or leverage from, the stakeholder view, experience, culture and customs. The long-term sustainability of the QRP and the BMP should be ensured through appropriate partnerships, resourcing and engagement of stakeholders.
- An assessment of the **baseline conditions** enables identification of the impacts and measurement of the changes that may arise as a result of quarrying activity.
- The **QRP/BMP** are developed along with the mining plan, prior to the commencement of extraction activities for new sites, but should also be developed for operating quarries, where such a plan does not already exist.
- A **monitoring plan** is integral part of the QRP/BMP, thereby ensuring the documentation and measurement of progress and performance against the objectives. Based on the results of the monitoring plan, appropriate corrective measures are taken where necessary, under a revision process of the QRP/BMP.

4.2 Legislative Environment

Legal compliance is the minimum requirement. The guidelines are a complement to applicable local or international legislation and must not be used as a substitute or resulting in conflicts with legal compliance. It is however recommended that companies continue to incorporate the best practices of biodiversity management and quarry rehabilitation in the search for better global standards instead of just meeting the legal requirements.

4.3 Stakeholders Engagement

Stakeholders are people or institutions that feel they may be affected by, or may affect, an organization's activity. Stakeholders can be either internal to the organization (e.g. employees, shareholders) or external (e.g. land owners, local communities, authorities, NGOs).

Effective stakeholder commitment in QRP and/or BMP generates benefits for the interested parties as well as for the company. Companies should open a constructive and long-term dialogue, promote the exchange of knowledge and understanding and thus enhance trust among all parties. The development of activities of a QRP/BMP based on previous consent of the objectives of these plans, including local social aspects, has increased chances for success. On the contrary, failure to identify and consult appropriate stakeholders may result in less credible rehabilitation plans and biodiversity management strategies, with negative impacts associated with the perception of mining activities and the operating company.

Stakeholder engagement should be an ongoing process, and not a one-off exercise conducted in the early stage of the rehabilitation project. It is important to recognize that constructive relationships take a long time to develop and are based on the trust that develops through listening to stakeholders and addressing concerns, engaging in regular communication and delivering on promises over a sustained period. Accordingly, companies should be prepared to commit both time and resources to this process.

4.4 Mitigation Hierarchy

The mitigation hierarchy provides the cornerstone for shaping a structured biodiversity management approach, in an effort to avoid unacceptable impacts, minimize any impacts that may occur and finally mitigate for any residual impacts to the local biodiversity through rehabilitation, compensation projects or offsets (Fig. 3; Fig. 4). The mitigation hierarchy assists a development project to work towards no net loss, and in the best case, a net gain in biodiversity. It helps to frame impacts and allows the setting of targets in a way that promotes good practice and ensures optimal biodiversity protection within an operational context.

For the cement sector, rehabilitation may have different purposes and objectives, but in some cases can contribute significantly to the enhancement of biodiversity thereby mitigating any residual impact. Where gains are minimal, residual impacts can be mitigated either through offsets or through compensation measures.

Offsets are measures taken explicitly to achieve No Net Loss and preferably a Net Gain, and are measurable conservation outputs designed to compensate for significant residual impacts. The requirements for offsets are set out in specific country laws and policies, are economic instruments and are based on the polluter pays principle. In contrast, compensation involves measures to recompense, enhance or pay damages for the loss of biodiversity, and may fall short of no net loss¹.

To understand how a particular quarry is progressing towards achieving either no net loss/net gain, and whether rehabilitation alone is sufficient, or offsets/compensation measure may be required, there is a need to clearly understand the baseline situation prior to extraction activities. For more information on how to actually assess biodiversity impact, see Chapter 5 (Net Impact Assessment methodology).

4.5 Defining the context of the quarries rehabilitation and biodiversity management plans

The rehabilitation plan is based on a series of objectives that reflect the legal requirements (as a priority) and that include, in the future use of the site, social, economic and environmental considerations, including those related to biodiversity and natural capital. The rehabilitation plan as a principle, must guarantee that the site is left in safe and stable conditions. An appropriate adaptation of the land is also a guarantee for the success of the revegetation activities, with which it is possible to recover the ecosystem functionality.

The BMP can be integrated to the strategies developed within the QRP framework and improve the integral management of the site. A BMP should focus on the biodiversity characteristics which are relevant and/or unique to the site and which were identified through a ESIA or a specific study. The adaptation of the BMP according to the results obtained from the implementation and monitoring of the relevant actions can ensure sustainability in the long term. Additionally, the implementation of BMPs and occasionally QRPs can generate diverse social opportunities and promote sustainable socioeconomic activities, such as the development of micro-businesses based on biodiversity.

¹ <https://www.forest-trends.org/bbop/bbop-key-concepts/mitigation-hierarchy/>

4.6 Setting objectives for the quarries rehabilitation and biodiversity management plans

The final objectives for a QRP and a BMP should be identified, briefly stated and communicated. The objectives will help to guide the development of the plans and can be used by internal and external stakeholders to evaluate the success of the rehabilitation actions and the biodiversity management measures. To the extent that each project needs to be adapted to local circumstances that are specific, and in some cases unique, the objectives may vary significantly.

In the case of QRPs, the objectives should be constructed with the purpose of: reflecting compliance with the legal requirements determined for the site; promoting the sustainable use of land after closure; mitigating the impacts identified in the ESIA; maximizing social and environmental benefits to local communities; considering the needs of the stakeholders both internal and external; re-integrating the quarry areas to the ecological conditions of the site; and generating opportunities to rehabilitate, restore and enhance biodiversity.

To maintain or improve biodiversity values and ecosystem services on the site (i.e. to achieve a positive net impact) the objectives of a BMP can be grouped as follows:

- Objectives for priority ecosystems (e.g. maintain or increase the coverage area, restore and improve the condition of abandoned or degraded ecosystems)
- Objectives for priority species (e.g. improve the range compared to the reference year; maintain or improve the population size, in relation to the reference year or at start of monitoring).
- Objectives for processes & flux (e.g. maintain current variety of species within an ecosystem and avoid imposing anthropogenic management on naturally random patterns).
- Objectives for ecosystem services (e.g. restore services of new or existing ecosystems).

4.7 Establishing the basis for the rehabilitation and biodiversity management plans

The establishment of rehabilitation plans and BMP can share the same baseline information, including:

- **Identification of data relevant of the site:** The first source with which relevant information is obtained is through an environmental and social impact assessment (ESIA). The ESIA is an essential precursor to any operations and provides among others a baseline assessment, as well as the expected impacts on biodiversity. This information is the basis and sets the framework for the development of a QRP or a BMP and identifies the risks for biodiversity, whose management strategy should start with the application of the mitigation hierarchy. Another complementary tool is the Integrated Biodiversity Assessment Tool (IBAT)², which can provide a useful basis for filtering or conducting a first analysis of the site's biodiversity sensitivity, although additional information is required to conduct a comprehensive biodiversity assessment of the site. Another support tool is the UN Biodiversity Lab³, which provides spatial information available to make informed conservation decisions.
- **Field study:** Following the biodiversity desktop study it is important to undertake a field study, including surrounding areas that may feature similar ecological characteristics with the project area, in order to obtain better understanding of the territory, ecosystems, potential risks and opportunities for the design of strategies for rehabilitation and management of biodiversity.

4.8 Design and implementation of the rehabilitation and biodiversity management plans

Once objectives are set, the rehabilitation plan can be established in alignment with the mining plan. The plan should illustrate what the site will look like during the different phases of the site development, as well as post-closure, and how the company intends to restore the site to meet the agreed objectives, by applying – where possible – progressive rehabilitation throughout the mine life of the quarry.

Framework for designing and implementing a QRP

While the contents of a rehabilitation plan for any given site vary according to local conditions, the following base elements should be considered for the **design of a QRP**:

- **Context:**
In line with the ESIA, the rehabilitation plan must establish details of the physical, natural, economic and social environment.
- **Objectives:**
Clear description and detail of their scope, including the post-closure land use(s) and the final land form.
- **Action plan:**
Determination of the actions to reach the objectives. It should relate responsible, necessary resources and the delivery deadline, including milestones to facilitate monitoring and measuring progress towards final objectives.

Technical and environmental parameters:

- Slope stability and other health & safety concerns.
- Biodiversity conservation & ecosystem services.
- Soil conditions & management.
- Habitats & vegetation.
- Hydrology & hydrogeology.

² <https://www.ibat-alliance.org/>

³ <https://www.unbiodiversitylab.org/>

- **Stakeholder engagement plan:**
Seeking opinion and disclosure of rehabilitation activities throughout the quarry lifetime.
- **Schedule and prioritization of actions:**
Details of the timing and sequencing of the rehabilitation program, in line with the mining plan. When changes occur in the mining plan, rehabilitation activities must be adjusted accordingly.
- **Monitoring and evaluation:**
The plan should detail the KPI monitoring programs that will be applied to evaluate if the rehabilitation plan meets the proposed objectives.
- **Rehabilitation costs:**
The plan should contain details of the expected costs of both the rehabilitation activities and the ongoing monitoring and management of the site, post-rehabilitation. The QRP should also identify where ownership of the rehabilitation costs lies within the organization.
- **Responsibilities:**
The overall responsibilities for the rehabilitation plan and the individual actions should be identified and appropriately resourced.

While specific techniques and practices employed are dependent on the objectives of the rehabilitation plan and on the characteristics of the individual site, the **implementation of the QRP** needs to follow some general principles, including:

- **Safety:**
Health and safety should always be the first concern; upon site closure the infrastructure and equipment should be removed, any waste disposed of appropriately, and benches and slopes formed appropriately.
- **Resources:**
Adequate resources (financial and human resources) should be allocated to ensure effective implementation of the rehabilitation plan.
- **Progressive rehabilitation:**
Progressive rehabilitation should be carried out whenever parts/areas of the quarry are being depleted and depending on the specific type of rehabilitation method (could be re-forestation or re-vegetation for example, or wetland mitigation, or landscaping in a desert environment), while the local conditions and specificities of the natural environment must always be taken into account.
- **Review:**
The progress of rehabilitation should be reviewed on a regular basis.
- **Stakeholders' engagement:**
The expertise, resources and skills of relevant stakeholders should be taken on board wherever possible to help implement the QRP.

All modifications to the QRP must be clearly communicated to all interested parties and to ensure that adequate funds are available. The associated costs should be identified and included in the financial plan for the operation of the quarry and to be updated throughout the life cycle of the project.

Framework for designing and implementing a BMP:

In the design of a BMP, it is recommended to work with expert partners to help define the appropriate targets and actions. The stages in the development of a BMP are summarized as follows:

- **Stage 1:**
Investigation of existing background data and context. This can be a desktop exercise or may require the engagement of a consultant to compile information relevant to the location.
- **Stage 2:**
Field investigations (habitat types, target species) to establish a biodiversity baseline.
- **Stage 3:**
Stakeholder engagement plan.
- **Stage 4:**
 - a.) Determination of priority species and habitats, ecosystems, based on field investigations and stakeholder consultation.
 - b.) Definition of biodiversity targets and related actions.
 - c.) Development of monitoring program to assess progress and management effectiveness.
- **Stage 5:**
Production of a BMP for the site, approved by management. There is no standard template for a BMP because the issues it needs to address relate with the location, the biodiversity values at the site, and the nature of the company operations. An example for a BMP structure is given next.

Example BMP Document Structure

- 1. Summary**
- 2. Methodology**
- 3. Biodiversity Context**
 - a) Basic information
 - d) Description extraction site
- 4. Prioritise biodiversity features and components of elevated significance**
- 5. Objectives and targets**
 - a) Develop objectives taking into account the previous valuation
 - b) Develop the objectives into actions, taking the mitigation hierarchy into account
- 6. Actions (management)**
 - a) Actions based on legal requirements
 - b) Biodiversity actions
- 7. Implementation**
 - a) Identify appropriate implementation mechanism for the BMP
 - b) Involve stakeholders and partners
- 8. Monitoring and surveillance**

Example BMP Document Structure continued...

9. Budgets and timelines

10. Reporting

- a) Internal and external reporting

11. References

12. Appendix

- a) Maps
- b) Photo documentation

More details, see: wbcasd. 2014

- **Stage 6:**

Review, adaptation of actions, communication and reporting. Evaluation and adaptation are essential parts of good management practices, allowing reflection on the effectiveness of the plan as a management tool.

The implementation of the BMP will be subject to the conditions of biodiversity and natural capital evaluated, the priorities established, the financial resources available and the joint commitment of the company, stakeholders and the support from external partners.

5. Net Impact Assessment (NIA)

A net impact approach is a way to identify, measure, value, compare and set targets in relation to environmental, social and/or economic impacts, both positive and negative, that a project has over a period of time. Biodiversity assessment enables extractive companies to measure both their positive and negative impacts and thus progress towards achieving net neutral/no net loss and even net positive impact. It is therefore possible, at some sites, to avoid and reduce negative impacts and to increase positive impacts on biodiversity, so that at least no net loss or ideally an overall net positive impact is achieved.

The WBCSD-CSI document '*Methodology for the Net Impact Assessment (NIA) of Biodiversity in the Cement Sector, 2018*' proposes a methodology for companies to measure the impacts on biodiversity, both positive and negative, in a consistent manner using a standardized approach, in order to develop appropriate management actions. According to this methodology, to assess the net impact of a quarry site it is necessary to determine and compare biodiversity values at a certain moment in time (during or post-quarrying/operation) against a baseline, which should be the pre-quarrying/operation status (the status before any operation had started). In principle, the methodology is based on habitat assessment, also using species-related criteria, and compares:

- the coverage area;
- the importance; and
- the quality/condition

Of each habitat at pre – and post – (or during) quarrying/operation moments.

The methodology is not intended to replace wider existing systems and planned work on biodiversity, though it may in some cases complement them or be complemented by them. For example, a rehabilitation plan can be informed by NIA methodology and steered towards a biodiversity-focused end-use and an ESIA can help inform a baseline from which to define appropriate metrics for the NIA (see *Appendix – Fig. 5*).

6. Key Performance Indicators

The GCCA is aware of the need to track the progress of improvements and to communicate this progress to all stakeholders. These guidelines therefore include a number of simple, reliable and representative KPIs.

All definitions of the terms used in the KPIs are provided in Chapter 7. Glossary and Definitions.

KPI 1:

Percentage (%) of quarries with high biodiversity value where biodiversity management plan is implemented.

Example for calculation of KPI 1

A company has 50 quarries under its management control, some of those producing aggregates. Based on a process for determining the biodiversity value at all quarry sites, the company identified that 10 quarry sites are of high biodiversity value. The company has developed and implements a Biodiversity Management Plan (BMP), in line with the respective Guidelines, at 6 of those quarries. So, the KPI is calculated as follows:

$$KPI = 6/10 \times 100 = 60\%$$

KPI 2:

Percentage (%) of quarries where rehabilitation plan is implemented.

Example for calculation of KPI 2

A company has 50 quarries under its management control, some of those producing aggregates. The company has developed and implements a Quarry Rehabilitation Plan (QRP), in line with the respective Guidelines, at 40 of those quarries. So, the KPI is calculated as follows:

$$KPI = 40/50 \times 100 = 80\%$$

7. Glossary and Definitions

Definitions for the KPIs

The scope of all KPIs described in the Guidelines covers all quarry sites that are under a company's management control, including: active, inactive, and depleted/closed.

Quarry:

Any extraction pit/site/operation for producing raw materials **for cement and/or aggregates production**, or/and for removing of overburden in order to prepare for operations. A quarry site is a geographically contiguous area, which may contain more than one extraction areas and also the related infrastructure, like access and transportation roads, crushing and handling facilities.

Quarry sites under a company's management control:

Areas owned by a company or authorized through a lease or other contractual agreements with individuals or public entities (local, regional or national authorities) and where the company has the authorization, based on all required permits/licenses, to manage specific project development, mining, infrastructure works, a rehabilitation plan, a biodiversity/conservation plan, offset programs, etc. in any way.

Active quarry:

Having operated for at least part of the current year with a regular or planned mining schedule for the extraction of raw materials for cement and/or aggregates production or any other activities, including: stripping/removing of overburden, infrastructure works for quarry development, processing and/or sales of excavated material from stockpiles.

Inactive quarry:

Has operated in the past, has not been operating in the reporting year or for a longer period, but where management plans exist to re-initiate project activities in the future. Assuming that the implementation of the rehabilitation plan and biodiversity management plan at an inactive quarry have reached the stage that all permit/license conditions or other obligations stemming from competent authorities requirements have been fulfilled, then the quarry can be considered "out of scope" of these guidelines and can be excluded from the calculations for the relevant KPIs.

Depleted/ closed quarry:

Has stopped operations due to depletion of reserves or closed for other reasons and activities will not initiate again, but is still under a company's management control (not returned back to the respective authorities and/or land owners) for the implementation of post-closure activities, such as rehabilitation, restoration, decommissioning, etc. From the year when a depleted/closed quarry has been legally "handed over" to third parties (e.g. donation or divestment, to public sector, regional or local community, or private entities) for other land uses, and does no longer belong to the company's asset portfolio, then the quarry can be considered "out of scope" of these guidelines and can be excluded from the calculations for the relevant KPIs.

Similar with the inactive quarries (see above), in cases where the closed quarry is still kept under the company's ownership for other land uses and assuming that the rehabilitation plan and biodiversity management plan have reached the stage that all permit/license conditions or other obligations stemming from competent authorities requirements have been fulfilled, the quarry is "out of scope" of these guidelines and should be excluded from the calculations for the relevant KPIs.

High biodiversity value:

Is attributed to both Protected Areas and High Biodiversity Areas that a quarry is within or contains or is adjacent to, defined as follows:

- Protected Area: a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. (*IUCN Definition 2008*)

OR: a geographically defined area, which is designated or regulated and managed to achieve specific conservation objectives. (CBD Definition 1992)
- *High Biodiversity Area*: area not subject to legal protection but recognized for important biodiversity features by a number of governmental and non-governmental organizations. These include habitats that are a priority for conservation (often defined in National Biodiversity Strategies and Action Plans prepared under the Convention on Biological Diversity). In addition, several international conservation organizations have identified particular areas of high biodiversity value (*according to GRI*).

First level approach for identifying the biodiversity value are the legislative and regulatory requirements (on international/national/regional level) referring to: protected species and habitats, nature conservation, treatment of wildlife, water management etc.

The biodiversity value is further assessed through the process of the Environmental and Social Impact Assessment (ESIA) that is conducted for the project site and which outlines the derived responsibilities and required actions for managing impacts on biodiversity. Biodiversity value is also identified with the use of available international platforms/tools, like the Integrated Biodiversity Assessment Tool (IBAT) or others as provided in the Natural Capital Protocol Toolkit (joint development of the WBCSD and the NCC).

Adjacent:

Close enough to have an impact on the area under consideration, e.g. impact to wetlands or other water bodies. The impact is assessed through an Environmental and Social Impact Assessment (ESIA).

Biodiversity Management Plan (BMP):

A practical site-specific document developed and used by the site management team to maintain or improve biodiversity values during the operational and post-closure phases, and to determine risks and opportunities before mining begins. The process for developing a BMP should focus on identifying, evaluating, conserving (and if possible, enhancing) the relevant aspects of biodiversity. The development of a BMP follows the principles, objectives and stages, as outlined in the respective Guideline.

Quarry rehabilitation:

All planned activities that aim to turn mined/exploited land into a stable, safe state area, compatible with its natural environment and suitable for the proposed future use of the land. Rehabilitation needs to be considered and integrated at all stages of the project life cycle. Rehabilitation is referred to also as restoration or reclamation.

Rehabilitation Plan (RP):

A practical site-specific document developed and used by the site management team for organizing the rehabilitation works. The RP is aligned with the mine plan and follows the principles, objectives and stages, as outlined in the respective Guideline. Rehabilitation plan is referred to also as restoration plan or reclamation plan.

Depleted areas:

Areas at a quarry site, which have been impacted/disturbed in the past and where mining activities will no longer take place for certain reasons, like for example: depletion of reserves after the application of the mine plan; not suitable quality; other limitations that do not allow for mining (technical, economical, permitting etc.).

Rehabilitated areas:

Areas where activities have been performed according to the Rehabilitation Plan, to turn the impacted/mined/exploited land into a stable, safe state area, compatible with its natural environment and suitable for the proposed future use of the land. Rehabilitated areas are referred to also as restored areas or reclaimed areas.

Other Glossary**Baseline:**

A surveyed or predicted condition that serves as a reference point to which later surveys are coordinated or correlated.

Baseline Data:

Data gathered during the social and environmental assessment used to describe the relevant existing conditions of the project, such as physical, biological, socio-economic, and labor conditions, including any changes before the project commences.

Biodiversity:

The variability among living organisms from all sources, including, among others, terrestrial, marine, river, lake, wetland ecosystems and the ecological complexes of which they are a part; it also includes diversity within species, between species and ecosystems (UN, 1992).

Ecosystem:

A dynamic complex of plants, animals, and microorganisms, and their non-living environment interacting as a functional unit. Some examples include deserts, coral reefs, wetlands, and rainforest (MA 2005), ecosystems are part of natural capital.

Ecosystem services:

Benefits obtained from ecosystems.

Provisioning:

Material outputs from nature (e.g. seafood, water, fiber, genetic material).

Regulating:

Indirect benefits from nature generated through regulation of ecosystem processes (e.g. mitigation of climate change through carbon sequestration, water filtration by wetlands, erosion control and protection from storm surges by vegetation, crop pollination by insects).

Cultural:

Non-material benefits from nature (e.g. spiritual, aesthetic, recreational, and others).

Supporting:

Fundamental ecological processes that support the delivery of other ecosystem services (e.g. nutrient cycling, primary production, soil formation).

8. References

Millennium Ecosystem Assessment (MA). 2005.

<https://www.millenniumassessment.org/en/BoardStatement.html>

WBCSD. 2011. Guidelines on Quarry Rehabilitation, World Business Council for Sustainable Development, December 2011.

<https://www.wbcd.org/Sector-Projects/Cement-Sustainability-Initiative/Resources/Guidelines-on-Quarry-Rehabilitation>

WBCSD. 2014. Biodiversity Management Plan Guidance, World Business Council for Sustainable Development, September 2014.

<https://www.wbcd.org/Sector-Projects/Cement-Sustainability-Initiative/Resources/Biodiversity-Management-Plan-Guidance>

WBCSD. 2018. Methodology for the Net Impact Assessment of Biodiversity in the Cement Sector, World Business Council for Sustainable Development, December 2018.

WBCSD. 2016. Guidelines for Environmental and Social Impact Assessment, World Business Council for Sustainable Development, August 2016.

www.wbcdcement.org/index.php/key-issues/biodiversity/esia-guidelines

Natural Capital Coalition. Official website:

<https://naturalcapitalcoalition.org/>

International Union for Conservation of Nature (IUCN). Official website:

<https://www.iucn.org/>

BirdLife International, Conservation International, IUCN and UNEP WCMC. Integrated Biodiversity Assessment Tool (IBAT). Official website:

<https://www.ibatforbusiness.org/>

9. Appendix

Fig. 1 Development of a QRP or a BMP depending on the biodiversity value of the site.

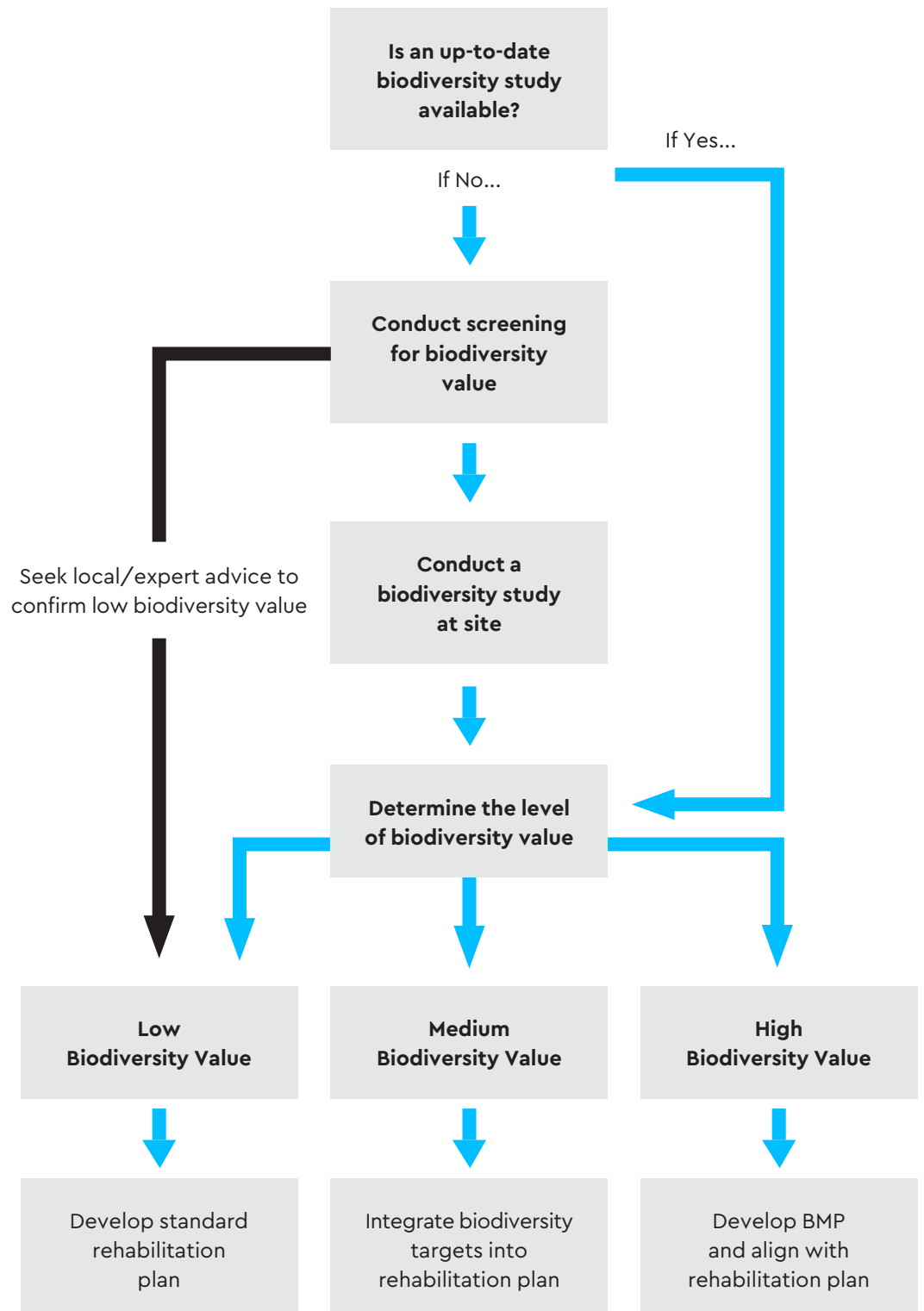
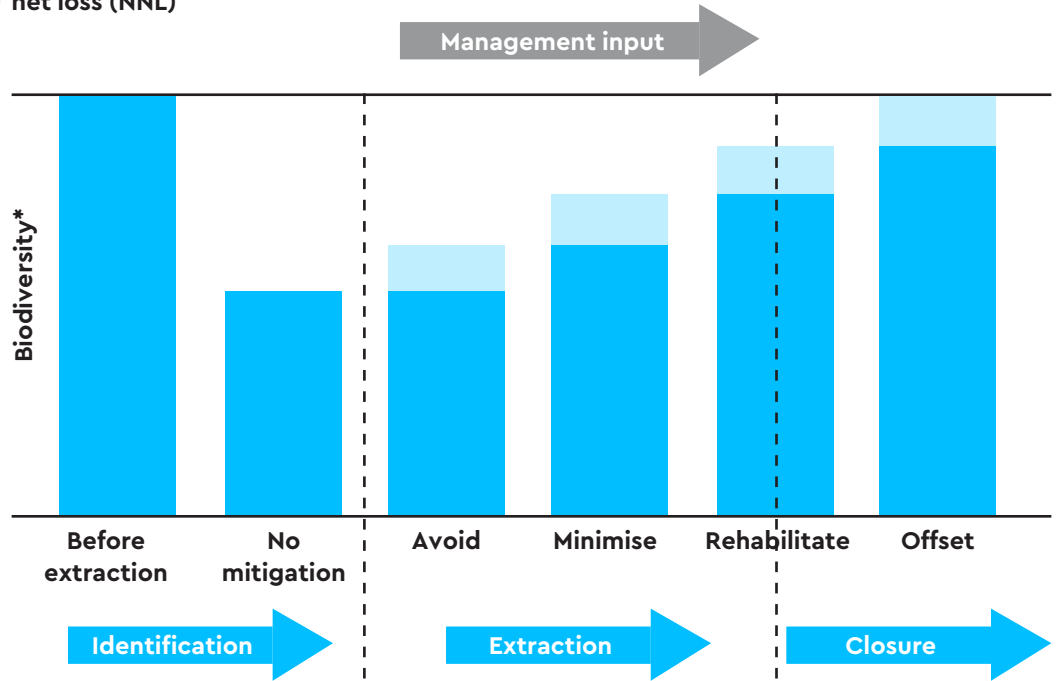


Fig. 2 Summary of the purpose, outcomes and data requirements: ESIA, QRP and BMP

	ESIA	Rehabilitation Plan	BMP
Purpose	To provide a process for evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human health impacts. Undertaken with rigorous scientific analysis and stakeholder engagement.	To specify the actions required to satisfy regulatory, biodiversity conservation and community requirements for the rehabilitation of the impacted part of a site.	To set out actions needed on an on-going basis to preserve/increase nature/biodiversity value and ecosystem services during and after the completion of the extraction activities.
Main Outcomes (Examples)	<ul style="list-style-type: none"> • Predict impacts on biodiversity over different phases of the project. • Collate baseline biodiversity information and conduct targeted biodiversity inventories where such information is missing. • Predict impacts on biodiversity over different phases of the project. 	<ul style="list-style-type: none"> • Set rehabilitation and if necessary, biodiversity targets (see BMP decision tree). • Ensure regulatory requirements are met. • Establish appropriate and desired post-closure land use and management based on stakeholder consultation. 	<ul style="list-style-type: none"> • Set targets and related actions to maintain or improve biodiversity values. • Maximise opportunities for enhancing biodiversity and ecosystems services as a contribution towards the remediation of significant global, regional and local biodiversity losses.
Minimum data requirements	<ul style="list-style-type: none"> • Maps of ecosystems and habitats of site and immediate environs. • Species list for higher plants and vertebrates • Information on seasonal use of site by species. 	<ul style="list-style-type: none"> • Subject to biodiversity sensitivity at the site i.e. a sensitive site will require a detailed quantitative and qualitative information on all ecosystems and/or species to be targeted by biodiversity management actions. For sites with lower biodiversity value, a BMP may not be required (see BMP decision tree). 	
Applicable site life-cycle phase	Planning & development phase (may be months or years in duration).	<ul style="list-style-type: none"> • Operational/ extraction phase. • Site closure phase. 	<ul style="list-style-type: none"> • Operational/ extraction phase. • Site closure phase.

Fig. 3 The mitigation hierarchy showing the connection between biodiversity ambition/target, management input, and level of biodiversity leading to no net loss (NNL)



*Advice should be sought as to how biodiversity is measured, e.g. species richness, habitat area, etc.

Fig. 4 The mitigation hierarchy showing the connection between biodiversity ambition/target, management input, and level of biodiversity leading to net positive impact (NPI)

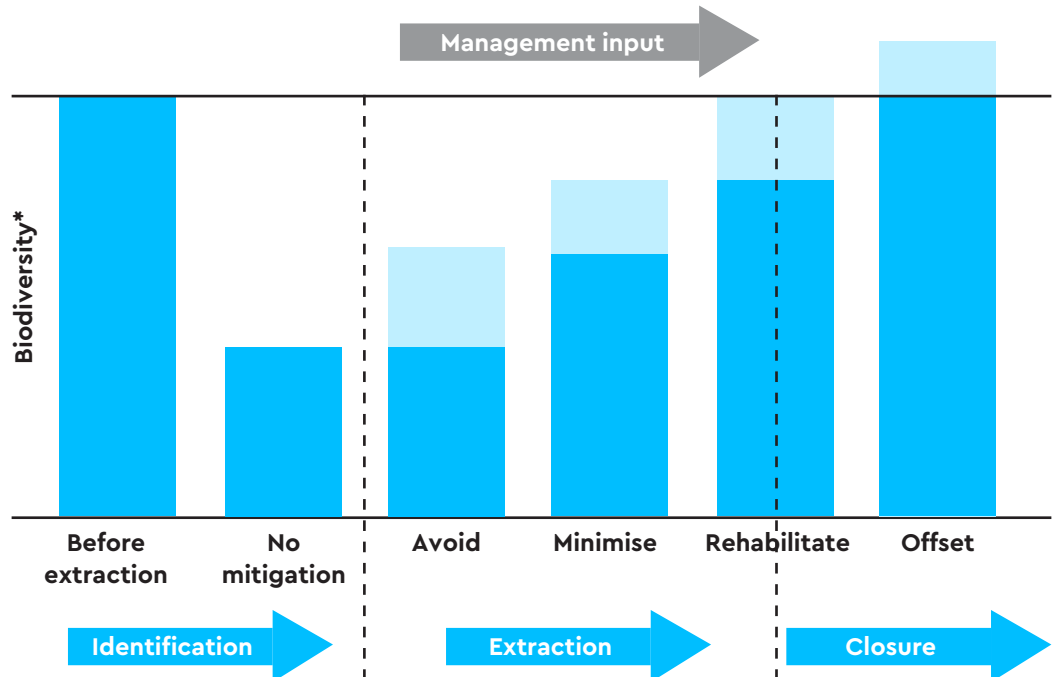
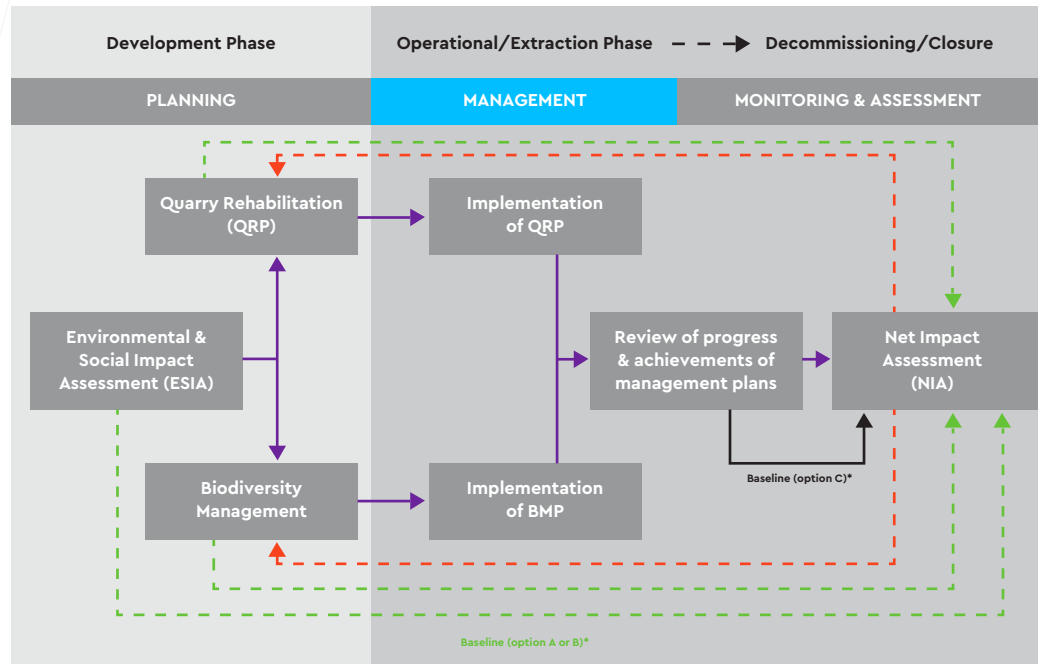


Fig. 5 Interaction of NIA with ESIA, QRP and BMP



- > Sequence for the development, implementation, monitoring and assessment of management plans at quarry sites.
- -> Baseline information (option A or B)* for the NIA methodology.
- > Baseline information (option C)* for assessing/measuring progress after implementing management plans.
- -> Feedback from NIA to confirm/adjust/revise/improve management plans and their targets/objectives.