Carbon Project Ratings – Safe Water Methodology

MSCI ESG Research

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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 safe water 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 safe water projects unless explicitly excluded in this document.

This methodology is subject to MSCI ESG Research's methodology governance and update process, as outlined in the overall methodology note. This ensures that updates and refinements to the methodology align with evolving best practices, stakeholder input, and the latest data insights. For details on the governance process, methodology updates, and review timelines, please refer to Section 12 of the MSCI Carbon Project Ratings and Assessments Methodology 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 safe water 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 safe water projects.

Introduction to carbon project integrity

What is carbon credit integrity?

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 (CO_2e) 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 (CCQI). The IC-VCM aims to create minimum standards of integrity with a set of Core Carbon

[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.

Principles (CCPs), and the CCQI has developed a detailed 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 CO_2e has been reduced/removed?

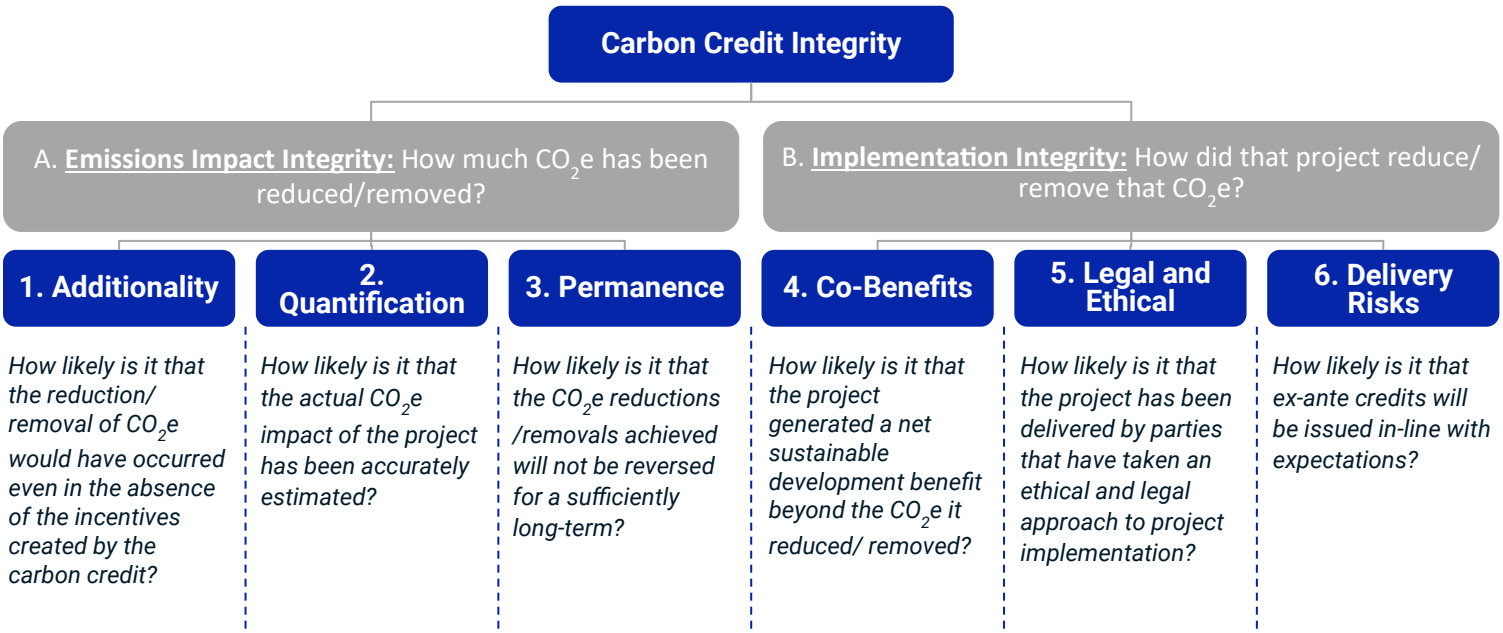
B. **Implementation integrity:** How did that project reduce/remove that CO_2e?

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



Introduction to safe water projects

What are safe water projects?

Approximately one in three people worldwide do not have access to safe water, according to the World Health Organization (WHO).[3] As a result, many of these people make their local water supply safe to drink by boiling it on open fire systems using solid fuels (such as wood or charcoal). These fires produce emissions that can be avoided by providing households with alternative safe water sources, such as boreholes, filtration technologies or purification devices.

By supplying technologies that purify or filter water, safe water projects can improve access to safe water without boiling, meaning that less fuel and firewood are required to meet a household's needs, reducing emissions from both greenhouse gases and other pollutants.

The benefits can be large and far-reaching. Aside from the reduced emissions from lower fuel consumption, projects can support significant positive health outcomes (each year, nearly one million people die from illnesses related to the lack of safe water access)[4] and gender empowerment in communities through reducing the time that women spend collecting fuelwood. They can also reduce local deforestation and degradation, and support job creation.

The definition of safe water for the purposes of MSCI Carbon Project Ratings includes all technologies and practices that improve access to safe water. This includes water filtration technologies, purification devices or boreholes.

Market overview

Safe water represents an important project type within the voluntary carbon market. As of December 2023, there were over 250 registered safe water projects, with a further 200+ awaiting registration.

Safe water projects are overwhelmingly located in developing countries. Over 90% are located in sub-Saharan Africa, with the five biggest countries in terms of number of projects being: (1) Uganda (74 projects); (2) Rwanda (41 projects); (3) Eritrea (38 projects); (4) Malawi (38 projects) and (5) Kenya (37 projects).

Two other key common characteristics of safe water projects are their size and grouped nature. Over 65% of projects are microscale (in which they reduce less than 10,000 t CO_2e per year). They are also overwhelmingly conducted as grouped projects, in which individual project instances are grouped as part of the registration process given their similar characteristics — 95% of safe water projects are grouped.

Key integrity considerations

While the idea behind safe water projects is a simple one, their successful execution involves a complex multi-step process. This complexity can introduce integrity risks that credit buyers should assess and ensure are mitigated. To ensure a project is of high integrity, three key areas of the project activity chain are focused on:

- **Target Population Characteristics:** Central to the question of additionality is whether the project targets a population that would otherwise have faced significant barriers to accessing safe water.

[3] https://www.who.int/news/item/18-06-2019-1-in-3-people-globally-do-not-have-access-to-safe-drinking-water-unicef-who

[4] https://www.unicef.org/media/137206/file/triple-threat-wash-EN.pdf

- **Usage:** Safe water technologies must be designed to meet local habits and supported by user training to ensure that technologies are used as intended on an ongoing basis for long after they are handed out.
- **Monitoring and Quantification:** Quantification of a project's emission reductions involves a number of hard-to-measure assumptions, and this introduces uncertainty and risk. Effective monitoring is also crucial to ensure that these assumptions are updated regularly throughout the project's lifetime.

Approach to assessing the integrity of safe water projects

MSCI ESG Research's assessment of safe water projects builds on the overall MSCI Carbon Project Ratings methodology to provide more in-depth analysis of safe water 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 sub-criteria evaluate a deeper set of questions, which are focused on the most important, specific drivers of integrity for safe water 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 safe water projects than what would be possible using the overall MSCI Carbon Project Ratings methodology alone.

In total, MSCI ESG Research assesses 17 sub-criteria and 31 metrics (see Figure 2) 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 safe water projects. Each of these sub-criteria align with and replace corresponding sub-criteria scores in the overall MSCI Carbon Project Ratings methodology.

Figure 2: MSCI ESG Research Overall Carbon Project integrity assessment

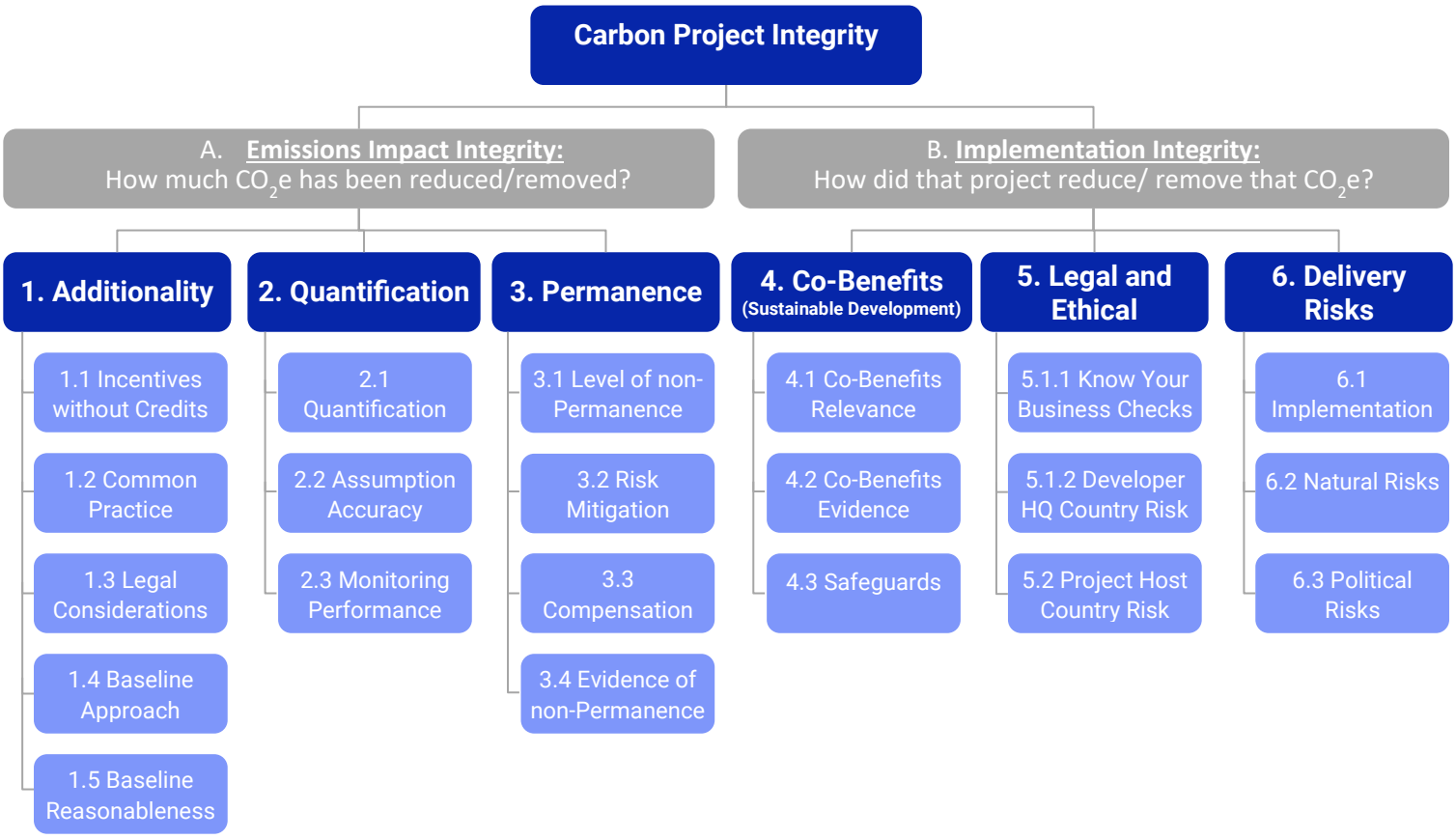
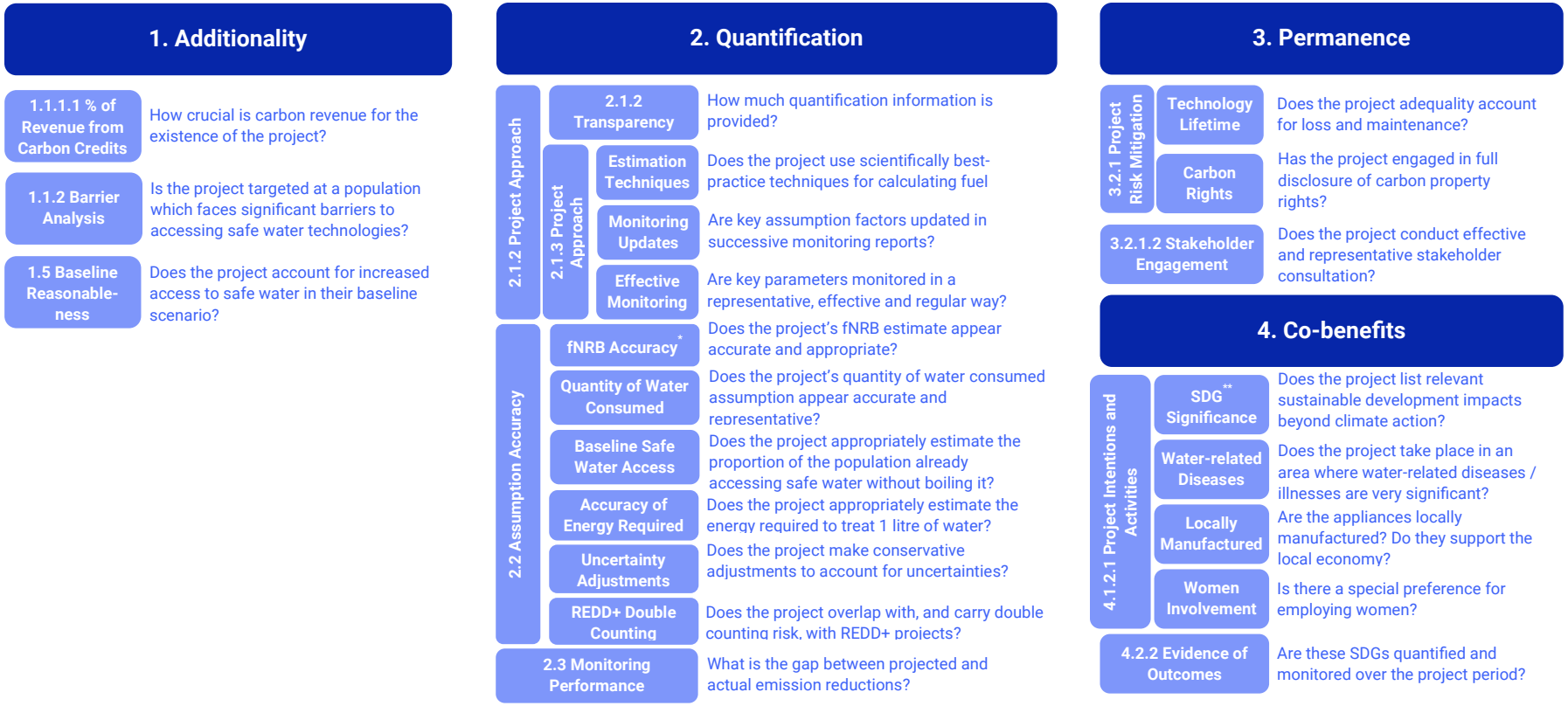


Figure 3: Sub-criteria and metrics that differ in the safe water assessment approach



*Notes: * Fraction of nonrenewable biomass (fNRB) is the proportion of biomass saved that is nonrenewable (that is, the proportion of woody biomass that did not come from sustainable sources). ** Sustainable Development Goals (SDGs) are a collection of environmental, social and economic objectives created by the United Nations.*

Assessment of all other criteria and sub-criteria, for example, Criterion 5, Legal and Ethical Risks, and Sub-criterion 1.2, Common Practice, within the safe water 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 safe water-specific characteristics), means that no further enhancement is required.

For a detailed explanation of MSCI ESG Research's approach to data quality and update processes — including measures to ensure data accuracy, handle missing data, and update data in a frequent and recurring manner — please refer to our overall methodology note. This document outlines the steps MSCI ESG Research takes to verify data reliability and address any data gaps, ensuring consistency and accuracy across all project types.

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.

For safe water projects, the key consideration for additionality is whether the target household would have gained access to safe water even without carbon credits. On the supply side, for example, the project developer may have distributed water filtration technologies in a similar manner even without carbon credits. On the demand side, households may have chosen to invest in improved safe water technologies, given their benefits, even if the technologies were not provided at subsidized prices.

Figure 4 illustrates the sub-criteria and metrics through which the additionality of safe water projects is assessed, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. MSCI ESG Research's project type-specific approach to assessment of the additionality of safe water projects focuses on evaluating three key topics with five main metrics. The detailed sub-criteria are described in Figure 5.

Figure 4: Safe water additionality assessment approach

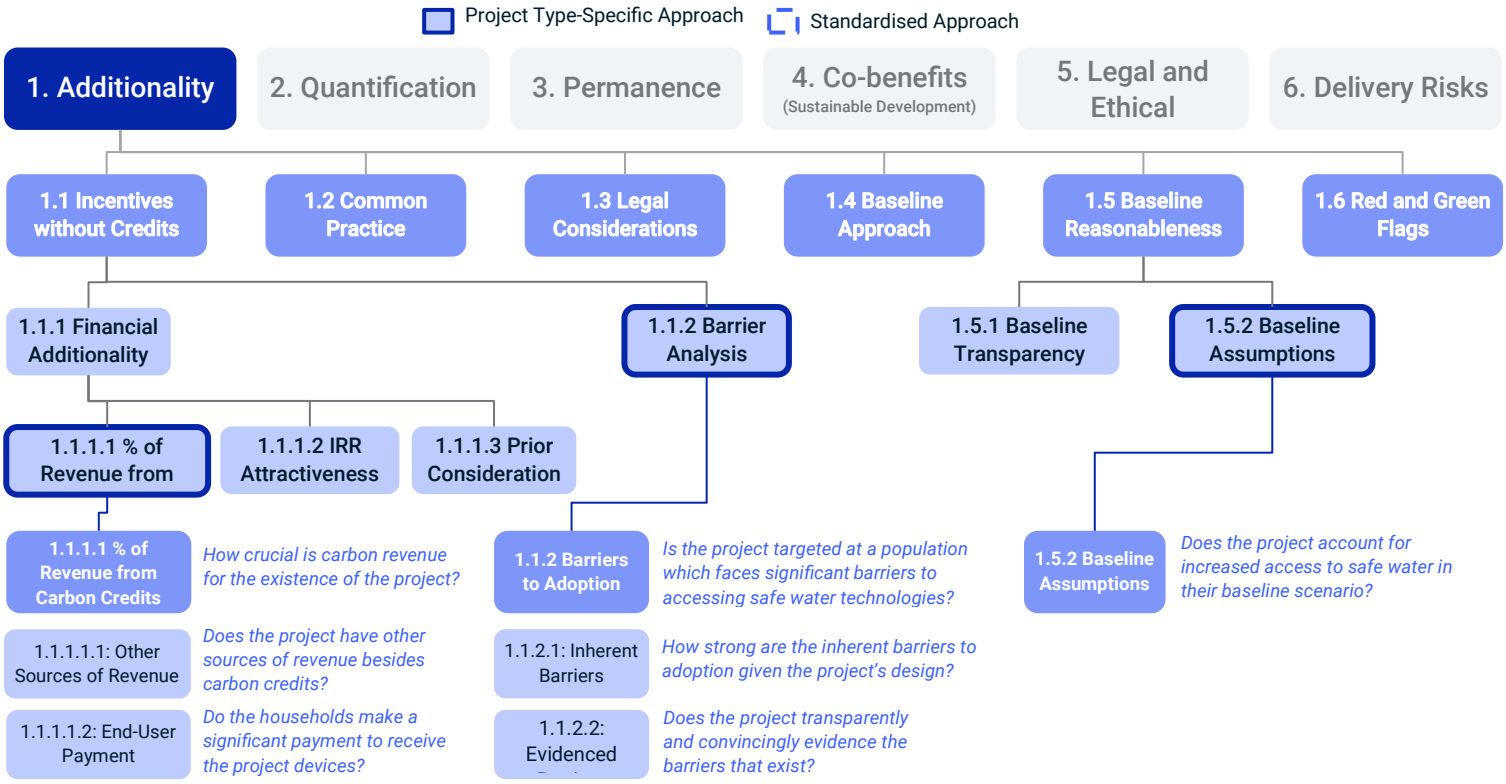


Figure 5: MSCI ESG Research Additionality integrity assessment framework

Sub-criteria		Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
1.1 Incentives without Carbon Credits	1.1.1 Financial Attractiveness	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		1.1.1.2 IRR Analysis	Credits should play a decisive role in making a project financially attractive that would otherwise have not been.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		1.1.1.3 Prior Consideration	Carbon credits should have been clearly considered at the time the decision to go ahead with a project was taken.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	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.	✗	✓	✗	✓	✓	✗	✓	✗	✓	✓
1.2 Common Practice		Market Penetration	If a practice is already common within a market, it indicates that these types of projects will go ahead without the introduction of carbon credits.	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.3 Legal Considerations		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 Baseline Approach		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		Baseline Transparency	Transparent detail on a project's assumptions is required to make an objective assessment of a project's performance and additionality.	✓	✗	✓	✗	✗	✗	✗	✓	✗	✓
		Baseline Assumptions	MSCI ESG Research assesses the key baseline scenario assumptions for each project type.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
1.6 Red and Green Flags		News scanning	Review of academic papers, industry sources and the news for Red or Green Flags to project's additionality.	✓ *Standardized approach*									

✓ *Assessed* ✗ *Not Assessed*

1.1.1.1 % of Revenue from Carbon Credits

Financial attractiveness plays a key role in determining whether carbon credits are crucial to the implementation of the project.

Safe water technologies can be sold without the use of carbon credits by both private enterprises and NGOs. For example, organizations could receive external funding, or sell safe water technologies to end-users at a high enough price to support their operations without the need for carbon credits. Understanding a project's revenue and funding sources therefore helps to assess whether carbon credits played an important role in incentivizing the distribution of safe water access to communities that would otherwise not have access or enough funding for them. When safe water projects receive all (or the vast majority) of their revenue from carbon credits, it indicates that credits were more decisive in the project going ahead.

The score for this criterion is based on both the level of end-user payment for that technology and whether any other sources of revenue exist for the project. This is summarised in the following sub-criterion:

- **1.1.1.1.1 User Payments and Other Revenue Sources:** Whether carbon credits play a decisive role in increasing the affordability of the clean water technology.

1.1.1.1.1 User Payments and Other Revenue Sources

User Payments and Other Revenue Sources relates to whether carbon credits play a decisive role in increasing the affordability of the clean water technology.

Rationale	For a project to be additional, it is important that carbon credits both played an important financial role in incentivizing the project to go ahead and ensuring the technology could be accessed. On the project side, a project receiving revenue from sources other than carbon credits may be less financially additional as it could be implemented without the need for credits. Projects without additional revenue are financially dependent on the carbon credits for the project to occur and are therefore very likely to be financially additional. On the user side, the greater the subsidy for the safe water device, the more likely it is to be financially additional. If projects are only partially funded, there is less financial dependence on carbon credits to implement it. Projects providing clean water devices to users free of charge or at a very high level of subsidy have a greater financial additionality. MSCI ESG Research also takes into account that some projects charge a small fee to the end user to encourage use of the clean water devices, and this prevents the risk of reversal.
Key Sources	Project Documentation: ☑ | Geospatial:	Project Methodology Documentation:	Academic Literature:	Third-party Data: ☑	MSCI Carbon Markets:
Scoring Definition	Each project is scored on a 2-5 scale, where 2 indicates that projects do not provide any subsidies and revenue outside of carbon credits and product sales and 5 indicates projects have no other source of revenue and provide the technology at free or highly discounted price. If this information is not provided, a project scores 2.5.
Scoring Approach	MSCI ESG Research assess whether there are any other sources of revenue disclosed and at what price clean water devices are provided to end-users compared to its non-subsidized cost.

In particular, whether there is any outside government financing or if the clean water devices are provided to users free of charge or sold at a reduced price are considered.

The level of alternative funding source and end-user payment is then combined with a view on the type of technology provided by the project. More advanced technologies that create higher user benefit compared to the baseline technology therefore receive a multiplier, given that the same subsidy will have a greater impact on the financial incentives for these projects.

Firstly, the extent of the end-user payment and other revenue sources is considered.

This is then combined with a view on the type of technology provided by the project. More advanced technologies that create higher user benefit compared to the baseline technology therefore receive a multiplier, given that the same subsidy will have a greater impact on the financial incentives for these projects. For example, to be financially additional, it is less important for a project that provides solar-powered safe water technologies in its activities to provide these for free given the amount of end-user value being provided here.

1.1.2 Barrier Analysis

The strength of the barrier plays a key role in determining the additionality of a project and the extent to which it requires carbon credits for implementation. For safe water projects, the lack of income of end-users represents a key financial barrier to adoption of more efficient safe water technologies as households lack the wealth to make up-front payments for them. The extent of this financial barrier depends on the socioeconomic condition of the target population: rural, Least Developed Countries- (LDCs-) focused target populations tend to experience higher financial barriers. In this way, the size of barriers is related to the inherent characteristics of the project's target population.

Project developers can also seek to evidence and justify the presence of barriers as part of their additionality tests. They can, for instance, cite investment barriers or a common practice analysis. A strong barrier analysis considers various barriers and provides several sources of evidence to prove the need for carbon investment.

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

- **1.1.2.1 Inherent Barriers:** If the project is located in an urban or rural region, whether it is implemented in an LDC and if this is on a small or large scale.
- **1.1.2.2 Evidenced Barriers:** The number of tests used to justify the additionality of the project and the strength of barriers evidencing this.

Each project is scored on a 1 to 5 scale based on these two metrics. The highest score of the inherent barriers (1.1.2.1) and evidenced barriers (1.1.2.2) is taken as the overall score for Strength of Barriers. This is to account for many of the projects being of small or micro scale and in LDCs, and therefore deemed automatically additional by the crediting program methodologies. They would not be required to perform additionality tests such as the barrier analysis, and therefore would not receive a score for 1.1.2.2 Evidenced Barriers.

1.1.2.1 Inherent Barriers

Inherent barriers relate to the extent to which the project's target population faces barriers to adopting efficient safe water technologies due to the project's inherent characteristics, such as the specific location and target population's level of income.

Rationale	Populations that have lower income or less access to more efficient safe water technologies face more inherent barriers. Projects that are targeted at populations with these characteristics are therefore more likely to require carbon credits to overcome these barriers.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑			☑		☑

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates developed, urban regions with large-scale projects that are less likely to be additional. Projects scoring 5 are likely to be smaller scale in rural LDCs and therefore more likely to be additional.
Scoring Approach	MSCI ESG Research identifies the presence and severity of barriers for projects based on their project's size, location and target population. For example, whether a project is located in an LDC, whether it targets a rural or urban population and whether it is small, large or microscale. Data on project's size, location and target population are based on a combination of information from the MSCI Carbon Markets Platform and a detailed review of project documentation. Each project is then scored based on the project scale, location type and country type.

1.1.2.2 Evidenced Barriers

This refers to whether the project owner convincingly and accurately justifies its case that significant barriers to implementation exist that carbon credits helped to overcome.

Rationale	Projects that offer more evidence that carbon credits played a decisive role in them going ahead inspire greater confidence in their additionality. MSCI ESG Research evaluates whether projects justify the existence of barriers with high-quality evidence. Projects that use various, high-quality sources to support the justification of barriers that exist, are more likely to be additional. High-quality sources may come through academic references or detailed surveys of the local population.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑				☑	☑

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that the project does not provide any evidence for the existence of barriers and 5 indicates that the project provides a range of well-regarded primary and secondary evidence.
Scoring Approach	MSCI ESG Research reviews a project's barrier analysis using its project documentation. The strength of the barrier analysis is then evaluated based on its range and quality of evidence. For range, MSCI ESG Research assesses how many barriers were identified (such as investment, social awareness, technological). For quality of evidence, MSCI

ESG Research identifies the key sources used by the project to justify the existence of these barriers, such as primary research, expert input or third-party data.

The number of barriers and the sources used are then combined to create a strength-of-barrier score.

1.5 Baseline Reasonableness

Baseline reasonableness relates to whether the project assumes an increasing penetration of access to safe water in its baseline scenario over time.

Rationale	For safe water projects, the baseline scenario is generally the continued usage of the boiling practice used prior to the project, such as an open fire. Given the limited baseline scenarios that exist, the risk of inaccurate baseline selection is reasonably low for safe water projects. Note, with some populations, one would expect that even without the project's activity, there would be a gradual increase in access to safe water. Projects that do consider the possible increased adoption of safe water technologies by their local population therefore incorporate more conservativeness in their approach.

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 no consideration of increasing safe water access in the baseline scenario despite the likelihood of high growth in safe water access, and 5 indicates that the uptake in safe water access in the baseline is appropriate given the likely growth in penetration.
Scoring Approach	MSCI ESG Research conducts a detailed review of key project documents to identify whether a project has assumed that there would be an increase in access to safe water in its baseline scenario. None of the 300 safe water projects assessed to date account for any increased safe water access in their baseline. A higher score will be assigned to any project identified in the future that does incorporate a rising level of access in its baseline. Data from the United Nations Children's Fund (UNICEF)[5] and WHO on access to safe drinking water within each country and region type (for example, rural or urban)[6] is then collated to assess both the level and growth in safe water access in that region since the project start date. A project's score is based on the level and growth in penetration.

[5] https://data.unicef.org/topic/water-and-sanitation/drinking-water/

[6] https://www.who.int/data/gho/data/indicators/indicator-details/GHO/population-using-at-least-basic-drinking-water-services-(-)

Criterion 2 – Quantification

Quantification refers to the likelihood that the emission reduction or removals claimed by the 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 CO_2e actually reduced/removed. In theory, all carbon credits are worth the equivalent of one tonne of CO_2e 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 one tonne. In this case, buyers should be cautious in using one credit to offset one tonne of their own CO_2e emissions, as they are unlikely to be equivalent.

Quantifying a safe water project's emissions reduction involves a complex calculation that requires a project to make a number of hard-to-measure assumptions, such as on the proportion of the population already with access to safe water, the fraction of nonrenewable biomass, the baseline water consumption and the energy required to treat one liter of water. Assessing the quantification risk of safe water projects therefore requires a detailed evaluation of a project's approaches to, and assumptions about, key inputs.

Figure 6 illustrates the sub-criteria through which MSCI ESG Research assesses the carbon quantification of safe water projects, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. The detailed sub-criteria are described in Figure 7.

Figure 6: Safe water quantification assessment approach

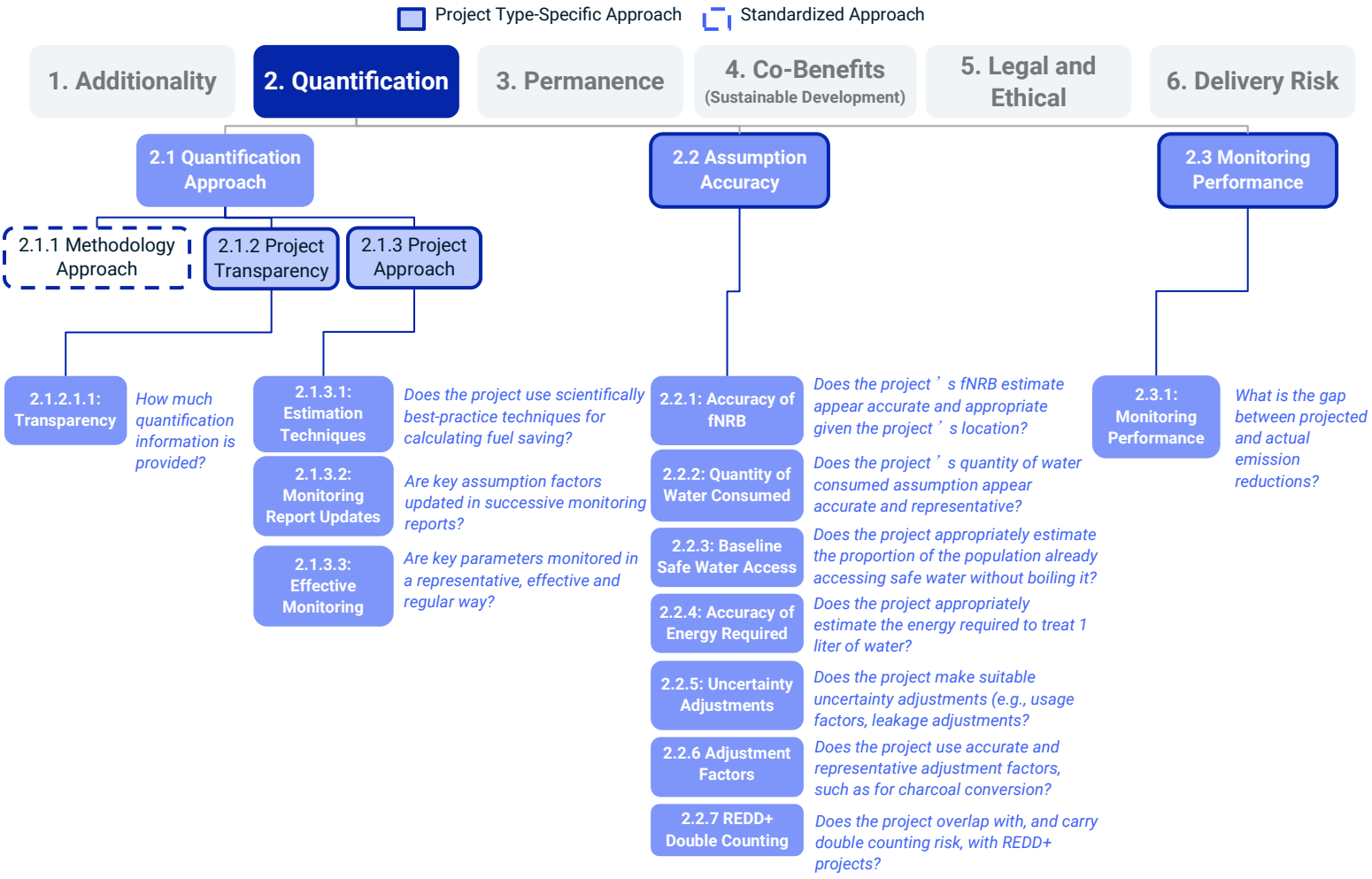


Figure 7: MSCI ESG Research Quantification integrity assessment framework

Sub-criteria	Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
2.1 Quantification Approach	2.1.1 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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2.3 Monitoring Performance	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 Transparency

Project Transparency relates to whether the project provides information on all relevant factors contributing to carbon quantification.

Rationale	A project that provides all information relevant to the measurement of carbon quantification shows more transparency. Projects which are more transparent enable MSCI ESG Research to more accurately score the project with regards to the criteria.

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 a range of critical information is missing or a complete lack of public project documentation, and 5 indicates almost all the important information has been provided via relevant documentation.
Scoring Approach	Through a detailed review of key project documentation, MSCI ESG Research collects information on a number of key parameters regarding a project's quantification approach and assumptions. Four parameters are assessed: (i) usage rates, (ii) monitoring sample sizes, (iii) fNRB values and (iv) type of water consumptions tests performed.

2.1.3 Project Approach

Projects that use more scientifically best-practice techniques increase the likelihood that key assumptions are accurately estimated.

Safe water projects need to estimate key quantification assumptions prior to the project launch and through the project's lifetime across monitoring periods. The project approach therefore needs to incorporate an assessment of both the initial estimation techniques used and the effectiveness of subsequent monitoring period updates. In total, MSCI ESG Research considers three main sub-criteria:

- **2.1.3.1 Estimation Techniques:** Whether the project uses best-practice techniques to estimate the quantity of woody biomass saved.
- **2.1.3.2 Monitoring Report Updates:** Whether the project continues to update key assumptions through its lifetime.
- **2.1.3.3 Effective Monitoring:** Whether monitoring report updates are conducted effectively, through regular monitoring of a significant sample size of the population.

Each sub-criterion is assessed independently and scored on a 1 to 5 scale. The overall score for 2.1.3 Project Approach is then calculated by giving a weighting of 40% for estimation techniques, 40% for monitoring report updates and 20% for effective monitoring.

2.1.3.1 Estimation Techniques

Whether the project uses best-practice techniques to estimate thermal efficiency and baseline quantity of biomass used.

Rationale	Academic studies have shown that in-field kitchen performance tests more accurately estimate the true thermal efficiency of an improved safe water technology than other methods, such as laboratory-based water boiling tests.[7] If more accurate kitchen performance tests were used, it would be more likely that the thermal efficiency estimate would be representative. Projects using water boiling tests or default values are at higher risk of inaccurately estimating the true thermal efficiency of a device when being used by a specific population. Similarly, the baseline quantity of woody biomass used is highly variable across projects and tends to be very specific to the population. Large-sample, in-field surveys of the amount of woody biomass used by a target population provide a more accurate estimate of this key input. A high-integrity project would implement surveys within its area prior to the distribution of improved safe water devices to determine the appropriate amount of fuel usage in the baseline scenario.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑			☑		☑

Scoring Definition	Each project is scored on a 1-5 scale, where 1 indicates that it uses a default value for both its thermal efficiency and baseline quantity of biomass estimate, and 5 indicates that best-practice kitchen performance test and in-field surveys were used.
Scoring Approach	MSCI ESG Research assesses the methods through which the project estimated three key assumptions: (i) quantity of water consumed; (ii) proportion of population that already access safe water; (iii) energy required to treat 1 liter of water. These methods are then reviewed against a range of academic literature to score approaches based on the level of scientific best-practice. The overall score is then reached by equally weighting each of these three components.

[7] Johnson, M., Edwards, R. and Masera, O. 2010. "Improved stove programs need robust methods to estimate carbon offsets." *Climatic Change*, 102(3), 641–649.

2.1.3.2 Monitoring Report Updates

Monitoring report updates refers to whether the project updates its key assumptions through successive monitoring reports.

Rationale	Key project estimates are unlikely to remain static throughout a project's lifetime. For example, factors such as the device's thermal efficiency and the level to which devices are used by the end-user will likely change over the project's lifetime. Projects that continue to test and update these assumptions through their monitoring reports will therefore ensure that the quantification remains accurate throughout the project's crediting period.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates there has been no update of key estimation factors throughout the project so far and 5 indicates regular updates.
Scoring Approach	MSCI ESG Research reviews project's monitoring reports in detail to assess the extent to which key assumptions are updated. MSCI ESG Research assesses whether three main assumptions were updated in monitoring reports: usage rate, quantity of safe water consumed, and energy required to treat 1 liter of water. For each of these assumptions, the frequency of the updates which is the number of updates of each metric compared to the amount of time since first issuance is considered, as well as the level of change in thermal efficiency over the project. Therefore, in aggregate, there are six factors considered for this metric. Each of the six factors is scored on a 1 to 5 scale.

2.1.3.3 Effective Monitoring

Effective monitoring relates to the effectiveness of a project's monitoring procedures and whether its monitoring covers a representative sample of the population.

Rationale	Effective monitoring procedures improve the accuracy of the project's quantification estimates in their monitoring reports. More effective monitoring procedures include monitoring a representative sample size of the population to maximize the likelihood of its estimates being accurate.					
Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
	☑					
Scoring Definition	Each project is scored on a 1 to 5 scale, where 1 indicates weak or unrepresentative monitoring and 5 indicates rigorous, representative monitoring of the population.					
Scoring Approach	MSCI ESG Research reviews project's monitoring reports to understand both the frequency of monitoring and the sample size of the population monitored. The overall score is then reached based on the both the frequency of monitoring and the sample size.					

2.2 Assumption Accuracy

The quantification of safe water projects relies on projects estimating multiple important assumptions. Numerous academic studies have shown that, in general, there is significant risk of projects overestimating these assumptions, with many projects being credited for more emission reductions than have been achieved in practice.

A detailed evaluation of key project assumptions is therefore required to assess the accuracy of project's quantification. These key assumptions are assessed through seven sub-criteria:

- **2.2.1 Fraction of nonrenewable biomass (fNRB):** Whether the project has accurately and conservatively estimated the fraction of nonrenewable biomass.
- **2.2.2 Quantity of Water Consumed:** Whether the project's estimate for the quantity of water consumed appear accurate and representative for the project.
- **2.2.3 Baseline Safe Water Access:** Whether the project has appropriately accounted for the proportion of the population that would have accessed safe water without boiling it.
- **2.2.4 Energy Required to Treat Water:** Whether the project has accurately and conservatively estimated the energy required to treat one liter of water.
- **2.2.5 Uncertainty Adjustments:** Whether the project makes suitable adjustments in their quantification of emissions reduction to conservatively account for key uncertainties.
- **2.2.6 Adjustment Factors:** Whether the project's adjustment factors, efficiency and conversion factors, appear accurate and reasonable.

- **2.2.7 REDD+ Double Counting:** Whether the project area overlaps with, or is close to the boundaries of, any REDD+ project areas, and therefore risks double counting any reduced deforestation due to biomass saved.

Each of the first six sub-criteria are assessed independently and scored on a 1 to 5 scale. The overall score is then calculated through an inverse weighting each of the first six factors, and then finally making any deduction due to REDD+ double counting. The inverse weighting technique ensures that very high over-estimation in one area cannot be offset by accuracy in another.

2.2.1 Fraction of nonrenewable biomass (fNRB)

This approach focuses on assessing the reasonableness of the fNRB value provided by the project to calculate its emission reductions.

The fNRB represents the proportion of woody biomass harvested unsustainably in a given area. It is expressed as a percentage, with higher values indicating a greater degree of unsustainable harvesting.

The fNRB composition of baseline biomass fuel used by target communities is difficult to estimate owing to different factors such as site of collection, type of biomass used and regional variations in forest growth. Therefore, it becomes a major source of uncertainty when quantifying CO_2 emission reductions. It is of great importance that this value has been calculated accurately and is supported by high-quality evidence.

Projects that have effectively justified their fNRB value and supported by multiple high-quality sources provide greater confidence in its accuracy. Regardless of the justification, it is then important that the fNRB value appears accurate compared to regional benchmarks, both from other similar projects and academic literature. To assess this criterion, MSCI ESG Research considers three metrics:

- **2.2.1.1 Justification:** Whether the project has effectively justified their fNRB value, supported by high-quality evidence.
- **2.2.1.2 Regional Benchmarking:** Whether the project's fNRB value appears accurate and reasonable compared to other projects in the same region.
- **2.2.1.3 Literature Benchmarking:** Whether the project's fNRB appears accurate and reasonable against key third-party academic estimates.

The scores of the 2.2.1.1 Justification and 2.2.1.3 Literature Benchmarking are aggregated and then weighted 75%, with 2.2.1.1 weighted 25% to reach an overall score from 1 to 5. A project scoring a 5 will have an fNRB value supported with strong evidence which meets or is below the regional benchmark and meets the literature standards.

2.2.1.1 fNRB Justification

fNRB Justification relates to whether the project's fNRB value has been justified and supported by high-quality sources.

Rationale	Projects providing values for fNRB which are calculated with high-quality evidence to support it are more likely to be accurate and therefore have a lower risk of overestimation. In contrast, projects which use default values and lack supporting evidence suggest greater uncertainty and risk.
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 a lack of fNRB data with no evidence provided. Projects scoring a 5 will have high quality of evidence to support this.
Scoring Approach	Key documentation for each individual project is reviewed to assess both the range and quality of evidence behind the project's fNRB estimate. The assessment of range of evidence considered the number of indicators of fNRB evaluated and described. For example, key fNRB indicators include an increase in wood scarcity, increased time traveling for wood, depleting carbon stocks in the area and increasing wood fuel prices. To assess quality of evidence for a project's fNRB value, MSCI ESG Research evaluates both the range and type of sources used. Each source used is scored based on its quality. The overall score is then based on a combination of the range and quality of evidence provided.

2.2.1.2 Regional Benchmarking

Regional Benchmarking refers to whether the project's fNRB value appears accurate and appropriate when benchmarked against similar projects located in the same region.

Rationale	Projects within similar areas will share similar characteristics and similar fNRB values. Projects that estimate an fNRB value significantly higher than comparable projects therefore have a greater risk of overestimation.
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 1, where 1 indicates the fNRB value is below the regional average and -1 indicates the project fNRB value is above the regional average.
Scoring Approach	Each individual project's fNRB assumption is compared to the country or regional average fNRB assumption for other registered cookstove and safe water projects with an MSCI Carbon Project Rating.

2.2.1.3 Academic Literature Benchmarking

Academic literature benchmarking relates to whether the project's fNRB values appear accurate and appropriate when compared to key estimates from academic literature for that region.

Rationale	Projects that have estimated fNRB values in-line with third party academic or independent estimates indicate greater accuracy and validation. In contrast, projects that use outdated or low quality academic and independent sources have a higher risk of overestimating their fNRB values. For example, the UNFCCC's historic fNRB default values were discontinued as they were found to be overestimations. Therefore, projects that estimate their fNRB value above these factors have the greatest risk of inaccuracy.
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 projects scoring significantly above both the UNFCCC default value and academic literature. A project scoring 5 indicates the value is close to academic literature and below the UNFCCC default value.
Scoring Approach	Project's fNRB assumptions are compared against a range of fNRB estimates for that region from academic literature and other institutions. Each project is then scored based on the difference between the project assumption and the average academic literature value in that region as well as the UNFCCC default value for that region.

2.2.2 Quantity of Water Consumed

Quantity of Water Consumed refers to whether the project's estimate for the quantity of water consumed appear accurate and representative for the project.

Rationale	The quantity of water consumed should be somewhat comparable between projects within the same location and against wider global benchmarks of water intake per person per day. Projects that estimate their quantity of water consumed considerably higher than the average in that country or higher than third party benchmarks therefore indicate higher risk of over-estimation. In contrast, projects using more conservative assumptions are of lower risk of inaccurately estimating carbon quantification.

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 projects which have values of quantity of water consumed significantly higher than both country project benchmarks and third-party benchmarks. Projects scoring 5 are those below or close to the average and are therefore at lower risk of overestimating.
Scoring Approach	MSCI Carbon Market's carbon projects database contains the quantity of water consumed for every registered safe water project, collected from project documents. This dataset enables easy identification of the average quantity of water consumed for each country. Further, MSCI ESG Research has built a third-party database of benchmark values for the quantity of drinking water consumed from methodology default values and country-level estimates where available, such as the IRC Wash for Bangladesh,[8] and CMP Ethiopia for Ethiopia.[9] Each individual project's quantity of water consumed is then compared to both the country project average and third-party benchmarks.

2.2.3 Baseline Safe Water Access

Baseline Access relates to whether the project has appropriately accounted for the proportion of the population that would have accessed safe water without boiling it.

Rationale	The proportion of the population that would have accessed safe water without boiling it should be somewhat comparable between projects within the same location and against country-level benchmarks on safe water access. Projects that estimate the baseline safe water access considerably lower than the average in that country or lower than third-party benchmarks therefore indicate higher risk of over-estimation. In contrast, projects using more conservative assumptions are of lower risk of inaccurately estimating carbon quantification.

Key Sources	Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets

[8] https://www.ircwash.org/sites/default/files/Milton-2006-Water.pdf

[9] https://www.cmpethiopia.org/content/download/3231/13213/file/OWNP%202008%20EFY%20ANNUAL%20REPORT.pdf

	☑	☑
Scoring Definition	Each project is scored on a scale of 1 to 5, where 1 indicates projects which have values of baseline safe water access significantly lower than both country project benchmarks and third party benchmarks. Projects scoring 5 are those above or close to the average and are therefore at lower risk of overestimating.	
Scoring Approach	MSCI Carbon Market's carbon projects database contains the quantity of water consumed for every registered safe water project, collected from project documents. This dataset enables easy identification of the average quantity of water consumed for each country. Further, MSCI ESG Research built up a third-party database of benchmark values for the quantity of water consumed from country-level estimates from the WHO and UNICEF. Each individual project's quantity of water consumed is then compared to both the country project average and third-party benchmarks for the relevant region.	

2.2.4 Energy Required to Treat Water

Energy Required to Treat Water refers to whether the project has accurately and conservatively estimated the energy required to treat 1 liter of water.

Rationale	The energy required to treat water should be somewhat comparable between projects which use the same fuel type. Projects that estimate the energy required to treat water as considerably higher than the average of projects using the same fuel type or higher than third party values have a higher risk of over-estimation. In contrast, projects using more conservative assumptions have a lower risk of over-estimating the carbon saved.

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 projects which have values of energy required to treat water significantly higher than both relevant project benchmarks and third-party default values. Projects scoring 5 are those lower or close to the average and are therefore at lower risk of overestimating.
Scoring Approach	MSCI Carbon Markets' carbon projects database contains the energy required to treat water for every registered safe water project, collected from project documents. This dataset enables easy identification of the average energy required for each fuel type. Further, MSCI ESG Research used the most up-to-date default values for this parameter from Gold Standard and CDM. Each individual project's quantity of water consumed was then compared to both the fuel type project average and default values.

2.2.5 Uncertainty Adjustment

Uncertainty Adjustment refers to whether the project makes any conservative adjustments to their emission reduction calculations to account for key uncertainties in the quantification process.

Rationale	As well as the fNRB and fuel savings, a project's emission reduction estimates require multiple other assumptions, such as the device usage rates and leakage factors. These other assumptions tend to be optional for projects to include but can ensure that projects conservatively account for additional quantification uncertainties. Projects that make deductions to their emission reductions to account for these uncertainties therefore lower the risk of overestimation.

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 5 indicates most of the uncertainty measures are included and 1 indicates there is no uncertainty adjustment.
Scoring Approach	MSCI ESG Research assess how many of the 5 key uncertainty adjustments a project has made. The five uncertainty adjustments MSCI ESG Research considers are: - **Device Usage Factor:** The proportion of time the new safe water technology is used by the end-user. - **Device Loss Rate:** The proportion of devices which will not be operational each year. - **Leakage:** The potential for emission reductions to be offset by increases outside the project boundary. - **Emission Factors:** The inclusion of only CO_2 as an emission factor. - **Adjustment Factor:** An overall uncertainty adjustment.

2.2.6 Adjustment Factors

To convert emissions impact from safe water projects into a standardized CO_2e format, the projects may need to rely on certain adjustment factors. These adjustment factors are subject to some uncertainty, and therefore projects may over/under-estimate their emissions impact through their choice of these factors.

MSCI ESG Research's approach to evaluating adjustment factors uses the following sub-criterion:

- 2.2.6.1 Emission Factors: Whether the project uses emission factors that are accurate and appropriate.
- 2.2.6.2 Charcoal Conversion Factor: Whether the project uses a wood-to-charcoal conversion factor that is accurate and appropriate.

Each of these sub-criteria is scored on a 1 to 5 scale, with the overall score reached through an equal weighting of these factors.

2.2.6.1 Emission Factors

Emission Factors relates to whether the project uses emission factors that are accurate and appropriate.

Rationale	Projects may use emission factors that are under- or over-estimated, and therefore can contribute to lower or higher risk of overestimation.

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 significant over-estimation of the relevant emission factor and 5 indicates that conservative emission factor choices have been made.
Scoring Approach	MSCI ESG Research review project documentation to determine the project's assumptions for their CO_2 and non-CO_2 emission factors. These assumptions are then compared against the standard default emission factors provided by the IPCCC to assess the degree to which they have been over or under-estimated. Note: For projects that do not include non-CO_2 emission sources, the score is only based on the CO_2 emission factor accuracy. Each project is then scored based on the level of under/over-estimation compared to the standard emission factors.

2.2.6.2 Charcoal Conversion Factor

Charcoal Conversion Factor relates to whether the project uses a wood-to-charcoal conversion factor that is accurate and appropriate.

Rationale	For projects in which charcoal is the baseline fuel type used, the wood to charcoal production ratio is a necessary input to estimate the amount of biomass used and saved by the project. Inaccurate estimates of this conversion factor can contribute to inaccuracies in the emissions impact calculation.

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 significant over-estimation of the charcoal conversion factor and 5 indicates a conservative estimation.
Scoring Approach	For projects in which charcoal is used by end-users, MSCI ESG Research review project documentation to determine the project's assumptions for their wood-to-charcoal conversion factor. This assumption is then compared against academic literature estimates. Revised IPCC guidelines state that the typical conversion factors in developing countries range from 2.5 to 3.5. However, the factor's true value can vary significantly based on location.

The score is then based on the level of under/over-estimation compared to the standardized value.

2.2.7 REDD+ Double Counting

REDD+ Double Counting refers to whether the safe water project is located within or in close proximity to any REDD+ projects, and therefore risks double counting the protection and avoided deforestation of trees within this area.

Rationale	Safe water projects ultimately create emission reductions through reducing the amount of deforestation that occurs as less fuel wood is required to be sourced to meet the household's water or heating needs. If a safe water project is located within or near a REDD+ project, which may be already protecting the local vegetation, then the avoided deforestation of that vegetation risks being double counted (i.e., used to create credits under both projects).

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 -2 to 0, where -2 indicates that the project is located within or in close proximity (<10km) to a REDD+ project and 0 indicates it is not.
Scoring Approach	MSCI ESG Research conducts geospatial analysis to compare the safe water project's location against the project locations of all registered REDD+ projects across the voluntary carbon market. This analysis then identifies whether any overlap exists between the safe water and REDD+ project boundaries.

2.3 Monitoring Performance

Monitoring performance relates to whether the project's actual emission reductions appear similar on average to their estimated emission reductions, and therefore provides support that the initial ex-ante estimates were accurate.

Rationale	Projects which have properly conducted baseline studies to estimate emission reductions (ex-ante) are more likely to achieve similar results in actual implementation. Where there is high variation between ex-ante estimates and actual issuances it suggests that a project has overestimated its emission reductions.

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 5 indicates there is a low difference between actual and estimated annual emission reductions and 1 indicates there is a great difference between actual and estimated annual emission reductions.
Scoring Approach	MSCI ESG Research assess the difference between actual and estimated emission reductions. With particular focus on projects overestimating their emission reductions. Each project is scored based on the difference in actual and estimated emission reductions is scored as shown below.

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."[10]

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.

Though the emission reductions achieved by a safe water technology cannot be later directly reversed, safe water projects do face an indirect risk of reversal. As safe water projects reduce the amount of biomass burnt for drinking purposes, they indirectly reduce local deforestation via reduced demand for fuelwood. However, any reduced deforestation is still subject to other risks to deforestation, both natural (e.g., fires) and human.

Safe water projects can, however, mitigate some of the more human-based drivers of permanence risk through effective community engagement and a well-designed maintenance and replacement plan. Under current registry methodologies, safe water projects do not compensate for this indirect permanence risk. The size of this indirect permanence risk in our integrity assessments is therefore considered.

Under current crediting program methodologies, safe water projects do not compensate for this indirect permanence risk. The size of this indirect permanence risk must therefore be assessed.

Figure 8 illustrates the sub-criteria through which MSCI ESG Research assesses the permanence of the emissions reductions achieved by safe water projects and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. The detailed sub-criteria are described in Figure 9.

[10] "Raising our ambition: Puro Standard CORCs will require 100 years minimum carbon storage," Puro Earth press release, November 9, 2022; "2023 Review of the Carbon Credits Act 2011," Climate Change Authority, December 2023.

Figure 2: Permanence integrity assessment approach

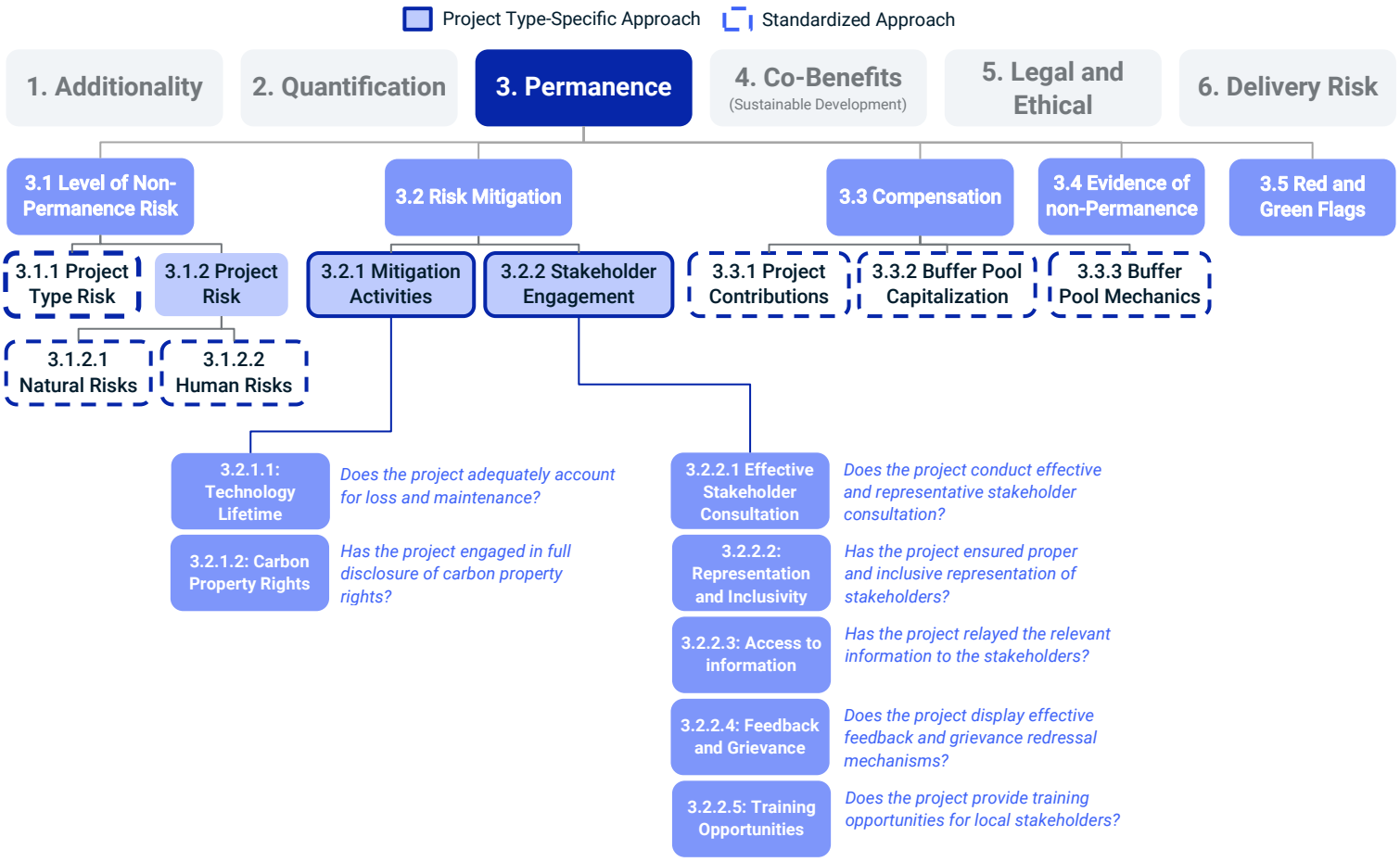


Figure 9: MSCI ESG Research Permanence integrity assessment framework

Sub-criteria		Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
3.1 Level of Non-Permanence Risk	3.1.1 Project Type Risk	Project Type Significance	Different project types have inherently different levels of non-permanence risk.	✓ *Standardized approach*									
	3.1.2 Project Risk	3.1.2.1 Natural Risks	The risk of fire, drought, landslide and other natural risks in that project area.	✓		✓					✓		✓
		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 Mitigation		3.2.1 Mitigation Activities	Projects can mitigate non-permanence risks through implementing activities that focus on addressing key risks.	✓		✓	✓	✓		✓	✓		✓
		3.2.2 Local Stakeholder Engagement	Successfully engaging with local stakeholders lowers the risk of human-based non-permanence.	✓		✓	✓	✓		✓	✓		✓
3.3 Compensation and Contributions		3.3.1 Project Contributions	A project's buffer pool contributions should appropriately account for the non-permanence risk.	✓		✓	✓	✓		✓	✓		✓
		3.3.2 Buffer Pool Capitalization	An under-capitalized buffer pool may have insufficient credits to cover future losses.	✓ *Standardized approach*									
		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 Evidence of Non-Permanence		Non-Permanence Events	If significant reversals have occurred without being accounted for, then carbon stock reversals have already occurred.	✓		✓					✓		
3.5 Red and Green Flags		News scanning	Review of academic papers, industry sources and the news for Red or Green Flags relating to project's permanence.	✓ *Standardized approach*									

3.2.1 Mitigation Activities

The actions a project takes to reduce the risk of reversal of the project are crucial in ensuring permanence throughout the project lifetime. Specifically for safe water there is a risk of reversal through the potential loss of devices throughout the project lifetime, particularly due to device breakage and efficiency drops due to lack of maintenance. This will cause the end user to revert to the use of baseline devices, increasing the risk of reversal.

Furthermore, projects which make an effort to properly communicate the rights through which users benefit from carbon credits to the end users can minimize this risk. If the end user is aware that they are under a contractual binding agreement there is a greater accountability and ownership.

MSCI ESG Research evaluates this through the following sub-criteria:

- **3.2.1.1 Technology Lifetime:** Whether the project includes a device replacement and maintenance plan to ensure devices are used throughout the project's lifetime.
- **3.2.1.2 Carbon Property Rights:** The transparency and the quality of the end-user agreements.

Each project is scored on a scale of 1 to 5 on each sub-criteria, with the overall score for 3.2.1 Mitigation Activities based on an average of these two scores. Projects scoring a 5 will represent projects which ensure the long lifetime of the safe water devices through replacement and maintenance throughout the project lifetime whilst providing information to end-users regarding carbon property rights.

3.2.1.1 Technology Lifetime

Technology lifetime refers to whether the project includes a safe water device replacement and maintenance plan to ensure the usage of improved safe water devices by a household is maximized.

Rationale	Projects that replace and maintain efficient devices increase the likelihood that improved efficiency devices will continue to be used over the project's 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 5 indicates very low risk that devices will not be used through the project's lifetime and 1 indicates very high risk of efficient devices not being used continuously due to breakage or efficiency loss.					
Scoring Approach	MSCI ESG Research assesses whether a device replacement plan is proposed and how this will reduce the risk of permanence of the project. Further, whether the project has a specific device maintenance plan in place is considered.					

3.2.1.2 Carbon Property Rights

Carbon Property Rights relates to whether carbon property rights are suitably conveyed to end-users.

Rationale	If the end-users are more aware of the terms and conditions of a carbon project, there is an increased chance that they will continue to use efficient devices, therefore reducing any permanence risk.					
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 the project provides individual end-user agreements with clear carbon property rights information and 1 indicates that no information on either end-user agreements or carbon property rights is provided.					
Scoring Approach	MSCI ESG Research assess whether the project has provided transparent end-user agreements to users, and the strength of these agreements. For strength of end-user agreement, projects that have individual end-user agreements are considered more effective.					

3.2.2 Local Stakeholder Engagement

Projects with higher levels of stakeholder engagement have a lower risk of reversal due to the community's involvement in the project. Therefore, projects putting additional resources and time into consulting the community and modifying the project to suit the end users are more likely to ensure the continued use of the project devices rather than reverting to the traditional ones.

MSCI ESG Research evaluates this through the following sub-criteria:

- **3.2.2.1 Effective Consultation:** Has the project used appropriate techniques to conduct consultations?
- **3.2.2.2 Representation and Inclusivity:** Has the project ensured proper and inclusive representation of stakeholders?
- **3.2.2.3 Access to Information:** Has the project relayed the relevant information to the stakeholders?
- **3.2.2.4 Feedback and Grievances:** Does the project display effective feedback and grievance redressal mechanisms?
- **3.2.2.5 Worker Relations:** Whether the project provides training and employment opportunities to stakeholders.

Each project is scored on a 1 to 5 scale for each of these sub-criteria and an overall score is reached through a straight average of these five scores. Projects scoring a 5 will represent projects with a detailed stakeholder consultations which are representative of the target users. These stakeholders will be informed on the project and provided with the opportunity to voice their opinions and have an influence on the project.

3.2.2.1 Effective Consultation

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

Rationale	Projects that use multiple methods of in-person consultation provide more open and effective channels to engage with stakeholders and receive any feedback. Therefore, they are more likely to take into account relevant feedback from stakeholders, and therefore design a project that will be more aligned with stakeholder interests.

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 the project conducts multiple in-person engagements and 1 indicates that very limited in-person stakeholder consultation is performed.
Scoring Approach	MSCI ESG Research assess whether both the types and in-person level of consultation conducted. The types of consultation may include surveys/questionnaires, in-person meetings, signed documents or interview calls. Projects then receive a score from 1 to 5 based on both the type and in-person level.

3.2.2.2 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 have a lower permanence risk as more of the local community are involved in the planning process. This allows more end users to voice their opinions on the project and have greater involvement.

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 the project transparently consults with a representative group of stakeholders, including women (who tend to be the largest users and beneficiaries of safe water appliances), while 1 indicates that no information is provided on which stakeholders were consulted.
Scoring Approach	MSCI ESG Research assess the number of stakeholders that a project has consulted. In particular, both the total number of stakeholders and the number of female attendees is assessed.

3.2.2.3 Access to Information

Access to Information refers to whether the project provides transparent information to stakeholders regarding the project's activities.

Rationale	Through providing greater access to information, stakeholders will be informed on the project's activities and more able to provide feedback to the project to ensure the project meets their needs.
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 the project provides access to transparent information through both documentation and in-person meetings, and 1 indicates that limited access to information is provided to stakeholders.
Scoring Approach	MSCI ESG Research assess whether in-person meetings were conducted to present project information or whether clear documentation is provided.

3.2.2.4 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	Projects are more likely to satisfy the needs of stakeholders if there is a clear feedback mechanism and projects disclose and take actions as a result of the 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 the project transparently discloses and acts on stakeholder feedback and has an ongoing feedback mechanism in place, and 1 indicates that no feedback procedure has been disclosed either at the project start or during its operation.
Scoring Approach	Three aspects of a project's feedback procedure are assessed: - **Feedback Mechanism:** Whether the project has a feedback and grievance procedure in place. - **Feedback Disclosure:** Whether the project transparently discloses any feedback received. - **Feedback Response:** Whether the project has clearly taken action on any feedback received.

3.2.2.5 Worker Relations

Worker Relations refers to whether the project provides training and/or employment opportunities to stakeholders.

Rationale	Through the provision of training opportunities there may be more community engagement and education about the project which may encourage end users to use the improved safe water devices. It may also provide benefits to the local community through increased employment opportunities and improved knowledge.

Key Sources

Project Documentation	Geospatial	Project Methodology Documentation	Academic Literature	Third-party Data	MSCI Carbon Markets
☑					

Scoring Definition	Each project is scored on a 1 to 5 scale, where 5 indicates training opportunities are provided to local stakeholders and 1 indicates there is no mention of training opportunities.
Scoring Approach	MSCI ESG Research assess whether the project will provide training opportunities for local stakeholders. In particular, if this training relates to the construction or maintenance of improved safe water devices.

Criterion 4 – Co-benefits

Co-benefits reflect the sustainable development benefits (and safeguards) of a project beyond the CO_2e it saves, in other words, its "externalities." These environmental and societal externalities are typically positive but can, on occasion, be negative.

Carbon projects have the potential to reduce/remove CO_2e, and simultaneously have a broader positive societal impact via issues such as development, adaptation and biodiversity.

Safe water projects have the potential to deliver significant positive social and environmental outcomes beyond their emissions impact. For example, the usage of safe water technologies will directly improve the health outcomes of users due to lower water-borne diseases and reduced indoor air pollution, while users may also save time and resources as they are required to source and collect less biomass. Given that women located in low-income communities are often the beneficiaries of this time saving, these benefits are highly valued.

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

Figure 10 illustrates the sub-criteria through which MSCI ESG Research assesses the co-benefits of safe water projects, and the overall MSCI Carbon Project Ratings methodology sub-criteria that they correspond to. The detailed sub-criteria are described in Figure 11.

Figure 10: Co-benefits integrity assessment approach

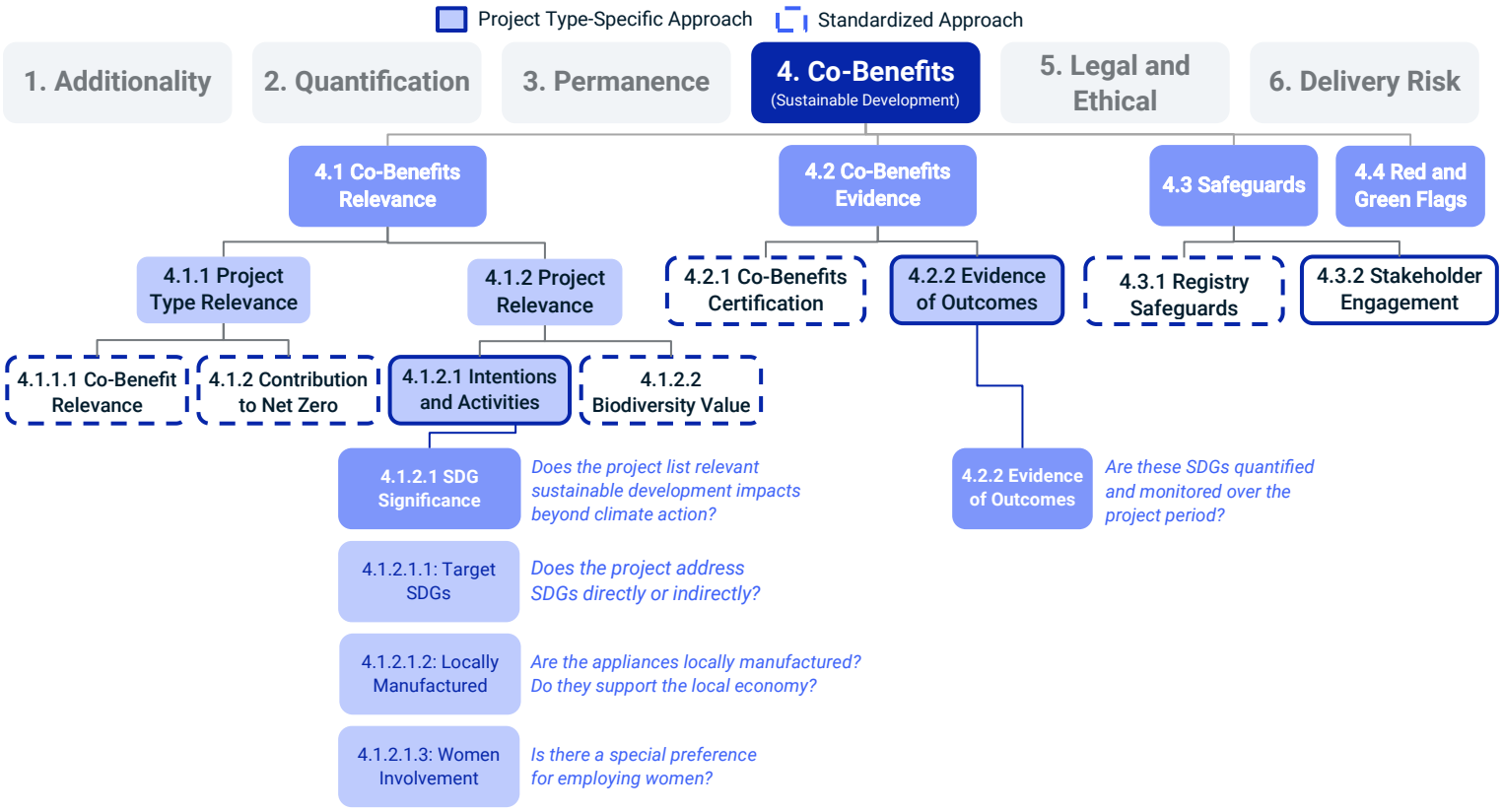


Figure 11: MSCI ESG Research Co-benefits integrity assessment framework

Sub-criteria		Metrics	Rationale	REDD+	Renewables	ARR	Cookstoves	Biochar	Landfill Gas	Safe Water	IFM	Waste Mgmt.	Blue Carbon
4.1 Co-benefits Relevance	4.1.1 Project Type Relevance	4.1.1.1 Relevance to Project Type	Different project types have an inherently different impact on each sustainable development impact.	✓ *Standardized approach*									
		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*									
	4.1.2 Project Relevance	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.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		4.1.2.2 Biodiversity Value	Nature-based projects that enhance or protect areas of rich biodiversity have greater environmental value.	✓		✓					✓		✓
4.2 Co-benefits Evidence		4.2.1 Certification	Achieving certification involves more stringent project verification. This improves the likelihood that a project's co-benefits have been realized.	✓ *Standardized approach*									
		4.2.2 Evidence of Outcomes	Projects can increase the confidence that co-benefits are attributed to their actions through measuring, monitoring, and quantifying the outcome.	✓		✓	✓	✓		✓	✓		✓
4.3 Safeguards		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 Red and Green Flags		News scanning	Review of academic papers, industry sources and the news for Red or Green Flags relating to project's co-benefits.	✓ *Standardized approach*									

4.1.2.1 Project Intentions to Activities

While safe water projects may typically create a range of inherent social and environmental benefits, the significance of these co-benefits is clearly impacted by the project's design and implementation. Projects that more explicitly target certain impacts increase the relevance and significance of these impacts.

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

- **4.1.2.1.1 Target Impacts:** The social and environmental benefits that the project explicitly identifies and targets.
- **4.1.3.2 Water-related Illnesses:** Whether the project takes place in a country in which a significant proportion of illnesses and deaths come from lack of access to safe water.
- **4.1.2.1.2 Local Manufacturer:** Whether improved safe water devices are manufactured locally.
- **4.1.2.1.3 Involvement of Women:** Whether local women are involved in core project activities, such as being provided with employment opportunities.

Each project is scored on a scale of 1 to 5 based on an addition of the individual scores for these four metrics. Projects which are located in areas with significant health problems due to lack of safe water, local people in the manufacturing of the safe water technologies and actively seek gender equality within the project while achieving sustainable development outside of climate action will score the maximum of 5.

4.1.2.1.1 Target Impacts

Target Impacts refers to whether the project explicitly or implicitly targets specific SDGs with their project activities.

Rationale	Projects which implement specific activities targeted at an SDG increase the likelihood that this SDG is relevant.					
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's activities do not target any sustainable development impacts and 5 indicates the project's activities targets seven or more sustainable development impacts.					
Scoring Approach	MSCI ESG Research identifies the number of SDGs explicitly and implicitly mentioned and targeted by the project. For projects that do not refer to SDGs, MSCI ESG Research identifies all the sustainable development impacts mentioned by the project (such as reduced time collecting fuel wood, improved air pollution and local economic development). The overall score is then based on the total quantity of SDGs or sustainable development impacts identified by the project.					

4.1.2.1.2 Water-related Illnesses

Water-related Illnesses refers to whether the project takes place in an area where a significant proportion of illnesses and deaths come from lack of access to safe water.

Rationale	The most direct co-benefit impact of safe water projects is improved health outcomes, as improving access to safe water directly supports better health. Projects which take place in areas in which the lack of access to safe water contributes to a significant proportion of illnesses and deaths will have a potentially greater impact.

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 0 to 1, where 0 indicates that water-related illnesses in the country are relatively low, 0.5 indicates that water-related illnesses are in-line with other developing countries, and 1 indicates that water-related illnesses are particularly significant in that country.
Scoring Approach	MSCI ESG Research use data from the UN to assess the prevalence of water-related illnesses and deaths in each country.[11] Countries are then benchmarked against each other to identify whether the country suffered from particularly high levels of water-related illnesses. Each project is then scored based on the level of water-related illnesses present in their country, and the relative scale of water-related illnesses compared to both a regional and global average as follows:

[11] https://www.unwater.org/our-work/sdg-6-data-portal

4.1.2.1.3 Local Manufacturer

Local Manufacturer relates to whether the devices are manufactured locally, and therefore directly support the local economy.

Rationale	Projects which manufacture devices locally more directly impact social benefits such as supporting local employment and training. Therefore, they increase the relevance and significance of certain SDGs. In contrast, projects that do not manufacture devices locally will have a lower impact.
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 0 to 0.5, where 0 indicates that devices were imported or not manufactured locally and 0.5 indicates there is clear evidence that devices were manufactured locally.
Scoring Approach	MSCI ESG Research assess whether the safe water appliances were constructed locally (either in full, or from imported parts) or imported from other locations.

4.1.2.1.4 Involvement of Women

Involvement of women relates to whether the project directly involves women in the project's core activities, such as through employment.

Rationale	One of the biggest potential co-benefit impacts of safe water projects is contributions to women's empowerment and gender equality. Projects which actively involve women in key project activities increase the gender impact potential of the projects.
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 0 to 0.5, where 0 indicates no specific evidence of women employment and 0.5 indicates there is a clear effort to provide equal work opportunities to women in the project area.
Scoring Approach	MSCI ESG Research assess how women are involved in the project's activities. Focusing on if there is mention of equal employment opportunities for women or if the number of female employees was included in project documentation.

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 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
	☑					
Scoring Definition	Each project is scored on a scale of 1 to 5, where 1 indicates there is no quantification or monitoring of sustainable development impacts and 5 indicates that benefits are quantified and monitored.					
Scoring Approach	MSCI ESG Research assess the level to which co-benefits have been quantified and/or monitored within a project's monitoring reports.					

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