

MSCI Carbon Project Ratings - Afforestation, Reforestation and Revegetation (ARR) Methodology

MSCI ESG Research

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1. Methodology overview

Objective

MSCI Carbon Project Ratings are composite ratings that independently assess the integrity and risks of carbon credit projects across multiple criteria, including their impacts on the climate, environment and society.

A project with a higher rating has a greater likelihood of having a positive emissions impact and a reduced risk of overestimating its emissions impact. It is also more likely that such an emissions impact will have been implemented in a way that supports positive social and/or environmental outcomes and upholds legal and ethical standards. Consequently, a project with a higher rating has a lower likelihood of incurring reputational risks.

Document description

This document describes the detailed project type-specific methodology used to assess Carbon Project Ratings and Pipeline Carbon Project Ratings (but not Preliminary Carbon Project Ratings) for ARR projects.

This project type-specific methodology is applied in addition to, and partially in replacement of, the methodology that is described in the overall MSCI Carbon Project Ratings methodology document, "MSCI Carbon Project Ratings and Assessments Methodology." Where an element of the overall methodology is replaced by this project type-specific methodology, it is detailed below. Every element of the overall MSCI Carbon Project Ratings methodology also applies to MSCI ESG Research's assessment of Carbon Project Ratings and Pipeline Carbon Project Ratings for ARR projects unless explicitly excluded in this document.

Section 2 introduces the core concept of carbon credit integrity and why its assessment is important to the development of the global carbon credit market. Section 3 introduces and defines ARR projects. Sections 4-8 provide details on the project type-specific methodology, including data sources and assumptions, used in MSCI ESG Research's Carbon Project Ratings and Pipeline Carbon Project Ratings assessments for ARR projects.

2. Introduction to carbon project integrity

What is carbon credit integrity?

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Carbon credits have varying quality characteristics. These stem from fundamental differences in project types, but also from which methodologies have been used to define each project and create the credits (these methodologies are among the standards set by carbon crediting programs, and are hereafter called crediting program methodologies) and how rigorously they have been applied. Projects also differ in terms of their potential co-benefits and their legal and ethical characteristics.

This variation in quality was not intended. Standard setting and governance bodies attempted to create a system in which all carbon credits had an equivalent climate benefit (representing a tonne of carbon dioxide equivalent [CO₂e] removed or avoided) which could be used for voluntary or compliance purposes. This effort dates back to the Clean Development Mechanism (CDM) created under the 1997 Kyoto Protocol and has continued with the evolution of the carbon credit market.

A key challenge lies in the quantification of the climate benefit of a project - i.e., whether the carbon credits calculated for a project are genuinely equivalent to mitigating or removing one tonne of carbon dioxide from the atmosphere. This difficulty stems from the calculation method used to determine what would have happened in the absence of a project, i.e., in the "baseline" scenario (sometimes referred to as the "counterfactual" scenario).

Another difficulty is that projects differ hugely in age, size and technology. The science behind some crediting program methodologies has also evolved over time, as has the enforcement of standards and levels of governance.

Readers should note that, within the carbon markets, the words "quality" and "integrity" tend to be used somewhat interchangeably. Through the rest of this document, we use the word integrity when referring to carbon projects.

The importance of assessing carbon credit integrity

Corporate climate action is critical in the fight against climate change, and carbon credits represent an important mechanism for corporates to mitigate their carbon footprint. However, concerns over carbon credit integrity may have held back, and may continue to hold back, the global carbon credit market from reaching its potential. These concerns center around the perception that many carbon credits are of low integrity and are not delivering the benefits they claim to.

In 2021, the Taskforce for Scaling the Voluntary Carbon Market (TS-VCM) found that credit integrity was at the "heart of buyers' hesitancy,"¹ with 45% of buyers identifying it as a key pain point. Buyer concerns around credit integrity and the related risk of being accused of greenwashing due to the use of low-integrity credits have only grown since then. For example, some 55% of respondents to an April 2023 survey run by the Science-Based Targets Initiative (SBTi) stated that the risk of a greenwashing accusation was stopping them from buying more credits.²

Concerns over carbon credit integrity have been central to the creation of two major initiatives: the Integrity Council on the Voluntary Carbon Market (IC-VCM) and the Carbon Credit Quality Initiative

¹ "Taskforce on Scaling Voluntary Carbon Markets: Summary of the Public Consultation Report," IC-VCM, June 3, 2021.

² "Beyond Value Chain Mitigation (BVCM) Research," SBTI_press_release, September 1, 2023.



(CCQI). The IC-VCM aims to create minimum standards of integrity with a set of Core Carbon Principles (CCPs), and the CCQI has developed a scoring system for certain project types. Both initiatives primarily assess integrity at the project-type level (primarily based on a project's methodology used) or at the project-registry level (a project registry is an organization that registers mitigation activities and issues carbon credits for the emission reductions or removals achieved by the mitigation activities). Neither initiative assesses integrity at the individual-project level.

MSCI ESG Research's assessment methodology draws on the IC-VCM's and CCQI's approach to assessing integrity, building on their principles to apply a more in-depth evaluation of integrity at the individual-project level.

The key components of carbon project integrity assessment

Market approaches to assessing carbon project integrity typically focus on three main issues:

- A. Emissions impact integrity: How much CO2e has been reduced/removed?
- B. Implementation integrity: How did that project reduce/remove that CO2e?
- C. Usage integrity: How are the credits then reviewed and used?

Emissions impact integrity and implementation integrity can each be further broken down into three main areas of common concern. These are summarized in **Figure 1** and outlined in detail below.

Emissions impact integrity, implementation integrity and usage integrity are each described in more detail in the overall MSCI Carbon Project Ratings methodology document "MSCI Carbon Project Ratings and Assessments Methodology."



Figure 1: Key components of carbon project integrity

Carbon Credit Integrity



3. Introduction to ARR projects

What are ARR projects?

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The world lost one-third of its forest in the last millennium,³ and this decline is still continuing due to deforestation. Alongside protecting areas from further deforestation (as targeted through carbon credit projects known as REDD+), reforestation and afforestation projects can play a pivotal role in maintaining and increasing the world's forest cover. A study by NASA found that increasing the earth's forest cover by 25% could absorb 200 gigatonnes (Gt) of CO₂ from the atmosphere (for context, global emissions tend to average between 30-40 Gt per year).⁴ Companies, communities, and cities have hence started working towards this ambition, through aggressive tree planting pledges and initiatives.

ARR stands for afforestation, reforestation and revegetation, representing different types of projects aimed at converting non-forested land to forested land. Reforestation involves planting trees in areas that were previously forested, afforestation involves planting trees in areas in which there were no trees before, thus creating new forests, while revegetation involves replanting the soil of disturbed land. By creating new forests or restoring old forests, these projects can absorb carbon dioxide while protecting and enhancing important wildlife habitats and ecosystems. As a result, ARR projects are known as nature-based "removal" carbon projects.

Market Overview

ARR projects represent one of the fastest-growing project types within the voluntary carbon market. As of October 2023, 346 registered ARR projects had issued over 150 Mt CO₂ of carbon credits.⁵

As a proportion of nature restoration projects overall, the numbers of ARR projects and issuances have grown rapidly since 2017, with ARR becoming the largest project subtype within the nature restoration project type in 2021, as shown in **Figure 2**.

A high number of ARR projects in registry registration pipelines means that their importance will continue to grow. Issuances from known ARR projects are expected to reach 100 Mt CO₂ per year in 2030, which would represent the second largest project subtype within the voluntary carbon market.

³ Our World In Data (2021). "The world has lost one-third of its forest, but an end of deforestation is possible." <u>https://ourworldindata.org/world-lost-one-third-forests</u>

⁴ NASA (2019). "Examining the Viability of Planting Trees to Help Mitigate Climate Change." <u>https://climate.nasa.gov/news/2927/examining-the-viability-of-planting-trees-to-help-mitigate-climate-change/</u>

⁵ Registries included: Verra, Gold Standard, Climate Action Reserve, American Carbon Registry, Puro Earth, Plan Vivo, Clean Development Mechanism (NDC Eligible), BioCarbon, EcoRegistry, Climate Forward, Pacific Carbon Standard, and UK Woodland Carbon Code.





Figure 2: Proportion of annual issuances by nature restoration project subtype

Key Integrity Considerations

While the promise of ARR projects is high from both a carbon and biodiversity perspective, the execution and quantification of these projects involves a number of challenges. Assessing the integrity of ARR projects requires a detailed analysis of the project's design, execution, and assumptions, with risks primarily found in four main areas:

- **Baseline Reforestation:** Reforestation may have occurred even without carbon credits, due to either naturally driven forest growth or tree planting occurring as an expected component of the commercial harvesting cycle.
- **Carbon Stock:** To estimate the amount of removals that the project creates, the project must accurately estimate the carbon stock within the project area over time. Measuring the carbon within a single tree is complex. Measuring the carbon within an entire forest is even more challenging.
- **Forest Permanence and Survival:** The long-term success of an ARR project fundamentally depends on whether new trees survive and reach their carbon sequestration potential. Tree mortality rates can regularly be over 50% if the planting design or execution is not effective.
- **Biodiversity Impact:** Forests can play a vital role in restoring biodiversity through housing and protecting flora and fauna. However, the ecosystem richness of a forest is not guaranteed. Projects that plant a diverse set of suitable (regularly native) trees to the project area are much more likely to achieve high biodiversity outcomes.

MSCI ESG Research assesses each of these five key risk areas in detail when evaluating the integrity of for an ARR project.



4. Approach to assessing the integrity of ARR projects

MSCI ESG Research's assessment of ARR projects builds on the overall MSCI Carbon Project Ratings methodology to provide more in-depth analysis of ARR projects. This project type-specific assessment includes sub-criteria that are additional to, and partially in replacement of, the sub-criteria of assessment used in the overall MSCI Carbon Project Ratings methodology, as detailed below. These project type-specific sub-criteria evaluate a deeper set of questions, which are focused on the most important, specific drivers of integrity for ARR projects.

These project type-specific assessments are conducted at the individual project level, including a review of each individual project's data and assumptions. In this way, these assessments represent a more granular, project-level review of ARR projects than what would be possible using the overall MSCI Carbon Project Ratings methodology alone.

In total, MSCI ESG Research assesses 12 sub-criteria and 24 metrics (see Figure 4) under this project type-specific methodology that are either not assessed or are assessed differently in the overall MSCI Carbon Project Ratings methodology, as illustrated in **Figure 3**. These sub-criteria are focused on addressing the key drivers of integrity for ARR projects. Each of these sub-criteria align with and replace corresponding sub-criteria scores in the overall MSCI Carbon Project Ratings methodology.



Figure 3: MSCI Overall Carbon Project integrity assessment

Carbon Project Integrity





MSCI CARBON PROJECT RATINGS - AFFORESTATION, REFORESTATION AND REVEGETATION (ARR) METHODOLOGY |

Figure 4: ARR assessment framework





Assessment of all other criteria and sub-criteria, for example, Criterion 5, Legal and Ethical Risks, and Sub-criterion 1.4, Baseline Approach, within the ARR analysis use the same metrics and methodology as in the overall MSCI Carbon Project Ratings methodology framework. The granularity of the overarching framework for those sub-criteria, and the fact that their assessment is consistent across all project types (i.e., with no ARR-specific characteristics), means that no further enhancement is required.

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5. Criterion 1 – Additionality

If a mitigation activity is not additional, then purchasing carbon credits has not led to any additional reduction or removal of emissions. Additionality is therefore a crucial component of the integrity of carbon credits. A non-additional carbon credit has no direct net positive environmental impact given that the emission reductions/removals would have occurred anyway. However, it is worth noting that funding a non-additional credit may still indirectly help stimulate further investment in the same activity by raising its return.

The additionality of a project is not necessarily binary. Projects may be partly additional, where only a portion of emission reductions/removals are additional. For example, if, in the baseline scenario, some emission reductions would have been achieved anyway, but not as much as was achieved by the project, then only this difference in emission reductions is additional. If credits are issued for the total emission reductions rather than only the reductions that wouldn't have otherwise been achieved, then the credits are only partly additional.

There are two main components to assessing additionality: (i) is it likely a project's activities would have occurred without the incentive of a credit, and (ii) how accurately does a project's baseline scenario represent the amount of the CO_2e reduced/removed in the baseline scenario?

MSCI ESG Research's assessment of the additionality of ARR projects focuses on evaluating seven key topics. Figure 5 illustrates the project-type specific sub-criteria and metrics through which the additionality of ARR projects is assessed, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they refer to. The detailed sub-criteria are described in Figure 6.

Given the probabilistic nature of additionality, MSCI ESG Research scores projects based on the *likelihood* that their emission reductions or removals are additional. To achieve a high additionality score, a project's activities must be additional (sub-criteria 1.1, 1.2 and 1.3) and its baseline scenario reasonable (sub-criteria 1.4 and 1.5).

An inverse weighting formula is used to determine a project's overall additionality score, where the combined scores of sub-criteria 1.1, 1.2 and 1.3 are inversely weighted with the combined scores of sub-criteria 1.4 and 1.5. As a result, a good score in any one criterion cannot offset a low score in another.

For example, an ARR project's tree planting activities might be very additional given there may have been few incentives for planting without carbon credits. However, if the project area was likely to experience significant plant regrowth anyway, then the project's removals may not be (fully) additional.







Figure 6: MSCI Additionality integrity assessment framework

| Sub-cı | iteria | Metrics | Rationale | REDD+ | Renewables | ARR | Cookstoves | Biochar | Landfill Gas | Safe Water | IFM | Waste Mgmt. | Blue Carbon |
|--|------------------------------|--|--|--|-------------------|-----|------------|---------|--------------|------------|-----|-------------|-------------|
| redits | ditionality | 1.1.1.1 % of Revenue from Carbon Credits | The higher the proportion of a project's revenue that comes from carbon credits, the greater the importance of credits to its financial attractiveness. | higher the proportion of a project's enue that comes from carbon credits, the ater the importance of credits to its ncial attractiveness. | | | | | | ~ | ~ | ~ | ~ |
| l t Carbon C | nancial Ad | 1.1.1.2 IRR Analysis | Credits should play a decisive role in making a project financially attractive that would otherwise have not been. | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| 1.' /es withou | 1.1.1 Fi | 1.1.1.3 Prior Consideration | Carbon credits should have been clearly considered at the time the decision to go ahead with a project was taken. | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| Incentiv | 1.1.2 Barrier Analysis | Strength of Barriers | Projects that face high barriers to implementation would be less likely to go ahead without the added incentives of carbon credits. | × | ~ | × | ~ | ~ | × | ~ | 8 | ~ | ~ |
| 1.2 Common Market Practice Penetration | | Market Penetration | If a practice is already common within a market, it indicates that these types of project are more likely to go ahead without the introduction of carbon credits. | x | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| 1.3 Legal Legal Considerations Requirements | | Legal Requirements | Projects that are legally required or incentivized are unlikely to be additional. However, if laws are not enforced, then may still be additional. | × | * | * | × | * | ~ | × | ~ | ~ | ~ |
| 1.4 Ba Approa | iseline ach | Baseline Approach | Each project methodology is scored on the extent to which it mitigates the key risks associated with establishing a baseline scenario. | ~ | * | * | × | * | * | × | ~ | * | ~ |
| 1.5 Baseline Reasonableness | | 1.5.1 Baseline Transparency | Transparent detail on a project's assumptions is required to make an objective assessment of a project's performance and additionality. | ~ | × | ~ | x | × | × | x | < | × | ~ |
| | | 1.5.2 Baseline Assumptions | MSCI ESG Research assesses the key baseline scenario assumptions for each project type — for example, for REDD+ projects we validate a project's baseline deforestation rates. | ~ | * * * * * * * * * | | ~ | ~ | | | | | |
| 1.6 Re Green | d and Flags | News scanning | Review of academic papers, industry sources and the news for Red or Green Flags to project's additionality. | | | ~ | Stan | dardiz | ed ap | proa | ch | | |

🗸 Assessed 🛛 😕 Not Assessed



1.1.1.1 % of Revenue from Carbon Credits

% of Revenue refers to the proportion of a project's total revenue that comes from the sale of carbon credits.

| Rationale | The higher the proportion of a project's revenue that comes from carbon credits, the greater the likely importance of carbon credits to the financial attractiveness of the project. If credits only represent a fraction of the financial return for the project, but project still claims credits representing 100% of the emission reductions or remove achieved, additionality is more uncertain. | | | | | | | |
|--------------------|---|---|--|--|---|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is revenue comes only source of r | scored on a 1 from carbon evenue for th | -5 scale, where 1 credits and 5 ind e project. | l indicates tha licates that ca | at a very low pr arbon credits a | oportion of re likely the | | |
| Scoring Approach | MSCI ESG Reset the sources of r Where financial each revenue se engage in timbe harvested is us compared to ca credit pricing for Projects then re carbon credits a | arch conduct evenue of a p data is not p ource given the purce given the rharvesting, ed in order to rbon credits, r ARR project eceive a score are estimated | is a detailed revie project. resent, the rough ne project's activi information on t estimate the sig given estimated is. e from 1 to 5 base to represent. | ew of project of proportion of ities. For exan he % of the la nificance of th annual issuar ed on the prop | documentation f revenue is est nple, for projec nd area that is nis revenue sou nces and avera portion of rever | to identify imated for ts that planned to be urce ge realized nue that | | |

1.1.1.2 IRR Analysis

It is important for ARR projects to demonstrate that without carbon credits there would have been more profitable alternative uses of that land than tree planting. Projects can evidence this by transparently estimating the profitability of alternative land uses. Projects that conduct this analysis and illustrate a high degree of difference between the project scenario and the most profitable alternative land use support their additionality claims.

There are two metrics that are used to evaluate this sub-criterion:

- **1.1.1.2.1 Financial Tests and Transparency:** Whether the project uses a detailed and transparent approach to their financial analysis.
- **1.1.1.2.2 Financial Differences:** Whether there is a significant difference in profitability between the most profitable alternative land use and the project's activities.

The overall score for this sub-criterion is reached by weighting each of these factors 25% and 75% respectively.

1.1.2.1 Financial Tests

Financial tests refer to whether the project uses a transparent approach to their financial analysis.



| Rationale | A project that conducts a more detailed financial analysis, in which key information is transparently given, provides more support and credibility to the outcome of this analysis. | | | | | | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is appear to have conducted a fu transparently ir | Each project is scored on a 1-5 scale, where 1 indicates that the project does not appear to have conducted any financial analysis and 5 indicates that the project conducted a full IRR or NPV analysis, and included detailed cost assumptions transparently in its documentation. | | | | | | |
| Scoring Approach | MSCI ESG Research reviews the approach that a project took (if any) regarding its financial analysis and the types of tests performed. | | | | | | | |
| | | | | | | | | |

1.1.2.2 Financial Differences

Financial differences relate to the magnitude of the difference between the expected profitability of the most profitable alternative use of the land, and the profitability of the project's activities without carbon credits.

| Rationale | If the project area could have been used for a more financially attractive land use of than the project's activities, then it indicates that the project activities would not ha gone ahead in the absence of carbon credits. Alternatively, if no other more financ attractive land use existed for the project, then the project may have gone ahead e without carbon credits. | | | | | | |
|--------------------|--|--|---|--|---|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | | | |
| Scoring Definition | Each project is thought to be ea profitable land t carbon credits). | scored on a 1 qual to the m use is more th | I-5 scale, where f ost profitable lan han 10x the profi | 1 indicates thand use and 5 ir tability of the provide the provided the prov | at the project's adicates that th project's activit | activities are le most ties (without | |
| Scoring Approach | MSCI ESG Rese uses that the pr compared to the | arch identifie oject present e profitability | es the expected p ted. The profitabi of the project sc | profitability of t lity of the most enario withou | the different al st profitable lar t carbon credit | ternative land nd use is then s. | |
| | Projects are then scored on a 1 to 5 scale based on this difference, with projects receiving a higher score the greater the difference in profitability. | | | | | | |

1.1.3 Prior Consideration

Projects that can demonstrate that carbon credits were considered prior to their decision to start, provide more evidence that credits acted as an important incentive in starting mitigation activities.



Two key sub-criteria are used to evaluate this:

- **1.1.3.1 Evidence of Consideration**: Whether any evidence exists that credits were considered prior to the project start.
- **1.1.3.2 Registration Gap:** Whether a significant gap exists between the start of the project's activities and the initial registration and issuance date.

The overall score for 1.1.3 Prior Consideration is determined by an equal weighting of these subcriteria.

1.1.3.1 Evidence of Consideration

Evidence of consideration refers to whether the project has specific evidence that demonstrates that the use of carbon credits was considered prior to the project start date.

| Rationale | Evidence that carbon credits were considered prior to the project start date indicate that credits played an important role in this decision process. On the other hand, is evidence of prior consideration exists, there is a higher chance that the decision to ahead with the project occurred without any expectation of carbon credits. | | | | | | | |
|--------------------|---|--|--|--|---|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is made available, exists. | scored on a 1 and 5 indicat | -5 scale, where 1 tes that good qua | l indicates tha ality evidence | at no evidence of prior consid | has been leration | | |
| Scoring Approach | MSCI ESG Rese considered prio notification of in carbon credit co analyzed. The date of any project start dat or not. | arch identifie r to the project ntent sent to a ponsultant, or b evidence of c te to determin | s whether any ev ct start date. This a registry (such a board meeting m carbon credit cor ne whether credit | vidence exists s evidence ma as CDM or Ver inutes indicat nsideration is ts were consid | that carbon cr ay include a lett ra), the employ ing that carbor then compared dered prior to th | edits were ter or ment of a n credits were I to the ne start date | | |

1.1.3.2 Registration Gap

Registration gap evaluates the gap between the start date of the project activity and the project being registered with a crediting standard and able to issue credits.

| | A longer gap between the start of project activity and the project's registration suggests the project was able to maintain, at least to an extent, activities, and |
|-----------|---|
| Rationale | investment even in the absence of carbon credits. If credits were very important and |
| | decisive in the project going ahead, then we would typically expect a project to work |
| | hard to minimize this time taken in the registration process. |



| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
|--------------------|---|---|---|--|--------------------------------------|----------------------------|--|--|
| | | | | | | | | |
| Scoring Definition | Each project is the initial decis inconsequentia | Each project is scored on a 1-5 scale, where 1 indicates a very significant gap between the initial decision date and the registration date and 5 indicates a short or inconsequential gap. | | | | | | |
| Scoring Approach | MSCI ESG Rese date and comp project using th | earch analyze ared this to t ne MSCI Carb | es project docum he date of registr oon Markets platf | entation to de ation and date orm. | termine the pro e of first issuan | ject's start ice of the | | |
| | The project stated start date is compared to the registration/issuance date and then categorized the gap between these dates into a 1 to 5 scale. | | | | | | | |

1.2 Barrier Analysis

Barrier Analysis refers to whether the project accurately justifies its case that significant barriers to implementation exist that carbon credits helped to overcome.

| Rationale | Projects that offer detailed evidence that carbon credits played a decisive role in going ahead inspire greater confidence in their additionality. Projects that have conducted additionality tests, provided detailed information on their barriers, and various, high-quality sources to support these, are more likely to be additional. Hi quality sources may come through academic references or detailed surveys of th local population. | | | | | | |
|--------------------|--|--|--|--|--|---|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | \checkmark | \checkmark | |
| Scoring Definition | Each project is barriers to entry that there are s quality evidence | scored on a ´ y which are n everal barrier e. | 1-5 scale, where ´ ot supported with s to entry which l | 1 indicates than high-quality have been sup | at there are insi evidence and 5 oported by a rai | gnificant i indicates nge of high- | |
| | MSCI ESG Rese documentation | earch reviews | the barrier analy | sis performed | l by a project w | rithin its key | |
| Scoring Approach | The strength of of evidence. Fo awareness, tec by the project to financial data, e | ^f this barrier a r range, the n hnological) a o justify the e expert input, o | analysis was then number of barriers re assessed. For existence of these or third-party data | evaluated ba s identified (su quality of evic e barriers, suc a, are assesse | sed on its rang uch as investm lence, the key s h as primary re d. | e and quality ent, social sources used search, | |
| | The number of barriers and sources of evidence are both scored on a 1 to 5 scale, with the overall score reached through weighting these factors 70% and 30% respectively. | | | | | | |



1.2 Common Practice

If planting initiatives were already common practice within a region at the time a project started, then it suggests that the project's activities could have been implemented without carbon credits.

There are two metrics that are used to evaluate this sub-criterion:

- **1.2.1 Evidenced Common Practice:** Whether the project clealry evidences that the project was not common practice in that region.
- **1.2.2 Geospatial Common Practice:** The extent to which forest cover and growth is common in the area surrounding the project, as determined through a geospatial assessment of forest fragmentation.

Each of these criteria is assessed independently on a scale of 1 to 5.

The overall score is then based on weighting 1.2.1 Evidenced Common Practice 25% and 1.2.2 Geospatial Common Practice 75%.

1.2.1 Evidenced Common Practice

Evidenced Common Practice relates to whether the project clearly evidences that the project was not common practice in that region.

| Rationale | By providing a well-evidenced justification and evaluation that the specific mitigation activity is not common practice in that specific region, projects can demonstrate the the nuances of their activities are unique and not common. | | | | | | |
|--------------------|--|---|---|-------------------------------------|--------------------------------------|--------------------------------|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | | | |
| Scoring Definition | Each project is a was conducted revealed no sim | scored on a 1 and 5 indicat ilar projects o | -5 scale, where 1 tes a well-eviden exist in that regio | l indicates no ced common on. | common pract | tice analysis onducted that | |
| Scoring Approach | MSCI ESG Rese practice analysi | arch reviews s was perfor | project documer med and, if any, ł | ntation to ass now many sim | ess what type o ilar projects wo | of common ere identified. | |
| | The type of con based on the ty | nmon practice pe of practice | e analysis is sco e analysed and th | red on a four-j ne number of s | point scale fror similar projects | n 1 to 5 identified. | |

1.2.2 Geospatial Common Practice

Geospatial Common Practice assesses the extent to which forest growth is common in the area surrounding the project, as determined through a geospatial assessment of forest fragmentation.

A geospatial analysis of the areas surrounding the project can reveal whether similar
reforestation or afforestation initiatives are common practice in the area. If the
surrounding areas have experienced significant recent forest growth and/or have very
high forest cover, it indicates that these types of initiatives may already be common
practice in that locality.



| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
|--------------------|---|---|---|---|---------------------|------------------------|--|--|--|
| | \checkmark | \checkmark | | | | | | | |
| Scoring Definition | Each project is levels and grow have been no c | Each project is scored on a 1-5 scale, where 1 indicates the surrounding area has high levels and growth in forest cover, and 5 indicates that forest cover is low and there have been no changes in forest fragmentation. | | | | | | | |
| | A forest fragme changes from 2 location. | A forest fragmentation index (FFI) is used to map forest fragments and their temporal changes from 2000 to 2020, in a 50km radius-defined area surrounding each project location. | | | | | | | |
| | Forest patch sit the analyzed sit as a highly frag patches, locate ranges from 0 th fragmentation, highly fragmen | Forest patch size, number and density are the building blocks of the FFI. That is, when the analyzed site is composed of small and low-density patches of forest, it's labelled as a highly fragmented forest. On the other hand, the presence of fewer and wider patches, located closer together, constitute a denser forest and a low FFI. The FFI ranges from 0 to 1, where values from 0-0.2 represent areas with low forest fragmentation, 0.2-0.7 represents medium forest fragmentation, and 0.7-1 represents highly fragmented forest. | | | | | | | |
| Scoring Approach | High forest fragmentation does not only describe the spatial distribution of forest patches, but it is also a symptom of forest degradation. A lower FFI results in a more resilient and healthy forest when this is managed following best practices, whereas a higher FFI can be a proxy of a degraded or low forest cover. | | | | | | | | |
| | Furthermore, for degradation. For reforestation pr activities may i | prest fragmer prest fragmer roject is base mprove the s | ntation is a major ntation reduces w ed in a region with upport of local w | on is a major driver of biodiversity loss and ecosystem on reduces wildlife food resources and habitat. When a a region with high forest degradation, the reforestation ort of local wildlife populations. | | | | | |
| | For the purpose of tracking forest fragmentation, the Forest Fragmentation Change dataset, a spatially explicit global dataset created by Jun Ma, et al. (2023) ⁶ , is used. | | | | | | | | |
| | Both the level and change in forest cover for each project is evaluated, with projects scored across both of these dimensions. | | | | | | | | |

1.5 Baseline Reasonableness

Land may experience natural biomass regrowth or regeneration even without the project's activities. Some research even indicates that forests that regrow naturally may store more carbon.⁷ It is also possible that the land would have been (re)planted by the owners of the land anyway, even without the incentive of carbon credits (e.g., as part of a timber company's normal harvesting cycle). The amount of carbon sequestered through these alternative non-carbon credit land uses (the 'baseline'

⁶ Ma, J., Li, J., Wu, W. et al. Global forest fragmentation change from 2000 to 2020. Nat Commun. 14, 3752 (2023). https://doi.org/10.1038/s41467-023-39221-x

⁷ Mo, L., Zohner, C.M., Reich, P.B. et al. "Integrated global assessment of the natural forest carbon potential." *Nature* (2023). https://doi.org/10.1038/s41586-023-06723-z.



scenario) should be deducted from the total carbon sequestered by the project to derive the amount of carbon credits that it can issue.

Therefore, it is important that ARR projects appropriately assess the potential uses of their project area, and the associated biomass regrowth of each, in their baseline scenario (i.e., the counterfactual scenario without the project's activities).

As it is not possible to know for certain what would have happened in this counterfactual scenario, assessing the reasonableness of a project's baseline scenario assumptions must be done in a probabilistic way.

Two sub-components are considered to evaluate a project's baseline reasonableness:

- **1.5.1 History and Ownership:** Whether the history and ownership of the project and surrounding area suggests that afforestation/reforestation was likely.
- **1.5.2 Reasonableness of Baseline Removals:** Whether the project appropriately accounts for carbon removals that would have occurred without the project, given the baseline scenario.

Each of these criteria is assessed independently on a scale of 1 to 5. The overall score is reached through an equal weighting of both sub-criteria.

1.5.1 History and Ownership

The history and ownership structure of a project area are an important input in determining the extent to which reforestation of that area was likely in the absence of carbon credits.

Two main factors are considered as part of this assessment:

- **1.5.1.1 Plausible Ownership Structure:** Whether afforestation/reforestation (without credits) is plausible given the ownership structure of the project area.
- **1.5.1.2 Forested Area History:** Whether natural reforestation is plausible given the historic levels of forest cover in the project area.

Each of these sub-criteria is assessed on a scale from 1 to 5. The overall score for 1.5.1 History and Ownership is determined by weighting these two factors by 10% and 90% respectively.

1.5.1.1 Plausible Ownership Structure

Plausible Ownership Structure relates to the extent deforestation of the project area was considered likely given the ownership structure of the project area.

| Rationale | Some project a to have planted case, the sale o have otherwise | Some project areas may be owned by individuals or organizations that are more likely o have planted trees or (re)grown forests, even without carbon credits. If this is the case, the sale of credits does not remove any additional carbon versus what would have otherwise occurred. | | | | | | | |
|--------------------|---|---|---|---------------------------------------|------------------------------|------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | | | | | | | | | |
| Scoring Definition | Each project is reforestation a | scored on a nd 5 indicate | 1-5 scale, where s very low plausil | 1 indicates that oility of refores | at very high pla station. | usibility of | | | |



MSCI ESG Research reviews a project's documentation to identify the current landowner(s) and project proponent(s). The plausibility of reforestation given that owner/proponent is then assessed with projects scored on a 1 to 5 scale based on this plausibility.
 For example, projects that are run by timber companies that have a long history of growing and harvesting land are more likely to have reforested the project area anyway (and hence score a 1) versus projects that are community-owned or owned by small-scale agricultural farmers.
 Note that timber companies can often adjust their natural harvesting cycles to improve the sequestration of carbon that occurs on their land. However, this activity is incentivized through a different type of carbon credit project, known as Improved Forest Management (IFM) and, hence, benefits of this activity should not be incorporated into an ARR project.

1.5.1.2 Forested Area History

Forested Area History relates to whether natural reforestation is plausible given the historic levels of forest cover in the project area.

| Rationale | Projects that took place on recently forested land are more likely to experience natural forest regrowth and regeneration. In contrast, if the project area has remained barren throughout its recent history, the likelihood of natural regrowth is lower. | | | | | | | |
|--------------------|---|--|--|---|--|---|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | \checkmark | | | | | | |
| Scoring Definition | Each project is a forest cover in t harvesting, and | scored on a 1 he project are 5 indicates tl | -5 scale, where ea over the past nat there is no re | 1 indicates tha 10 years and a cent history o | at there has bee a recent history f forest cover c | en very high / of or forest loss. | | |
| | For each project, geospatial analysis is conducted to estimate the historic forest cover of the project area (10 years prior to the project start date, 5 years prior to the project start date, and 2 years prior to the project start date). | | | | | | | |
| Scoring Approach | For projects that assessed throug Any recent char cover trends is previous landow reforest it are n | It have experi gh a combina nge in land ov also consider vner. In this w ot penalized f | enced recent for ation of project d vnership that ma red to control for vay, developers t for actions taken | rest loss, the d locumentation ay represent a r any human d hat purchase l n by the previo | rivers of this for and geospatia departure from eforestation cro and to conserv us landowner. | prest loss are al analysis. n recent forest eated by re and | | |
| | Each project is then scored from 1-5 based on the level of historic forest cover (10 years, 5 years and 2 years prior to the project start) and the drivers of forest loss. | | | | | | | |



1.5.2 Reasonableness of Baseline Removals

Reasonableness of Baseline Removals refers to whether the project appropriately accounts for carbon removals that would have occurred without the project, given its baseline.

| Rationale | An area may ex activities. Project an accounting of do not approprise impact. | perience natu cts should ap of these remo ately account | ural biomass grow opropriately acco wals in their base t for this will likel | wth even in th unt for this ca eline scenario y over-estima | e absence of tl arbon stock gro calculations. F te their total ne | ne project's wth through Projects that et removals | | | |
|--------------------|--|---|--|--|--|---|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | \checkmark | | | | | | | |
| Scoring Definition | Each project is a probability of back calculations, an for baseline rem | scored on a 1 aseline remov d 5 indicates novals given t | -5 scale, where 1 vals but no accou that the project a that project's cha | l indicates tha unting for ther appears to ha iracteristics. | at the project a n in their emiss ve appropriate | rea has high sion ly accounted | | | |
| | Evaluating the r on both (i) the r without the proj has accounted | easonablene isk that basel ect's activitie for. | ss of the project' line carbon stock s; and (ii) the am | s baseline ren ks would have hount of basel | novals account increased in th ine removals th | ting depends ne area nat the project | | | |
| Scoring Approach | The probability use in the basel which the area baseline scenar contrast, projec likelihood of bas project docume removals risk. E based on the pr | that baseline ine scenario was previous io, have high ts that take p seline remova ntation and g ased on the obability of b | carbon stocks w and the historic l ly forested, or ind er probability of s lace on previous als occurring. The geospatial analys previous and bas aseline removals | yould have inc and use of the clude grasslar some natural ly barren or ag e previous lan sis to form an seline land use s occurring. | reased is drive e project area. nd or shrubland removals occur gricultural land, id use is analyz assessment of e, projects are o | n by the land Projects in I in the rring. In , have lower red through baseline categorized | | | |
| | This is then con reductions the p | nbined with v project has ac | vhat amount and ccounted for in th | proportion of neir baseline r | ^f total net emis emovals calcul | sion ations. | | | |
| | Projects are then scored on a 1 to 5 score based on both the risk and level of accounting for baseline removals. | | | | | | | | |



6. Criterion 2 – Quantification

Quantification refers to the likelihood that the emission reduction or removals claimed by a project are accurate, assuming the baseline scenario is correct. It includes both emission reductions or removals within a project area, and those that have occurred outside the project area, known as leakage.

Along with the strength of baseline assessment, Quantification is a key determinant of the risks of over-crediting: whether the number of credits issued by the project is equal to the CO₂e actually reduced/removed. In theory, all carbon credits are worth the equivalent of 1 tonne of CO₂e reduced or removed. A low carbon quantification score means that the emission reductions or removals delivered by the credit is likely to be less than 1 tonne. In this case, buyers should be cautious in using one credit to offset 1 tonne of their own emissions as they are unlikely to be equivalent.

Quantifying an ARR projects' emission removals requires a complex estimation of the project's carbon stock and growth over time. Compared to other nature-based projects, the risk of leakage is inherently lower for ARR projects but must also be considered and accounted for.

As ecosystems spread over an often very large and sometimes inaccessible areas, measurement of ARR projects' carbon stock inevitably involves a degree of estimation and inaccuracy. Historically, carbon stock was measured by teams on the ground taking occasional samples of the area's biomass, although, increasingly, geospatial datasets and analysis are being used to complement this manual sampling.

Figure 7 illustrates the sub-criteria through which MSCI ESG Research assesses the quantification of ARR projects, and the Integrity Assessment framework sub-criteria that they refer to. The detailed sub-criteria are described in Figure 8.



Figure 7: ARR Quantification assessment approach



Figure 8: MSCI Quantification integrity assessment framework

| Sub-criteria | Metrics | Rationale | REDD+ | Renewables | ARR | Cookstoves | Biochar | Landfill Gas | Safe Water | IFM | Waste Mgmt. | Blue Carbon |
|---|-------------------------------|---|-------------------------|-------------------------|-----|------------|---------|--------------|------------|-----|-------------|-------------|
| 2.1 Quantification Approach 2. Approach 7r 4p | 2.1.1 Methodology Approach | Through setting the assumptions that projects must make, and the sources that can be used to estimate them, crediting program methodologies can play an important role in reducing or even increasing the level of quantification risk. | ✓ Standardized approach | | | | | | | | | |
| | 2.1.2 Project Transparency | Transparent documentation and detail on a project's assumptions are required to make an objective assessment of its approach to carbon quantification. | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| | 2.1.3 Project Approach | Two projects with the same methodology may carry different quantification risks depending on the approaches that each uses. | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| 2.2 Assumption Accuracy | Quantification Accuracy | Each project type has a set of key assumptions that determine the accuracy of their carbon quantification. Evaluating the reliability and accuracy of these key assumptions shows whether a project has over- or understated their emission reductions or removals. | ~ | ~ | * | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| 2. P 2.3 Monitoring Performance 2 | 2.3.1 Monitoring Plan | Projects that have effective processes in place to regularly monitor and measure key quantification inputs and assumptions are more likely to accurately estimate and update their emissions impact. | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| | 2.3.2 VVB Analysis | Projects that use a diverse mix of well- regarded verification and validation bodies (VVBs) will improve the likelihood that key quantification details are accurately checked and validated. | | ✓ Standardized approach | | | | | | | | |
| 2.4 Red and Green Flags | News scanning | Review of academic papers, industry sources and the news for Red or Green Flags relating to project's quantification. | ✓ Standardized approach | | | | | | | | | |

2.1.2 Project Quantification Approach

Projects that use scientific best practice techniques to estimate key components of their quantification increase the probability that CO₂e impact will be accurately measured.

There are three metrics that are used to evaluate this sub-criterion:



- **2.1.2.1 Sampling:** Whether the project uses suitable and representative sampling approaches to estimate its carbon stock.
- **2.1.2.2 Stratification**: Whether the project appears to employ an appropriate stratification of the project area.
- **2.1.2.2 Allometric Equations:** Whether the project employs a peer-reviewed and suitable allometric equation as part of its carbon stock calculations.

The overall score for this sub-criterion is reached by weighting each of these factors equally.

2.1.2.1 Sampling

Sampling relates to whether the project uses representative sampling to measure the carbon stock within the project area.

| Rationale | To estimate the carbon stock within their area, projects must use tree measurements from a sample area as an input in their calculations. Given these measurements are then extrapolated over the entire project area, the accuracy of them is dependent on how representative the sampled area is to the entire project area. Projects that use more representative sampling techniques over a larger area increase the chances that this sampled area will be representative of the entire project area. | | | | | | | |
|--------------------|---|--|---|---|--|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | \checkmark | | | |
| Scoring Definition | Each project is sampling representativen | Each project is scored on a 5-point scale from 1 to 5, where 1 indicates a relatively low sampling representativeness and 5 indicates a relatively high sampling representativeness. | | | | | | |
| Scoring Approach | MSCI ESG Rese understand its a during both its a considered. Firs Second, the nur total project are | arch conduct approach to c design and m st, if the proje nber and size a had been s | a detailed revie arbon stock esti onitoring phases ct combined in-fi of plots sample ampled. | ew of each pro mation and its s. For each pro ield sampling ed to understat | pject's docume s sampling pro- ject two key fa with any remot nd what propor | nts to cedures actors are te sensing. rtion of the | | |
| | Projects that sample over 0.1% of their area and support this with remote sensing receive the highest score of 5. Projects that sample less than 0.01% of their project area or do not provide any transparent information on their sampling receive the lowest score of 1. | | | | | | | |

2.1.2.2 Stratification

Stratification refers to whether the project appears to employ an appropriate stratification of the project area.

| Rationale | Stratification relates to the layers of different vegetation within a forest. Appropriately stratifying the project's land into areas of distinct vegetation is an important part of |
|-----------|--|
| Rationale | accurately estimating and recording the carbon stock within a project area. Projects that do not appropriately stratify their land may use samples from one vegetation layer |



to make estimates for another vegetation layer, which may have very different characteristics. Project Project Academic Third-party MSCI Carbon Methodology Geospatial Documentation Literature Data Markets Documentation **Key Sources** ~ ~ ~ Each project is scored on a 5-point scale from 1 to 5, where 1 indicates that no stratification appears to be used despite clear differences in tree species, age and **Scoring Definition** forest type, and 5 indicates that an appropriate amount of stratification has been used by the project. MSCI ESG Research reviews in detail each project's documentation to understand if and how they have created different strata within the project area. The number of strata is then compared to the number of tree species planted to validate whether the stratification appears appropriate based on tree types. Projects receive one point for stratifying their area based on species, age and region **Scoring Approach** respectively (with a maximum score of 3). Projects then could receive an additional 2 points if the number of strata was more than the number of tree species planted in the area.

These individual scores were then summed, with all projects receiving a score of between 1 and 5.

2.1.2.3 Allometric Equations

Allometric Equations relates to whether the project uses peer-reviewed allometric equations that are appropriate for the region, forest type and biome type.

| Rationale | Allometric equ carbon they co appropriatenes equations will relevance to th | nts into the amore erefore depend t scientifically a a project base | ount of ent on the appropriate d on their | | | | | |
|--------------------|---|---|--|--|---|---|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | \checkmark | | | |
| Scoring Definition | Each project is reviewed allom region or spect from a peer-rev | scored on a netric equatio es, and 5 ind viewed study | 5-point scale from n was used that of icates that a spect was used. | n 1 to 5, where does not appe cies/region/fo | e 1 indicates th ar to be approp rest-type releva | at a non-peer priate for the ant equation | | |
| Scoring Approach | MSCI ESG Res carbon stock c | MSCI ESG Research identifies the specific allometric equation(s) a project uses in its carbon stock calculations. This specific study for the allometric equation is then | | | | | | |



researched to determine whether it was peer-reviewed and its relevance for the project's key characteristics.

Projects that use a peer-reviewed equation receive 2 points. Projects receive an additional point if their equation is relevant to each of the region, tree species and forest type.

2.2 Accuracy of Assumptions

The accuracy of key project quantification assumptions is evaluated against a combination of internal and third-party estimates to determine whether they appear reasonable.

There are four components that are used to evaluate this sub-criterion:

- **2.2.1 Carbon Stock Validation:** Whether the project's carbon stock assumptions appear accurate and reasonable over the project lifetime.
- 2.2.2 Conservativeness: Whether the project has conservatively excluded certain sources of carbon pools from its calculations.
- **2.2.3 Site Preparation Project Emissions:** Whether the project has appropriately accounted for any emissions caused by preparing the site for planting.
- **2.2.4 Leakage**: Whether the project appropriately accounts for and compensates for the threat of leakage.

Each of these criteria are evaluated on a 1 to 5 scale. 2.2.1 Carbon Stock Validation is weighted 70% and the remaining three factors are weighted 10% each.

2.2.1 Carbon Stock Validation

Carbon Stock Validation refers to whether the project's carbon removal estimates appear accurate and reasonable.

| Rationale | Estimation of the carbon stock within a project area is subject to calculation uncertainty. Estimating the change and growth in carbon stock is the key input for ARR projects to estimate the amount of carbon removals they have achieved. Projects that over-estimate their growth in carbon stock will therefore over-estimate their emission removal impact. | | | | | | | |
|--------------------|---|--|--|--|---|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | | \checkmark | | | | | | |
| Scoring Definition | Each project is estimates (onc 50% indicates t assumption and over double the | scored on a o e accounting hat the proje d 200% indica e project's ass | continuous % sca for uncertainty in ct's carbon stock ates that the proj sumption. | ale, where 100 ntervals) mato per hectare is ect's carbon s | % indicates tha ch the project's s only 50% of th tock per hecta | at our estimate, ne project's re may be | | |
| Scoring Approach | MSCI ESG Research extracts information on a project's assumptions for growth in carbon stock. As projects do not provide this in a standardized way, three main inputs are considered in the following order of priority: | | | | | | | |



- **Carbon Stock Estimates:** Project assumptions on the total or per-hectare carbon stock within the project area over time.
- **Project Removals:** Project's claimed amount of emission removals due to the project activities (before accounting for any baseline removals).
- **Project Issuances:** The number of credits that the project has issued since it started.

For projects that directly provide above-ground biomass estimates, these estimates are used. For projects that only provide total carbon stock estimates, including other carbon sources, either project assumptions on the mix of carbon sources or regionally specific default values are used to estimate the above-ground biomass component of a project's carbon stock.

The project estimated values are then compared to geospatial estimates, using thirdparty data from Chloris Geospatial.

Chloris Geospatial produces direct estimates of aboveground (AGB) stock and change and forest cover maps, including allocation of forest losses between stand replacement disturbances and forest degradation. The Chloris AGB stock product is a 30 m resolution direct estimation of live aboveground biomass produced by proprietary machine learning models. Chloris Geospatial incorporates remote-sensing measurements from spaceborne and airborne LiDAR, the United States Geological Survey's Landsat satellites, and other instruments. To capture spatial variability in ecological zones, vegetation types and structure, the Chloris models are trained at the continental/regional scale and capture biogeographic variation in both allometry and the relationship between aboveground biomass and remote sensing measurements. Chloris provide these estimates as an uncertainty range to reflect the inherent modelling uncertainties that exist, and their lower-bound uncertainty intervals is used to compare against project's estimates.

This is evaluated over the full project area, not just the plantation area, in order to identify situations where a project may plant trees in one area but offset these with harvesting in other sections of the project boundary.

Chloris' geospatial estimate (using the lower-bound uncertainty interval) is then compared to the project assumption to derive the % score based on this ratio difference. This % score is then converted into a numeric scale by assuming 100% equals a score of 5, 50% equals a score of 3, and anything over 200% equals a score of 7.

2.2.2 Conservativeness

Conservativeness relates to whether the project has excluded certain sources of carbon pools from its calculations.

RationaleThe carbon stock of a forested area comprises not only the trees that are visible above-
ground, but also below-ground biomass, soil organic carbon and other dead wood.
Deforestation and degradation can impact the carbon stored in each of these carbon
pools but is not always accounted for by projects. Projects that do not estimate the



carbon stock within certain pools, such as soil organic carbon, will estimate their emissions impact more conservatively than if they include all these pools in their calculations.

| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
|--------------------|---|---|--|---|--|--|--|--|--|
| | \checkmark | | | \checkmark | | | | | |
| Scoring Definition | Each project is pools were excl only biomass ca | scored on a s uded from a arbon pools v | scale of 3.25 to 5 project's calculat were included in a | , where 3.25 ir tions and 5 inc a project's car | ndicates no op dicates that, co bon stock calc | tional carbon onservatively, ulations. | | | |
| | MSCI ESG Research conducts a detailed review of each individual project's key documents to identify which carbon sources were included in its carbon stock calculation. The carbon sources reviewed include: above-ground biomass; below- ground biomass; dead wood; wood products; soil organic carbon and litter. | | | | | | | | |
| Scoring Approach | Given that each of these pools has different significance to the overall carbon stock, the proportion of the total carbon stock that any excluded pools likely represent is estimated based on analyzing a sample of similar projects. For example, soil organic carbon is on average 4x more important as a carbon source than dead wood or litter, so its exclusion is more conservative than the exclusion of dead wood or litter. | | | | | | | | |
| | All projects receive a score of at least 3.25 for including mandatory above-ground and below-ground biomass sources. Projects then receive an additional 1 point if they conservatively excluded soil organic carbon, and 0.75 points if they conservatively excluded ach of dead wood, litter and wood products. | | | | | | | | |

2.2.3 Site Preparation Project Emissions

Site Preparation Project Emissions refers to whether the project has appropriately accounted for any emissions caused during the preparation of its land for planting.

| Rationale | When preparing release carbon conduct site pr account for the | Vhen preparing land prior to planting, the site preparation activities involved may elease carbon into the atmosphere. Therefore, it is important that projects that conduct site preparation activities that risk creating project emissions appropriately account for these in their net emission calculations. | | | | | | | |
|--------------------|--|---|---|------------------------|---------------------|------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates no project emissions are accounted for despite material site preparation risk and 5 indicates that project preparation emissions are appropriately accounted for. | | | | | | | | |
| Scoring Approach | MSCI ESG Re documents to u date, including | MSCI ESG Research conducts a detailed review of each individual project's key documents to understand the type of site preparation conducted prior to the project start date, including the proportion of soil disturbed and the techniques used as part of this | | | | | | | |



(e.g., tillage). Based on the level and type of disturbance, a site preparation risk category is assigned to each project, which is then compared to whether any site preparation emissions were accounted for or not.

Projects that use a soil conservation protocol receive an additional point onto the scoring above to reach an overall score between 1 and 5.

2.2.4 Leakage

Leakage relates to whether the project appropriately accounts for and compensates for the threat of leakage.

| Rationale | Leakage can oc elsewhere. For consequently th then the net effe account for the threat of leakag still an importa | Leakage can occur when a project's activities cause an increase in emissions elsewhere. For example, agricultural land may be converted to a forested area, but if consequently this causes a forested area to be deforested for agricultural purposes, then the net effect will be zero. It is important that projects appropriately consider and account for the potential of leakage. Though academic studies have identified that the threat of leakage is lower in ARR projects than other project types, such as REDD+, it is still an important consideration. | | | | | | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | | | | | | | | |
| Scoring Definition | Each project is a made despite a accounted for. | Each project is scored on a scale of 3 to 5, where 3 indicates no leakage deduction is made despite a material leakage threat and 5 indicates that leakage is appropriately accounted for. | | | | | | | |
| | MSCI ESG Research conducts a detailed review of each individual project's key documents to understand what the previous land use was and whether any leakage consideration and deduction had been made. | | | | | | | | |
| Scoring Approach | The threat of leakage is generally higher where the land was previously used for human activities, such as timber harvesting or agriculture, which might be displaced elsewhere. The overall score is then based on both the previous land use and whether leakage had been considered. | | | | | | | | |
| | Academic literature has demonstrated that the effects and risks of leakage for ARR projects are generally significantly lower than for other nature-based projects (such as REDD+). Hence, the minimum score ARR projects can achieve for this sub-criterion is a 3. | | | | | | | | |

2.3 Monitoring Performance

The frequency and accuracy of the project's monitoring plan is important to ensure carbon stock is increasing as expected throughout the crediting period. Project data is compared to relevant literature to determine whether the monitoring performance appears reasonable.

There are two components that are used to evaluate this sub-criterion:



- **2.3.1 Monitoring:** Whether the monitoring techniques and monitoring frequency appears reasonable.
- **2.3.2 Mortality and Survival Rates:** Whether the project monitors and provides details of mortality and survival rates.

Each of these criteria are evaluated on a 1 to 5 scale. **2.3.1 Monitoring** and **2.3.2 Mortality and Survival Rates** are weighted 50% each.

2.3.1 Monitoring

Monitoring relates to whether the project frequently monitors carbon stock and if the techniques used are appropriate and will provide accurate measurements.

| Rationale | As tree growth may vary over time, it is important to ensure this is monitored throughout the project activity to ensure any changes in carbon stock are accounted for. Therefore, a project regularly monitoring its carbon stock will provide a more accurate account of t CO ₂ sequestered over time. This can also be supported by the quality of monitoring technique used. A more effective monitoring plan will ensure monitoring occurs annually and includes field measurement and remote sensing data to accurately estimate carbon stock changes. | | | | | | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | | | | | \checkmark | | | |
| Scoring Definition | Each project is scored on a 5-point scale from 1 to 5, where 1 indicates monitoring every five years and does not use field measurements or remote sensing and lacks transparency regarding monitoring reports. Where 5 indicates regular monitoring is completed by the project using remote sensing and field measurements, and monitoring reports are made publicly available. | | | | | | | |
| Scoring Approach | MSCI ESG Rese monitoring tech | MSCI ESG Research assesses the frequency of carbon stock monitoring and monitoring techniques used from each project's documentation. | | | | | | |

2.3.2 Mortality and Survival Rates

Mortality and survival rates are key elements to monitor throughout an ARR project to ensure the project is performing as expected and, if not, then this is being considered in quantifying carbon stock.

| Rationale | The size of a p it faces. Projec facing high lea | The size of a project's leakage deduction should reflect the specific leakage threat level it faces. Projects that deduct a low proportion of their credits due to leakage despite facing high leakage threats risk overestimating their total emissions reduction impact. | | | | | | | |
|--------------------|--|--|---|-----------------------------------|----------------------------------|------------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| Scoring Definition | Each project is of mortality or | scored on a survival rates | 5-point scale fror has been found | n 1 to 5, where within project | e 1 indicates no documentatio | o disclosure n, and it is | | | |



therefore unclear if it has been incorporated in carbon stock calculations. A score of 5
indicates mortality or survival rates are monitored over time and are used to determine
carbon stock.MSCI ESG Research extracts mortality and survival rates from project documentation,
in particular, in a project's monitoring reports to assess whether projects regularly
monitor their mortality and survival rates.Scoring ApproachProjects that do not provide any information on the number of trees, mortality rates or
survival rates receive a score of 1. Projects that do track at least one of these metrics
through successive monitoring reports receive a score of 5.
For projects that have not completed their first monitoring period, this sub-criterion is
not scored.



7. Criterion 3 - Permanence

Permanence refers to the likelihood that the emission reductions or removals achieved by a project will be sufficiently long-term and not released back into the atmosphere. There is growing consensus that 100 years represents a good benchmark for projects to be classified as "permanent." The IC-VCM's Core Carbon Principles require a monitoring and compensation period of at least 40 years for nature-based projects.

A permanent reduction or removal can only be guaranteed where it is physically impossible for a reversal to occur. However, for most projects, a risk of reversal does, to some extent, exist. This risk may be due to natural risks, such as wildfires, or human risks, such as poor project management.

ARR projects involve permanence risks in both successfully establishing a forest and in maintaining and protecting it once grown. In the early stages of a project, as trees grow and forest cover increases, it is imperative that projects undertake planting strategies to ensure planted trees survive. When significant forest cover is established, ARR projects involve both inherent human and natural permanence risks in protecting the area. For example, on the latter, protected forests may be later destroyed by wildfires or other natural disasters. The significance of this permanence risk depends on both the level of natural and human risks, and the extent to which these have been mitigated by the project's activities. This net risk must then becompensated for in the project's crediting methodology.

Figure 9: Permanence integrity assessment approach illustrates the sub-criteria through which MSCI ESG Research assesses the permanence of the emissions reductions achieved by ARR projects, and the Integrity Assessment framework sub-criteria that they refer to. The detailed sub-criteria are described in Figure 10.







⁸ The approach to assess 3.2.2 Local Stakeholder Engagement is outlined in Section 4.3.2, Local stakeholder engagement.



Figure 10: MSCI Permanence integrity assessment framework

| Sub-criteria Metrics Rationale | | | | | Renewables | ARR | Cookstoves | Biochar | Landfill Gas | Safe Water | IFM | Waste Mgmt. | Blue Carbon |
|---|-------------------------------|---|---|-------------------------|-------------------------|-----|------------|---------|--------------|------------|-----|-------------|-------------|
| Permanence | 3.1.1 Project Type Risk | Project Type Significance | ✓ Standardized approach | | | | | | | | | | |
| of Non- Risk | 3.1.2 | 3.1.2.1 Natural Risks | The risk of fire, drought, landslide and other natural risks in that project area. | ~ | | ~ | | | | | ~ | | ~ |
| 3.1 Level | Project Risk | 3.1.2.2 Human Risks Human-related permanence risks include the strength of land tenure rights or a project developer's experience. | | | | ~ | | | | | * | | ~ |
| 3.2.1 Mitigation Activities 3.2 Mitigation 3.2.2 Local Stakeholder Engagement | | 3.2.1 Mitigation Activities | rojects can mitigate non-permanence risks rough implementing activities that focus n addressing key risks. | | | ~ | ~ | ~ | | ~ | ~ | | ~ |
| | | 3.2.2 Local Stakeholder Engagement | Successfully engaging with local stakeholders lowers the risk of human-based non-permanence. | | | ~ | ~ | ~ | | ~ | ~ | | ~ |
| | | 3.3.1 Project Contributions | A project's buffer pool contributions should appropriately account for the non- permanence risk. | ~ | | ~ | ~ | ~ | | ~ | ~ | | ~ |
| 3.3 Com and | pensation | 3.3.2 Buffer Pool Capitalization | An under-capitalized buffer pool may have insufficient credits to cover future losses. | ✓ Standardized approach | | | | | | | | | |
| Contributions 3.3.3 Buffer Pool Mechanics | | 3.3.3 Buffer Pool Mechanics | A buffer pool should have mechanisms in place to ensure projects appropriately account for and estimate their buffer pool credits. | | ✓ Standardized approach | | | | | | | | |
| 3.4 E Non- Perm | vidence of nanence | Non-Permanence Events | If significant reversals have occurred without being accounted for, then carbon stock reversals have already occurred. | ~ | | ~ | | | | | ~ | | |
| 3.5 Red and Review of academic papers, industry sources and the news for Red or Green Flags relating to project's permanence. | | | | ✓ Standardized approach | | | | | | | | | |

3.1.2.1 Natural Risks

Natural risks refer to the significance and likelihood that such risks within a project area might lead to a reversal in the emission reductions/removals achieved.

Natural disturbances, such as drought, fire or landslides, can threaten the CO2e stored
in land-based carbon pools. These risks are most relevant for nature-based projects,
where the CO2e is stored in carbon pools that are susceptible to a range of natural
risks. For example, wildfires may burn down trees within an ARR project, resulting in
CO2 being released into the atmosphere.



| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | MSCI Carbon Markets | | |
|--------------------|--|--------------|---|------------------------|------------------------|--|--|
| | | \checkmark | | | \checkmark | | |
| Scoring Definition | Each project is scored on a 5-point scale from 1 to 5 for each natural risk type, where 5 indicates no permanence risk and 1 indicates a very significant permanence risk. | | | | | | |
| | MSCI ESG Research considers five main types of natural risk in our assessment: (ii) drought, (iii) landslide; (iv) windthrow/tropical cyclone (or uprooting of trees by wind); (v) biotic. These risks are assessed independently using MSCI ESG Research geospatial analysis. MSCI ESG Research only assesses natural risks where they are relevant to that protype. For many types, natural risks do not represent a permanence risk as the CO₂ not stored in a carbon pool at risk of natural disturbances. | | | | | | |
| Scoring Approach | Major natural risks are assessed for each individual project through geospatial analysis of its boundary, as shown in Table 1 . For each risk, MSCI ESG Research looks at the historical trends and patterns of natural risk. Then, these risks are forecast using our in-house climate models that account for the projected change in likelihood as temperatures and climates change. This modelling results in a specific estimate of risk within that project boundary. | | | | | | |
| | More detail on MSCI ESG Research's geospatial permanence methodology can be found in separate methodology note: "MSCI Carbon Project Ratings - Geospatial Methods in Assessing Permanence" | | | | | | |

Table 1: Analytical approach for each natural risk

| | Wildfire | Forecast s the future frequency and severity of fires based on a geospatial analysis and our own modelling. | | | |
|---------------|-----------|--|--|--|--|
| | Drought | Forecasts the intensity and frequency of drought risk for each project. | | | |
| Natural Risks | Landslide | Assesses the percentage of project areas that are currently susceptible to landslides based on the NASA landslide susceptibility map. ⁹ | | | |
| | Windthrow | Estimates the tropical cyclone return interval for each project area based on a 10,000-year synthetic dataset. | | | |
| | Biotic | Assesses biotic outbreaks (% of area at risk/not at risk), based on the National Insect and Disease Risk Map (NIDRM) 2018. ¹⁰ | | | |

⁹ Thomas Stanley and Dalia B. Kirschbaum, "A Heuristic Approach to Global Landslide Susceptibility Mapping," *Natural Hazards*, 87.1 (2017), 145–64, https://doi.org/10.1007/s11069-017-2757-y, 2017.

¹⁰ US Forest Service, "National Insect and Disease Risk Map (2018 NIDRM)," 2018.



3.1.2.2 Human Risks

Protected forests are also subject to human-based risks of reversal, given that the areas may be deforested at a later date. If an ARR project successfully grows an area for 20 years, but the area is then deforested anyway, the project's emissions impact will only be transitory. While even a transitory reduction is helpful in providing the climate some short-term "relief," it is less valuable than a more permanent reduction/removal, and cannot be said to be a "true" offset of a fossil fuel emission (which stays in the atmosphere for a very long time).

In order to assess human-based permanence risks, one must consider the different underlying drivers of human-based deforestation. As part of this assessment, three primary components of human risk are analyzed:

- **3.1.2.2.1 Land Tenure:** Whether disputable or unsecure land tenure may impact the stability of the project area's governance and protection.
- **3.1.2.2.2 Crediting Period**: Whether plans are in place to protect the forest beyond the project lifetime to ensure ongoing protection of the area.
- 3.1.2.2.3 Opportunity Cost: Whether a deforestation-linked alternative land use represents a high opportunity cost of the project activities and therefore may incentivize deforestation in the future.

3.1.2.2.1 Land Tenure

Land Tenure refers to whether any land tenure issues or uncertainties exist in the project area which impact the potential for deforestation in the future.

| Rationale | Project areas th threat of comm deforestation fu project area. | Project areas that have secure land tenure are less prone to illegal settlements or the threat of communities being removed from their land. In this way, agents of deforestation from outside the project area are less likely to inhabit and control the project area. | | | | | | | |
|--------------------|---|---|--|---|--|---|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | | | \checkmark | \checkmark | | | | |
| Scoring Definition | Each project is and 5 indicates agents of defor | Each project is scored on a scale of 1 to 5, where 1 indicates very high land tenure risks and 5 indicates very secure and stable land tenure with low risk of being seized by agents of deforestation. | | | | | | | |
| | MSCI ESG Research conducts a detailed review of each individual project's docu to identify the security and strength of land tenure rights and the existence of ar current or historic land disputes. This is then combined with third-party data on regional stability of property and land rights. | | | | | | | | |
| Scoring Approach | First, the stabili area existed is of 5. While proj | ity and securi considered. F ects with inse | ty of land tenure Projects with very ecure land rights | and whether a / secure and s and known di | any disputes fo table rights rec sputes received | r the project eived a score d a score of 1. | | | |
| | Second, the security of property and land rights within the relevant region is assessed using third party data from the World Economic Forum and World Bank. For larger | | | | | | | | |



countries, such as Brazil, regional state-level data is used. Each area was scored on a 1 to 5 scale based on the stability of property rights and land rights recognition.

The overall project score is based on a straight average of these two scores.

3.1.2.2.2 Crediting Period Impact

Crediting Period Impact relates to whether plans are in place to protect the forest beyond the project lifetime to ensure ongoing protection of the area.

| Rationale | An ARR project may have a lifetime of 30 years, beyond which the project proponents may not be obligated to protect the area. Particularly for ARR projects run by timber companies, it is crucial that the crediting period extends beyond the normal harvesting cycle practiced by the project developer. The risk of abandonment of the project activities are heightened after the end of this project lifetime. In contrast, projects that legally commit to preserving the area beyond the project's lifetime reduce this risk. | | | | | | | |
|--------------------|--|---------------------------------|--|----------------------------------|-------------------------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | \checkmark | | |
| Scoring Definition | Each project is a abandonment a period. | scored on a s Ind 5 indicate | scale of 1 to 5, wh as very limited ris | nere 1 indicate k of abandoni | es very high ris ment within a 1 | k of 00-year | | |
| Scoring Approach | MSCI ESG Research identifies the project lifetime and whether any commitments exist beyond this to protect the area. Further, the drivers of deforestation are also considered, as projects in which the agents of deforestation are the project participants may have higher abandonment risk after the crediting period ends. For example, planned deforestation projects with 30-year crediting periods may simply deforest the area at the end of this period. The total score is therefore determined through a consideration of both the length of | | | | | | | |

3.1.2.2.3 Opportunity Cost

Opportunity Cost refers to whether a deforestation-linked activity represents a very attractive alternative land use compared to the project scenario.

| Rationale | If an alternative land use represents a significantly more attractive activity for the community compared to the project's activities, then agents of deforestation may be incentivized to deforest the area rather than grow and protect it. | | | | | | |
|-------------|---|------------|---|------------------------|---------------------|------------------------|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | | | |



| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates a very high opportunity cost seems to exist and 5 indicates that forest protection appears relatively attractive. |
|--------------------|---|
| | MSCI ESG Research conducts a detailed review of each individual project's documents, including its project design document and non-permanence risk reports, to understand the financial attractiveness of alternative land uses compared to the project scenario. |
| Scoring Approach | Based on the relative financial attractiveness of this alternative land use compared to the project scenario, projects are scored on a 1 to 5 scale. |
| | For example, if the most profitable land use would have been 100% or more financially attractive compared to the project scenario then the project receives a score of 1. |

3.2.1 Mitigation Activities

Projects can mitigate both natural and human-based permanence risks through their project design and implementation. Though it is not possible for project developers to completely eliminate risks of reversals which lie outside of their control, risks can be reduced and contained through careful project design.

In order to assess the effectiveness of mitigation activities, one must consider the full spectrum of activities that affect the underlying natural or human-based drivers of permanence risk.

As part of this assessment, four primary components of mitigation are analyzed:

- **3.2.1.1 Ecosystem Diversity and Resilience:** Whether the project's planting strategy supports a biodiverse and resilient ecosystem within the project area.
- **3.2.1.2 Fire and Disease Prevention**: Whether the project has explicitly implemented activities to prevent and monitor for fire and diseases.
- **3.2.1.3 Tree Monitoring and Replanting:** Whether the project monitors tree health and engages in replanting activities to support higher total survival rates.
- 3.2.1.4 Alternative Livelihoods: Whether the project creates sustainable and attractive alternative livelihoods for communities that incentivize the continuation of the project's activity and forest maintenance.
- **3.2.1.5 Ownership and Management:** Whether the project's owners and managers have a track record of successfully running similar projects.

Each of these sub-criteria are assessed on a 1-5 scale. The overall score is reached by weighting each of these sub-criteria equally.

3.1.2.1 Ecosystem Diversity and Resilience

Ecosystem Diversity and Resilience refers to whether the project's planting strategy supports a biodiverse and resilient ecosystem within the project area.

RationaleThe types and variety of tree species planted play a critical role in the long-term
sustainability of a new forest. Planting tree species that are native and highly suited to
the project area not only improves the biodiversity potential of the project, but also
increases the resilience of the forest. This resilience therefore increases the forest's
ability to react to and cope with natural permanence risks.



| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
|--------------------|---|---|---|------------------------|-------------------------|------------------------|--|--|--|
| | | | | | | | | | |
| Scoring Definition | Each project is planted a mono planted a divers threatened spe | Each project is scored on a scale of 1 to 5, where 1 indicates that the project has planted a monoculture of non-native tree species, and 5 indicates that the project has planted a diverse mix of native tree species are designed to support a wide range of threatened species. | | | | | | | |
| | This sub-criteri Biodiversity. | on is assess | ed in the same wa | ay as sub-crite | eria 4.1.3.4.2 P | lanting | | | |
| Scoring Approach | Key project doo planted as part based on the e third party data | Key project documents are assessed to identify the number and types of tree species planted as part of the project's activities. These tree species are then categorized based on the extent to which they are native to the project area using a combination of third party data. | | | | | | | |
| | Projects are then scored based on both the types and range of tree species planted. | | | | | | | | |

3.2.1.2 Fire and Disease Prevention

Fire and Disease Prevention relates to whether the project has explicitly implemented activities to prevent and monitor for fire and diseases.

| Rationale | By implementin projects can rec | By implementing monitoring techniques or prevention strategies, such as fire breaks, projects can reduce both the severity and likelihood of nature-based reversal risks. | | | | | | | | |
|--------------------|---|--|---|------------------------|---------------------|------------------------|--|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | | |
| | | | | | | | | | | |
| Scoring Definition | Each project is explicit fire or d both clear fire a | Each project is scored on a scale of 1 to 5, where 1 indicates that the project has no explicit fire or disease prevention activities in place, and 5 indicates that the project has both clear fire and disease prevention activities in place. | | | | | | | | |
| | MSCI ESG Research reviews a project's documents to identify whether it has implemented any activities related to the monitoring or mitigating of fire and/or disease risk. | | | | | | | | | |
| Scoring Approach | Projects are then scored based on the presence of these activities. Projects that implemented both fire and pest/disease prevention strategies received a score of 5. Projects that implemented one of these strategies received a score of 3. Projects that implemented neither received a score of 1. | | | | | | | | | |

3.2.1.3 Tree Monitoring and Replanting

Tree Monitoring and Replanting refers to whether the project monitors tree health and engages in replanting activities to support higher total survival rates.



| Rationale | Planted trees m sequestration p monitoring and trees will surviv | Planted trees may not live to reach full maturity and therefore their full carbon sequestration potential. Through their initial planting strategy, and post-planting monitoring and replanting activities, projects can improve the likelihood that planted trees will survive. | | | | | | | |
|---|---|--|---|----------------------------|---------------------|------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | | | | | | | | |
| Scoring Definition | Each project is trees using an u replant lost tree mechanisms in | Each project is scored on a scale of 1 to 5, where 1 indicates that the project plants trees using an unsuitable planting density that increases mortality risk and does not replant lost trees, while 5 indicates that the project has a suitable planting density and mechanisms in place to monitor mortality rates and replant lost trees. | | | | | | | |
| | MSCI ESG Rese strategy, and ac | earch reviews ctivities to mo | a project's docu onitor and replan | ments to undents to undent | erstand its initi | al planting | | | |
| Scoring Approach | The planting density and spacing of projects is then benchmarked against similar projects. Projects that used a suitable planting density in line with comparable projects received 3 points. Projects that used a very high planting density received 1 point. | | | | | | | | |
| | Projects that be received an add | Projects that both monitored tree mortality/survival rates and replaced lost trees received an additional 2 points. | | | | | | | |
| These points were then summed up to reach the overall score out of 5. | | | | | | | | | |

3.2.1.4 Alternative Livelihoods

Alternative Livelihoods relates to whether the project creates sustainable and attractive alternative livelihoods for communities that incentivize the continuation of the project's activity and forest maintenance.

| Rationale | Projects that create sustainable and attractive economic opportunities for local communities increase the likelihood that those communities will be incentivized to continue with the project's activities beyond the project lifetime. | | | | | | | |
|--------------------|--|------------|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that the project does not support an attractive alternative livelihood for local communities compared to the baseline scenario, and 5 indicates that very attractive alternative livelihoods are supported. | | | | | | | |
| Scoring Approach | The score for this sub-criterion is based on the score for 4.1.3.1 Alternative Livelihoods , which includes a detailed review of the net impact of the project on the social and economic wellbeing of local communities. | | | | | | | |



3.2.1.5 Ownership and Management

Ownership and Management refers to whether the project's owners and managers have a track record of successfully running similar projects.

| Rationale | Project develop have both lowe | roject developers with significant experience in successfully running similar projects ave both lower execution risk and lower risk of abandonment. | | | | | | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | | | | | | | | | |
| Scoring Definition | Each project is does not have of and 5 indicates ARR project des | ach project is scored on a scale of 1 to 5, where 1 indicates that the project developer oes not have or does not appear to have any experience in running similar projects, nd 5 indicates that the project developer appears to have significant experience in .RR project design and implementation. | | | | | | | |
| | Leveraging MSCI Carbon Market's datasets on over 10,000 voluntary carbon market projects, the experience of project proponents with similar projects is assessed. | | | | | | | | |
| | Project documentation is also reviewed to understand if the management had an adaptive management plan in place. | | | | | | | | |
| Scoring Approach | Projects are sco have previous e previous experi of 2. Projects w received a scor | s are scored on a three-point scale from 1 to 5. Projects run by developers the evious experience received a score of 5. Projects run by developers without s experience but with an adaptive management plan in place received a sco ojects without both previous experience and an adaptive management plan d a score of 1. | | | | | | | |



8. Criterion 4 – Co-benefits

Co-benefits reflect the sustainable development benefits (and safeguards) of a project beyond the CO₂e it saves, in other words, its "externalities." These are typically positive but can, on occasion, be negative.

Carbon projects have the potential to reduce/remove CO₂e, and simultaneously have a broader positive societal impact via issues such as development, adaptation, and biodiversity.

ARR projects have the potential to deliver significant social and environmental outcomes in addition to their emissions impact. Through planting and maintaining trees, ARR projects can create forested areas that support and enrich wildlife habitats and soil health, though this impact is highly dependent on the suitability and diversity of tree species planted. ARR projects can also support social development goals through community development initiatives that promote economic, health or diversity outcomes within the community that lives in or around the project area.

MSCI ESG Research's approach to co-benefit assessment builds on the UN's Sustainable Development Goals (SDG) framework. We focus on understanding both the SDG significance of a project and the extent to which the project provides evidence of these outcomes being achieved through effective monitoring.

Figure 11 illustrates the sub-criteria through which MSCI ESG Research assesses the co-benefits of ARR projects, and the Integrity Assessment framework sub-criteria that they refer to. The detailed sub-criteria are described in **Figure 12**.









Figure 12: MSCI Co-benefits integrity assessment framework

| Sub | -criteria | Metrics | Rationale | REDD+ | Renewables | ARR | Cookstoves | Biochar | Landfill Gas | Safe Water | IFM | Waste Mgmt. | Blue Carbon |
|----------------|-------------------------------|--|---|-----------------------------------|-------------------------|-----|------------|----------------|--------------|------------|-----|-------------|-------------|
| ě | 4.1.1 Project | 4.1.1.1 Relevance to Project Type | Different project types have an inherently different impact on each sustainable development impact. | | ✓ Standardized approach | | | | | | | | |
| efits Relevand | Type Relevance | 4.1.1.2 Contribution to Net Zero | Some project types create "carbon lock-ins" of technologies or practices that are not compatible with a net zero economy. | ✓ Standardized approach | | | | | | | | | |
| 4.1 Co-ben | 4.1.2 Project | 4.1.2.1 Project Intentions to Activities | The specific design and implementation of a project's activities are critical drivers for whether a project generates positive sustainable development impact. | * * * * * * * | | | ~ | ~ | ~ | ~ | | | |
| Relevance | 4.1.2.2 Biodiversity Value | Nature-based projects that enhance or protect areas of rich biodiversity have greater environmental value. | ~ | | ~ | | | | | ~ | | ~ | |
| 4.2.1 Certifi | | 4.2.1 Certification | Achieving certification involves more stringent project verification. This improves the likelihood that a project's co-benefits have been realized. | oves s ✓ Standardized approach | | | | | | | | | |
| Evid | ence | 4.2.2 Quantification of Outcomes | Projects can increase the confidence that co-benefits are attributed to their actions through measuring, monitoring, and quantifying the outcome. | ~ | | ~ | ~ | ~ | | ~ | ~ | | ~ |
| 4 2 Sofoguarda | | 4.3.1 Registry Safeguards | More effective environmental and social safeguards required by registries reduce the likelihood of projects causing harm. | ✓ Standardized approach | | | | | | | | | |
| | | 4.3.2 Local Stakeholder Engagement | Projects that successfully engage with local stakeholders reduce the likelihood of any negative impacts occurring. | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ | ~ |
| 4.4 Gree | Red and en Flags | News scanning | Review of academic papers, industry sources and the news for Red or Green Flags relating to project's co-benefits. | y yen ✓ Stand s. | | | dardiz | lized approach | | | | | |

4.1.2.1 Project Intentions to Activities

While ARR projects can impact a range of social or environmental goals, the significance of these cobenefits is heavily determined by the project's design and implementation. A detailed understanding of a project's activities and design is hence required in order to fully assess its co-benefit impact.

There are four categories of sustainable development impacts that are evaluated as part of this subcriterion:

- **4.1.3.1 Alternative Livelihoods:** Whether the project provides a superior alternative livelihood to stakeholders beyond that which would have been achieved with the previous land use.
- **4.1.3.2 Diversity and Inclusion**: Whether the project promotes and drives increased diversity and inclusion within the project area, supporting the needs of any disadvantaged groups.
- **4.1.3.3 Education and Infrastructure:** Whether the project supports and invests in local education, health, and infrastructure.
- **4.1.3.4 Biodiversity:** Whether the project protects an area of high biodiversity value, supporting continued ecosystem value and resilience.

Each project is scored on a scale of 1 to 5 based on the evaluation of these metrics. The first three are each weighted 20%, and Biodiversity is weighted as 40%. Biodiversity is weighted slightly higher given its direct relevance to all ARR projects, and the fact that the other three criteria do not apply to ARR projects based in remote regions.

4.1.3.1 Alternative Livelihoods

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When ARR projects start the process of converting a project area into forested land, they are also impacting the economic opportunities that are available to local communities through using this land. For example, local communities may have relied on the land for agricultural purposes, and therefore ARR projects must ensure that they are promoting alternative livelihoods that still provide equal or greater benefits to any impacted local communities. If project activities do not sufficiently compensate communities, then the households may suffer a reduction in their incomes compared to what would have otherwise happened (and may then disrupt the project activities, by, for example, deforesting the replanted land).

An assessment of Alternative Livelihoods therefore requires both understanding the opportunity cost of a project and the project's support mechanisms that aim to substitute for this opportunity cost:

- **4.1.3.1.1 Alternative Livelihoods Risk**: The extent to which the baseline scenario would have created high financial outcomes for local communities.
- **4.1.3.1.2 Alternative Livelihoods Support**: Whether the project provides attractive and sustainable opportunities and support to local communities.

Both sub-criteria are assessed on a scale of 1 to 5, with the overall score reached by weighting these two factors 25% and 75% respectively.

4.1.3.1.1 Alternative Livelihoods Risk

To assess alternative livelihood risk, two factors are considered related to a project's opportunity cost:

- **4.1.3.1.1.1 Opportunity Cost:** Whether an alternative land use represents a financially very attractive scenario for project participants.
- **4.1.3.1.1.2 Previous Land Use Risk:** Whether the prior land use and baseline land type supported local community livelihoods through economic activities.

These criteria are assessed on a scale of 1 to 5, where 1 represents high risk and 5 represents low risk. The overall score for 4.1.3.1.1 Alternative Livelihoods Risk is then reached by weighting these two factors 60% and 40% respectively.



4.1.3.1.1.1 Opportunity Cost

Opportunity cost refers to whether the most profitable alternative land use is significantly more attractive financially than the project scenario.

| Rationale | The extent to which projects' activities impact the financial opportunities and support for local communities is determined by the other ways the land could have been used. If this alternative land use would have delivered high financial benefits to local communities, then the risk that the project leads to lower community support and incomes is higher. | | | | | | | |
|--------------------|---|---------------------------------|--|----------------------------------|--------------------------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is opportunity cos | scored on a s st and 5 indic | scale of 1 to 5, wl ates that the opp | here 1 indicate ortunity cost | es that there is risk is very low | a very high | | |
| | MSCI ESG Research assesses the financial attractiveness of alternative land uses for the project area. | | | | | | | |
| Scoring Approach | Based on the relative size of the most profitable land use compared to the project scenario, projects are categorized on a 1 to 5 scale. For example, if the most profitable land use would have been 100% or more financially attractive compared to the project scenario, then the project receives a score of 1. | | | | | | | |

4.1.3.1.1.2 Previous Land Use Risk

Previous Land Use Risk relates to whether the previous or baseline land use supported local community livelihoods through agricultural or harvesting activities.

| Rationale | If the previous or baseline land use of the project area would have provided financial opportunities and support to local communities, then the financial opportunity cost of removing this activity is higher. | | | | | | | |
|--------------------|--|--|---|---|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | | | | | | | | |
| Scoring Definition | Each project is livelihood risk a | Each project is scored on a scale of 1 to 5, where 1 indicates very high alternative livelihood risk and 5 indicates very low alternative livelihood risk. | | | | | | |
| | MSCI ESG Rese project and ass | earch conduc sessed the rel | ts a review of the evance of these | review of the previous and baseline land use for the nce of these to alternative livelihood risk. | | | | |
| Scoring Approach | Each land use type is scored based on the risk to local communities' alternative livelihoods. For example, if the baseline land use is small-scale agriculture, then this represents a very high risk for alternative livelihoods. If the prior land use was barren land without any commercial activities, then the alternative livelihoods risk is lower. | | | | | | | |



The baseline and previous land use types for each project is then combined with their relevance to alternative livelihoods risk to reach an overall score.

4.1.3.1.2 Alternative Livelihoods Support

To assess the extent to which a project supports its local community's financial opportunities, four factors are considered:

- **4.1.3.1.2.1 Target SDGs:** Whether a project targets specific sustainable development goals related to the employment and financial opportunities for local communities.
- **4.1.3.1.2.2 Overall Support Initiatives:** The extent to which a project's activities involve support initiatives directly aimed at alternative livelihoods.
- **4.1.3.1.2.3 Benefit Sharing:** The extent to which a project shares the proceeds of its revenue from carbon credits directly with local communities.
- 4.1.3.1.2.4 Job Creation: Whether a project creates quantified employment outcomes.

These criteria are assessed on a scale of 1 to 5. The overall score is based on a weighting of these factors, with 5% weighting to 4.1.3.1.2.1 Target SDGs, 15% to 4.1.3.1.2.2 Overall Support Initiatives, 30% to 4.1.3.1.2.3 Benefit Sharing and 50% to 4.1.3.1.2.4 Job Creation.

4.1.3.1.2.1 Target SDGs

Whether the project targets specific sustainable development goals that relate to alternative livelihood opportunities.

| Rationale | Explicitly targeting certain development goals increases the chance that these goals and impacts will be emphasized and focused on by the project. That chance is further increased by the need to complete SDG goal verification process during a project's registration process. | | | | | | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is sustainable dev sustainable dev | Each project is scored on a scale of 1 to 5, where 1 indicates that no relevant sustainable development goals have been targeted and 5 indicates that three sustainable development goals relevant to alternative livelihoods have been targeted. | | | | | | |
| Scoring Approach | MSCI ESG Research assesses whether the project has targeted either directly or indirectly sustainable development goal 1 (No Poverty), 2 (Zero Hunger) or 8 (Dece Work and Economic Growth). For projects that do not use SDGs, all the sustainable development impacts mentioned by the project (such as employment and job opportunities) are identified. | | | | | | | |
| | Projects are then scored on a 4-point scale based on the number of relevant targeted SDGs either explicitly or implicitly mentioned. | | | | | | | |



4.1.3.1.2.2 Overall Support Initiatives

Whether alternative livelihood support represents a clear and central part of the project.

| Rationale | The extent to which the project's design and activities involve and focus on supporting alternative livelihoods indicate how relevant and significant that support is likely to be. | | | | | | | |
|--------------------|---|---|---|---|--|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Third-party Literature Data | | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is activities seem livelihood activ | Each project is scored on a scale of 1 to 5, where 1 indicates that alternative livelihood activities seem to be limited to patrolling jobs, while 5 indicates that alternative livelihood activities appear to be a central part of the project. | | | | | | |
| Scoring Approach | MSCI ESG Research conducts a detailed review of key project documents to build up a detailed view of a project's activities. All of the activities that supported the development of alternative livelihoods are then identified, with the project scored based on the range and depth of these activities. | | | | | | | |

4.1.3.1.2.3 Benefit Sharing

Whether the project transparently shares the proceeds of carbon credit revenues with local communities.

| Rationale | The proceeds c communities to | of carbon cree o ensure that | dit revenues can they financially b | sometimes be enefit from th | e directly share e project. | d with local | | | |
|--|---|---------------------------------|---|--------------------------------|--|--|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that no benefit sharing appears to be in place and 5 indicates that transparent benefit sharing agreements, within which a significant proportion of proceeds are delivered to local communities rather than to larger institutions (e.g., private companies or international charities) or governments. | | | | | | | | |
| | MSCI ESG Research assesses the use of proceeds of carbon credits, and whether benefit sharing agreements were in place. | | | | | | | | |
| Sooring Approach | Both the significance and transparency of benefit sharing agreements are assessed, and whether cash payments were provided by organizations with a transparent governance structure. | | | | | | | | |
| Scoring Approach Projects receive up to 3 points based on the presence and transparenc sharing agreements, and up to 2 points based on the presence of cash governance of these payments. Therefore, in total, projects that ha benefit sharing agreements including direct cash payments and a relia structure to manage these receive the maximum 5 points. | | | | | transparency c ence of cash p ects that have s and a reliable | of any benefit ayments and e transparent e governance | | | |



4.1.3.1.2.4 Job Creation

Job creation relates to whether the project creates quantified employment for local communities.

| Rationale | Project activitie and therefore c | oject activities can directly provide employment opportunities to local communities, ad therefore contribute to sustainable alternative livelihoods. | | | | | | | |
|--------------------|--|---|---|---|---|-------------------------|--|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | | |
| | \checkmark | | | | | | | | |
| Scoring Definition | Each project is opportunities a are likely to hav | scored on a s opear to have e been create | scale of 1 to 5, wh been created ar ed (relative to the | here 1 indicate nd 5 indicates e volume of cr | es that no emp that a high nui edits issued). | loyment nber of jobs | | | |
| | permanence and number of employment opportunities created by a project. Projects are scored on a 1 to 5 scale separately on both the number of employment opportunities created and the type and permanence of those opportunities. The number of employment opportunities is weighted 60% and type and permanence of employment opportunities 40% to reach the overall score. | | | | | | | | |
| | Number of Employment Opportunities | | | | | | | | |
| | For job creation, the total number of jobs is divided by the project's estimated annual emission reductions to assess the job creation on a relative basis. | | | | | | | | |
| Scoring Approach | This ratio of job creation per credit is categorized into a 1 to 5 score, where 5 indicates that over 5 jobs were created per 1,000 t CO_2 credits. This same scoring system for jobs created per kiloton (kt) CO_2 e is used across all project types to ensure consistency. | | | | | | | | |
| | Type and Perma | anence of Jo | b Opportunities | | | | | | |
| | The types and permanence of the jobs created by the project are analyzed. The types of jobs evaluated included planting, monitoring, harvesting, management, ecotourism, site preparation and maintenance jobs. The score for Type and Permanence of Job Opportunities was then based on both of these inputs. | | | | | | | | |

4.1.3.2 Diversity and Inclusion

ARR projects are regularly located in rural, less developed communities in which inequality may be high and certain parts of the population disadvantaged. For example, women may hold limited governance power and have low participation in community activities. ARR projects can help improve diversity and inclusion in the surrounding area by directly including and promoting the outcomes of disadvantaged groups.

To assess a project's impact on diversity and inclusion, three sub-criteria are considered:

- **4.1.3.2.1 Target SDGs:** Whether a project targets specific sustainable development goals related to diversity and inclusion.

- **4.1.3.2.2 Zero Employment Discrimination**: Whether a project explicitly practices zero employment discrimination within their operations.
- **4.1.3.2.3 Female Empowerment:** Whether a project supports more equal gender outcomes through active and representative inclusion of women in project activities.

Each of these sub-criteria is assessed on a scale of 1 to 5, with the overall score based on a weighting of each. 4.1.3.2.2 Zero Employment Discrimination is weighted 35%, 4.1.3.2.3 Female Empowerment is weighted 60% and 4.1.3.2.1 Target SDGs is weighted 5%.

4.1.3.2.1 Target SDGs

MSCI

Target SDGs refers to whether the project explicitly targets sustainable development goals (SDGs) related to diversity and inclusion.

| Rationale | Explicitly targeting certain development goals increases the chance that these goals and impacts will be emphasized and focused on by the project. That chance is further increased by the need to complete SDG goal verification process during a project's registration process. | | | | | | | |
|--------------------|---|--|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | | | | | | | | |
| Scoring Definition | Each project is sustainable dev the most releva | Each project is scored on a scale of 1 to 5, where 1 indicates that no relevant sustainable development goals appear to have been targeted and 5 indicates that both the most relevant sustainable development goals have been targeted. | | | | | | |
| Scoring Approach | MSCI ESG Research conducts a review of project documentation to identify whether the project has targeted either sustainable development goal 5 (Gender Equality) or 10 (Reduced Inequalities). | | | | | | | |
| | Each project is then scored on a 3-point scale from 1 to 5 based on the number of relevant targeted SDGs. | | | | | | | |

4.1.3.2.2 Zero Employment Discrimination

Zero Employment Discrimination relates to whether the project actively and explicitly practices zero employment discrimination as part of its project activities.

| Rationale | Projects that more actively and openly embrace zero employment discrimination initiatives will increase the likelihood of hiring a diverse workforce that does not exclude marginalized or disadvantaged groups. | | | | | | |
|-------------|--|------------|---|------------------------|---------------------|------------------------|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | | | |



| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that activities do not appear to do anything proactive to ensure zero discrimination and 5 indicates that projects explicitly support zero employment discrimination practices. | | | | | |
|--------------------|---|--|--|--|--|--|
| | MSCI ESG Research reviews both registry safeguard policies and project documentation to assess the extent to which projects have complied with zero employment discrimination practices. | | | | | |
| Scoring Approach | Projects that explicitly practice zero employment discrimination achieve a score of 5. Projects that do not explicitly reference their practice of zero employment discrimination, but this is required through the associated registry standards receive a 3. If a project makes no explicit reference to it, and its registry does not require it, then the project receives a 1. | | | | | |

4.1.3.2.3 Female Empowerment

Female Empowerment relates to whether a project supports more equal gender outcomes through active and representative inclusion of women in project activities.

| Rationale | Projects can su activities and de | pport more e ecisions. | qual gender outo | comes by invo | lving women in | i key project | | |
|--------------------|--|--|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is appear to suppo seem to signific | Each project is scored on a scale of 1 to 5, where 1 indicates that activities do not appear to support more equal gender outcomes and 5 indicates that project activities seem to significantly involve the participation of women. | | | | | | |
| Scoring Approach | MSCI ESG Research conducts a review of key project documents to assess the participation of women in project activities. In particular, the proportion of people with employment, improved health and/or training that are women is assessed through an analysis of project monitoring and verification reports. | | | | | | | |
| | Projects are then scored based on both whether the project's activities explicitly target improved gender outcomes and the proportion of the project's beneficiaries that are women. | | | | | | | |

4.1.3.3 Education and Infrastructure

As well as supporting direct, near-term social impacts, ARR projects can lay the foundations for future development by investing in local education, health and infrastructure.

To assess a project's impact on education and infrastructure, three sub-criteria are considered:

- **4.1.3.3.1 Target SDGs:** Whether a project targets specific sustainable development goals related to education and infrastructure.

- **4.1.3.3.2 External Project Funding:** Whether a project funds any education, healthcare, or infrastructure projects through its activities.
- **4.1.3.3.3 Education and Training Outcomes:** Whether a project explicitly supports and monitors improved education and training through its activities.

Each of these sub-criteria is assessed on a scale of 1 to 5, with the overall score based on a weighting of each. 4.1.3.3.2 External Project Funding and 4.1.3.3.3 Education and Training Outcomes are weighted 50% and 45% respectively, while 4.1.3.3.1 Target SDGs is just 5%.

4.1.3.3.1 Target SDGs

MSCI

Target SDGs refers to whether the project explicitly targets sustainable development goals (SDGs) related to education and infrastructure.

| Rationale | Explicitly targeting certain development goals increases the chance that these goals and impacts will be emphasized and focused on by the project. That chance is further increased by the need to complete SDG goal verification process during a project's registration process. | | | | | | | |
|--------------------|--|------------|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that no relevant sustainable development goals have been targeted and 5 indicates that five or more sustainable development goals relevant to education and infrastructure have been targeted. | | | | | | | |
| Scoring Approach | MSCI ESG Research conducts a review of key project documents to identify whether a project has targeted either SDG 3 (Good Health & Wellbeing), 4 (Quality Education), 6 (Clean Water & Sanitation), 7 (Affordable & Clean Energy), 9 (Industry, Innovation & Infrastructure), 11 (Sustainable Cities & Communities), 12 (Responsible Consumption And Production), 16 (Peace, Justice & Strong Institutions) or 17 (SDG Partnerships). | | | | | | | |
| | Projects are then scored based on the number of relevant targeted SDGs. | | | | | | | |

4.1.3.3.2 External Project Funding

External Project Funding related to whether a project funds any education, healthcare, or infrastructure projects through its activities.

| Rationale | Projects can directly invest in and support local education, healthcare, or infrastructure projects to improve social outcomes in the local community. | | | | | |
|-------------|--|------------|---|------------------------|---------------------|------------------------|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets |
| | | | | | | |



| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that the project does not appear to fund auxiliary projects and 5 indicates that projects' activities seem to fund multiple auxiliary projects across education, health and infrastructure. |
|--------------------|---|
| Scoring Approach | MSCI ESG Research reviews key project documents to create a list of auxiliary projects for which the project supports funding. Both the number and types of auxiliary projects are considered. For projects that fund multiple hospitals or schools, these are treated individually in our calculation of the total number of auxiliary projects funded. |
| | Projects are then scored on a 1 to 5 scale based on a combination of the types of auxiliary projects funded and the number of total auxiliary projects funded. |

4.1.3.3.3 Education and Training Outcomes

Education and Training Outcomes related to whether a project explicitly supports and monitors improved education and training through its activities.

| Rationale | Projects can directly contribute to, quantify, and monitor improved education and training outcomes in their local community. | | | | | | | |
|--------------------|--|------------|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that a project does not appear to positively impact local health, and 5 indicates that a projects' activities seem to positively impact the health of a significant proportion of local households. | | | | | | | |
| Scoring Approach | MSCI ESG Research reviews key project documents to assess both the relevance of activities to education and training, and the quantified number of people that benefit from these activities. Projects with activities that are highly relevant to improving health outcomes and can demonstrate that they impact at least 5% of the local population achieve a score of 5. Remaining projects are scored 1-5 based on the type of initiatives implemented and the estimated number of people that benefit from these initiatives. | | | | | | | |

4.1.3.4 Biodiversity

By planting forested areas, ARR projects not only capture carbon within the forests but also can enrich and support diverse habitats and ecosystems within them. In this way, ARR projects have environmental benefits beyond their emissions impact.

The significance of this impact depends on the tree planting strategy (in particular, type and range of trees planted), the biodiversity context (i.e., richness) of the specific project area and the activities undertaken by the project to protect, enhance and monitor that biodiversity.

To assess a project's impact on biodiversity, five sub-criteria are considered:

 4.1.3.4.1 Target SDGs: Whether a project targets specific sustainable development goals related to biodiversity.



- **4.1.3.4.2 Planting Biodiversity:** Whether a project plants a suitable and diverse mix of tree species for the area that maximizes its biodiversity potential.
- **4.1.3.4.3 Resource Health:** The extent to which the project improves and monitors the soil health and water quality within its area.
- **4.1.3.4.4 Monitoring:** Whether a project monitors biodiversity within its project area and actively engages in activities to support and protect biodiversity.
- **4.1.3.4.5 Geospatial Biodiversity Value:** Whether a project is located within an area of high biodiversity value.

Each of these sub-criteria is scored on a 1 to 5 scale, and weighted to reach an overall score for 4.1.3.4 Biodiversity. 4.1.3.4.2 Planting Diversity is weighted 35%, 4.1.3.4.5 Monitoring and 4.1.3.4.5 Ecosystem Richness are weighted 25% each, 4.1.3.4.3 Resource Health is weighted 10% and 4.1.3.4.1 Target SDGs is weighted 5%.

4.1.3.4.1 Target SDGs

Target SDGs refers to whether the project explicitly targets sustainable development goals (SDGs) related to biodiversity.

| Rationale | Explicitly targeting certain development goals increases the chance that these goals and impacts will be emphasized and focused on by the project. That chance is further increased by the need to complete SDG goal verification process during a project's registration process. | | | | | | | |
|--------------------|---|--|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is sustainable dev land and water | Each project is scored on a scale of 1 to 5, where 1 indicates that no relevant sustainable development goals appear to have been targeted and 5 indicates that both land and water biodiversity sustainable development goals have been targeted. | | | | | | |
| Scoring Approach | MSCI ESG Research conducts a detailed review of key project documents to identify whether the project has targeted either sustainable development goal 14 (Life under Water) and 15 (Life on Land). | | | | | | | |
| | Projects are then scored based on the number of relevant targeted SDGs. | | | | | | | |

4.1.3.4.2 Planting Biodiversity

Planting Biodiversity refers to whether a project plants a suitable and diverse mix of tree species for the project area that maximize the biodiversity potential of the area.

| Rationale | The biodiversity impact of an ARR project is likely to be higher if the project has planted a diverse mix of trees that are native and/or highly suitable to the project area. | | | | | | |
|-------------|--|------------|---|------------------------|---------------------|------------------------|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | \checkmark | | |



| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that the project has planted a monoculture of non-native tree species, and 5 indicates that the project has planted a diverse mix of native tree species are designed to support a wide range of threatened species. |
|--------------------|--|
| Scoring Approach | MSCI ESG Research conducts a detailed review of key project documents to identify the number and types of tree species planted as part of the project's activities. It is then assessed whether these tree species are native to the project area using a combination of project documentation and third-party data. |
| | Projects are then scored based on both the types and range of tree species planted. |

4.1.3.4.3 Resource Health

Resource Health refers to the extent to which the project improves and monitors the soil health and water quality within its area.

| Rationale | Projects can support soil and water health through their planting biodiversity (as measured in 4.1.3.3.2) but can also implement specific activities and monitoring techniques to ensure these benefits are maximized and accurately measured. | | | | | | | |
|--------------------|--|---|--|---|--|------------------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates that the project does not have specific activities or monitoring techniques targeted at water or soil health and 5 indicates that the project has specific activities in place to improve water or soil health and clear monitoring of these results. | | | | | | | |
| | MSCI ESG Research reviews a project's key documents to understand whether it has specific activities in place to improve water or soil health and whether it monitors and tracks this over time. | | | | | | | |
| Scoring Approach | Projects that de Projects that cl monitoring plar both improved | o not target, r early target i ns in place re water and so | nonitor, or track w mproved water of ceive a score of 3 il health receive a | water or soil h r soil health bu 3. Projects tha a score of 5. | ealth receive a ut do not have o it both target ai | score of 1. clear nd monitor | | |

4.1.3.4.4 Biodiversity Monitoring

Biodiversity Monitoring refers to the extent to which the project engages in ongoing monitoring of the biodiversity within its area.

| | Monitoring and training initiatives can help to not only track the biodiversity within a |
|-----------|--|
| Rationale | project area but also identify biodiversity opportunities and risks that a project can |
| | focus on. |



| Kev Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|
| | | | | | | | | |
| Scoring Definition | Each project is monitoring or to and tracks biod | Each project is scored on a scale of 1 to 5, where 1 indicates that no biodiversity monitoring or training activities are present and 5 indicates that the project monitors and tracks biodiversity outcomes in an effective way with regular monitoring periods. | | | | | | |
| Scoring Approach | MSCI ESG Research assesses the project's approach to monitoring biodiversity outcomes both prior to its start (to establish a baseline) and through its lifetime. Three separate components of biodiversity monitoring are considered: Frequency of Monitoring: How frequently biodiversity outcomes are monitored. Projects that do not monitor biodiversity receive a score of 1. Projects that frequently monitor biodiversity outcomes receive a score of 3. Techniques: Whether the project implements best-practice techniques such as using geospatial analysis or buffer zones to monitor biodiversity. Projects that use either of these techniques receive a score of 1. Type of Impact Assessment: The type of monitoring survey conducted by the project. Projects that conduct a biodiversity survey receive a score of 1. Projects that conduct a more detailed SBIA or BIA (Social and Biodiversity Impact Assessment) get 2 points. | | | | | | | |

4.1.3.4.5 Geospatial Biodiversity Value

This criterion refers to whether the project conserves an area of high biodiversity value.

| Rationale | The biodiversity impact and conservation value of a nature-based project is likely to be higher if it is located in an area of high biodiversity and species richness. | | | | | | | |
|--------------------|--|--------------|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | | \checkmark | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates the project has very limited biodiversity value, and 5 indicates the project supports and conserves an area of very high biodiversity value. | | | | | | | |
| Scoring Approach | MSCI ESG Research conducts detailed geospatial analysis on the project area assess four components: (i) ecosystem scarcity; (ii) biodiversity intactness; (i biodiversity threat; (iv) biodiversity support. | | | | | | | |
| 2.11 | More detail on the approach is found in the MSCI Carbon Project Ratings Overall Methodology Note. | | | | | | | |



4.2.2 Quantification of Outcomes

Quantification of outcomes relates to whether the project monitors and/or quantifies the impact of the project on targeted sustainable development goals.

| Rationale | Assessing the which co-benet measure, quan support of the | Assessing the evidence of co-benefit impacts is crucial to evaluating the degree to which co-benefits are achieved and can be attributed to a project. Projects that measure, quantify, and monitor their co-benefit impacts provide greater evidence in support of the targeted social and environmental benefits being achieved. | | | | | | |
|--------------------|---|---|---|------------------------|---------------------|------------------------|--|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | | |
| | \checkmark | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 1 indicates there is no quantification or monitoring of SDGs and 5 indicates that benefits are quantified and monitored. | | | | | | | |
| Scoring Approach | MSCI ESG Reso and/or monitor | MSCI ESG Research assesses the level to which co-benefits have been quantified and/or monitored. | | | | | | |

4.3.2 Local Stakeholder Engagement

It is clear from literature that the quality of engagement by ARR projects with local stakeholders plays a key role in ensuring communities benefit from their activities, as well as also helping to mitigate human-based permanence risk. Projects that put additional resources and time into consulting with their local communities, and modifying their design/operations to suit locals are more likely to realize their social objectives.

This is evaluated through the following sub-criteria:

- **4.3.2.1 Effective Consultation:** How effective was the consultation conducted?
- **4.3.2.2 Representation and Inclusivity:** Has the project ensured proper and inclusive representation of stakeholders?
- 4.3.2.3 Access to Information: Has the project relayed relevant information to stakeholders?
- **4.3.2.4 Feedback and Grievances:** Does the project display effective feedback and grievance redressal mechanisms?

Each project is scored on a 1 to 5 scale for each of these sub-criteria. An overall score for criterion 4.3.2 is then reached by weighting effective consultation and representation and inclusivity by 35% each and access to information and feedback and grievance 15% each. Projects scoring a 5 will represent projects that undertake detailed stakeholder consultations that are representative of the target users.

4.3.2.1 Effective Consultation

Effective consultation relates to whether the project uses best-practice techniques to engage and consult with stakeholders.



| Rationale | Projects that engage with stakeholders towards the start of a project's conception and use multiple methods of in-person consultation provide more open and effective channels to engage with stakeholders and receive any feedback. | | | | | | |
|--------------------|---|------------|---|------------------------|---------------------|------------------------|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | \checkmark | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5 scale, where 5 indicates that the project appeared to conduct effective in-person engagements prior to its start, and 1 indicates that very limited in-person stakeholder consultation seemed to have been performed prior to the start of the project or thereafter. | | | | | | |
| | Through a review of project documents, three main components of stakeholder consultation effectiveness are assessed. | | | | | | |
| Scoring Approach | First, the first date of stakeholder consultation is compared to the project start date. Projects that conducted their initial consultation prior to their start date receive a score of 2. Second, the types and range of consultation conducted are considered. Projects that conducted multiple forms of engagement including an in-person consultation receive 2 points. Third, the frequency that ongoing consultation is conducted is assessed. Projects that perform ongoing consultation receive 2 points. | | | | | | |
| | These three component parts are then summed up, with a maximum score of 5 possible points. | | | | | | |

4.3.2.2 Representation and Inclusivity

Representation and Inclusivity relates to whether the project has ensured that it consults with a representative and inclusive range of stakeholders.

| Rationale | Projects which consult a greater number of stakeholders tend to incorporate more representative feedback and ensure that they are designed with a representative set of stakeholder interests in mind. | | | | | |
|--------------------|--|------------|---|------------------------|---------------------|------------------------|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets |
| | \checkmark | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5, where 5 indicates that a project transparently consults with a representative group of stakeholders, including women, while 1 indicates that no information is provided on the which stakeholders were consulted. | | | | | |
| Scoring Approach | MSCI ESG Research assesses if the number of stakeholders in attendance has been provided. In particular, if the total number of stakeholders and the number of female attendees is disclosed. | | | | | |



4.3.2.3 Access to Information

Access to Information refers to whether the project provides transparent and detailed information to (local) stakeholders regarding its activities.

| Rationale | By providing greater access to information, stakeholders will be better informed on a project's activities and more able to provide feedback to the project. | | | | | | |
|--------------------|--|------------|---|------------------------|---------------------|------------------------|--|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets | |
| | | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5 scale, where 5 indicates that a project provides very transparent access to information through both documentation and inperson meetings, and 1 indicates that limited access to information is provided to stakeholders. | | | | | | |
| | MSCI ESG Research conducts a detailed review of relevant project documentation to understand whether in-person meetings were conducted to present project information or whether clear documentation was/is provided. | | | | | | |
| Scoring Approach | For in-person meetings, projects receive a score of 2 if they have conducted meetings to present information on the projects, and 0 otherwise. For documentation, if any documentation has been provided to local communities, projects receive a score of 3 if PDDs and/or pamphlets are provided, and 1 otherwise. | | | | | | |
| | The overall scores are based on adding each of these to reach a score from 1 to 5. | | | | | | |

4.3.2.4 Feedback and Grievance

Feedback and Grievance refers to whether the project has procedures in place to receive and act on feedback received from stakeholders.

| Rationale | By providing (local) stakeholders with a clear feedback mechanism and committing to disclose and act on this feedback, then projects are more likely to satisfy the needs of stakeholders by both listening and responding to their feedback. | | | | | |
|--------------------|--|------------|---|------------------------|---------------------|------------------------|
| Key Sources | Project Documentation | Geospatial | Project Methodology Documentation | Academic Literature | Third-party Data | MSCI Carbon Markets |
| | | | | | | |
| Scoring Definition | Each project is scored on a scale of 1 to 5 scale, where 5 indicates that a project provides very transparent access to information through both its documentation and the holding of in-person meetings, and 1 indicates that stakeholders appear to have only limited access to information. | | | | | |
| Scoring Approach | Three aspects of a project's feedback procedure are assessed: Feedback Mechanism: Whether a project has a feedback and grievance procedure in place. | | | ce procedure | | |



- **Feedback Disclosure:** Whether a project transparently discloses any feedback received.
- Feedback Response: Whether a project has clearly acted on any feedback received.

Projects receive a score of 3 if they have a feedback mechanism in place, and 1 otherwise. For the other 2 factors, projects receive a score of 1 if they satisfy this factor. The overall scores are then based on adding each of these components to reach a score from 1 to 5.



9. Appendix – Key References

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10. Change log

| Date | Key Changes | |
|-------------|-------------|---------------------|
| 01-Nov-2024 | | Initial publication |
| | | - |
| | | |



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