CLIMATE CHANGE

46/2020

Indicators for the promotion of sustainable development in carbon market mechanisms

Final report

German Environment Agency

Umwelt Bundesamt

CLIMATE CHANGE 46/2020

Ressortforschungsplan of the Federal Ministry for the
Enviroment, Nature Conservation and Nuclear Safety

Project No. (FKZ) 3718 42 007 0
Report No. FB000345/1,ENG

Indicators for the promotion of sustainable development in carbon market mechanisms

Final report

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Imprint

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Report completed in:
June 2020

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Publication as pdf:
http://www.umweltbundesamt.de/publikationen

ISSN 1862-4804

Dessau-Roßlau, November 2020

Abstract: Indicators for the promotion of sustainable development in carbon market mechanisms

This report assesses options for the effective implementation of sustainable development impact assessment, in the context of climate change mitigation mechanisms such as those of Article 6 of the Paris Agreement. Existing carbon crediting programmes were analysed to draw insights on the best approaches for sustainable development impact assessment and the use of indicators.

The requirements of sustainable development assessment cannot be generalised, but rather the appropriate complexity, rigour and granularity should depend on the rationale of the programme with regards to the intended use of the assessment results and potential commodification of outcomes. More complex and rigorous approaches to sustainable development impact assessment may help to improve understanding of the project impact, but may also result in additional transaction costs that could be unnecessary for some purposes.

From the analysis of existing project-level indicators for sustainable development impact assessment, we derive lessons and pragmatic solutions for the effective use of indicators and measures to decrease complexity and associated transaction costs while safeguarding a reliable assessment of the sustainable impact of activities. This includes a discussion on the provision of flexibility in MRV approaches, as well as the identification of potential links to internationally accepted benchmarks and accessible data sources, amongst other solutions. We set out a criteria based checklist for the formulation of objective and comparable indicators and assess whether existing indicators can be optimized with regards to their specificity and the type of expression in their formulation.

Lastly, we assess approaches for safeguarding against potential negative impacts, finding that stakeholder consultation and grievance mechanisms are essential to identify and respond to unforeseen negative impacts, and that pre-defined indicators are useful yet not alone sufficient towards that objective.

Kurzbeschreibung: Indikatoren zur Förderung einer nachhaltigen Entwicklung im Rahmen von Marktmechanismen

Dieser Bericht wertet Möglichkeiten aus, wie die Bewertung von Beiträgen zur nachhaltigen Entwicklung im Rahmen von Klimaschutzmechanismen wie jenem aus Artikel 6 des Übereinkommens von Paris effektiv umgesetzt werden können. Dazu werden Ansätze, die in bestehenden Programmen Verwendung finden, analysiert und ausgewertet, um schließlich den geeignetsten Ansatz für die Bewertung von Nachhaltigkeitsbeiträgen und die Verwendung von Indikatoren zu ermitteln.

Die Anforderungen an die Bewertung von Beiträgen zur nachhaltigen Entwicklung können nicht verallgemeinert werden. Welche Anforderungen an Komplexität, Genauigkeit und Granularität gestellt werden müssen, hängt vielmehr vom jeweiligen Zweck einer solchen Bewertung ab. Komplexere und detailliertere Ansätze fördern ein besseres Verständnis über die Nachhaltigkeitsbeiträge eines Projekts, sie können jedoch auch zu zusätzlichen Transaktionskosten führen, die abhängig vom jeweiligen Zweck einer Bewertung vermeidbar wären.

Basierend auf den Ergebnissen der Analyse von bestehenden Nachhaltigkeitsindikatoren auf der Projektebene ziehen wir Lehren für den effektiven Einsatz von Indikatoren. Wir identifizieren pragmatische Lösungsansätze, welche die Komplexität und die damit verbundenen Transaktionskosten reduzieren können und gleichzeitig die Reliabilität einer jeden Bewertung gewährleisten. In diesem Rahmen diskutieren wir unter anderem das mögliche Maß an Flexibilität in MRV-Ansätzen sowie die Vorzüge der Verwendung von international anerkannten Bezugsgrößen (*Benchmarks*) und zugänglichen Datenquellen. Des Weiteren erstellen wir eine Checkliste für die Konzeption von objektiven und vergleichbaren Indikatoren und geben

Empfehlungen für die Optimierung von bereits bestehenden Indikatoren hinsichtlich ihrer Formulierung und Spezifität.

In der abschließenden Auseinandersetzung mit verschiedenen Ansätzen zu Schutzmaßnahmen vor möglichen negativen Auswirkungen (*Safeguards*) stellen wir fest, dass die Konsultation von Interessengruppen sowie die Einrichtung von Beschwerdemechanismen unerlässlich sind. Beide Maßnahmen tragen dazu bei unvorhergesehenen negativen Auswirkungen rechtzeitig zu identifizieren und diesen entgegensteuern zu können. In diesem Kontext können vordefinierte Indikatoren zwar hilfreich sein, sind aber allein keinesfalls ausreichend.

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AF	Adaptation Fund
CDM	Clean Development Mechanism
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CENDOR	Centre for Women's Research
CCBS	Climate, Community & Biodiversity Standards
CO_2	Carbon Dioxide
COP	Conference 11ft he Parties
EIA	Environmental Impact Assessment
FREL	forest reference level
GCF	Green Climate Fund
GHG	Greenhouse gas
GS	Gold Standard
GS4GG	Gold Standard for Global Goals
ICAT	Initiative for Climate Action Transparency
IFC	International Finance Corporation
ILO	International Labour Organization
LULUCF	Land Use, Land Use Change and Forestry
MAAP	Mitigation Action Assessment Protocol
MRV	Monitoring, Reporting and Verification
NCB	Non-Carbon Benefits
NDC	Nationally Determined Contributions (in Paris-Agreement)
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SD VISta	Verra's sustainable development VISta standard
SEIA	Socio-Economic Impact Assessment
SIS	Safeguard Information Systems
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard

Summary

In 2015, all member states of the United Nations agreed on objectives to shift economies and societies toward sustainable and decarbonised development through the adoption of the Agenda 2030 on the Sustainable Development Goals and the Paris Agreement on limiting climate warming to well below 2°C. Both agendas, although negotiated under different multilateral processes, are highly interlinked. The Agenda 2030 sets out 'Climate Action' as one of the 17 officially agreed SDGs and the Paris Agreement refers to sustainable development a total of 12 times. Article 6 of the Paris Agreement introduced ambition raising mechanisms through cooperative approaches, involving options for the potential transfer of climate change mitigation outcomes between states. Through this Article, Parties shall promote and support sustainable development when they engage in cooperative market approaches.

From previous and existing market-based climate change mitigation mechanisms and project crediting programmes, there remains a limited, though increasing, body of knowledge on the effective implementation of sustainable development indicators in these contexts.

The key objective of this report is to advance and disperse knowledge on the options for the effective implementation of sustainable development impact assessment indicators, in the context of climate change mitigation mechanisms such as those of Article 6 of the Paris Agreement. The report addresses the following research questions:

- Why do programmes assess sustainable development impacts for climate change mitigation project market mechanisms? (section 2)
- What programme-level approaches for sustainable development impact assessment are most effective, for which purposes? (section 3)
- What are effective criteria to measure sustainable development impact? (section 4)
- What are improved approaches for implementing sustainable development indicators? (section 5)
- What are the most effective approaches for safeguarding against negative impacts? (section 6)

To address these questions, we provide an analytical overview of how the most prominent programmes approach sustainable development impact assessment, including an analysis of 217 project-level indicators and the official SDG indicators. Programmes covered by our analysis are Gold Standard for Global Goals, Verra's sustainable development VISta standard (SD VISta), UN REDD+ Social and Environmental Safeguards/UN REDD+ Cancun safeguards and World Bank's Mitigation Action Assessment Protocol (MAAP) as well as indicators from Verra's Climate, Community & Biodiversity Standards (CCB), the ICAT Sustainable Development Guidance and the UNDP Climate Action Impact Tool.

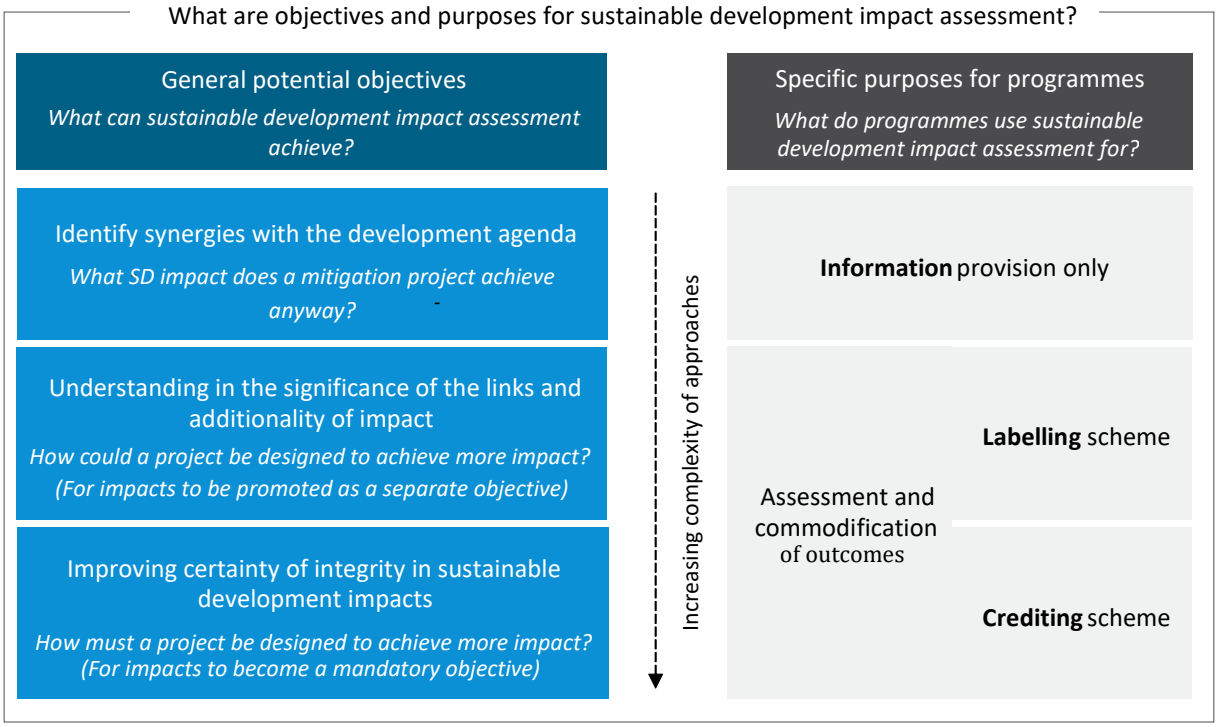
Why do programmes assess sustainable development impacts for climate change mitigation project market mechanisms?

Section 2 provides an overview of the different general potential objectives and programme-specific uses of sustainable development impact assessment. As a starting point we consider – what is a realistic objective of the use of sustainable development indicators? – given that it is not possible to objectively quantify all sustainable development impacts in a single metric, succinctly, – what, specifically, should the use of sustainable development indicators achieve? – and, – what trade-offs may be incurred in trying to achieve these objectives?

The assessment of sustainable development impacts can be highly beneficial for further optimising project outcomes, if appropriately designed. Sustainable development impact assessment can facilitate not only a better understanding of the impact of climate change mitigation projects for sustainable development outcomes but can also incentivise the maximisation of those outcomes. This can help climate change mitigation targets ensure that they are better aligned with the national development agenda and can also help to attract more financial support for their implementation. Voluntary market actors, in particular, have shown interest to target such projects, and are willing to pay a premium for those sustainable development outcomes.

Analysis of existing programmes shows that the practical rationale of the sustainable development impact assessment varies. Such assessments can be conducted for *information provision only*, or can be done for commodification of the outcomes, either through a form of *labelling* or *crediting*. Programmes should be carefully designed to ensure that the approach taken provides the right level of incentive for appropriate sustainable development impact assessment, in order to realise the potential rationale for the assessment. Awareness of sustainable development impacts can facilitate projects to adjust their designs to maximise those outcomes, even if those outcomes are not explicitly commodified by programmes. This, however, requires that incentives are in place to consider those links already at the project planning stage. We have identified realistic objectives for the use of sustainable development indicators, the most important trade-offs, and the specific purposes of programmes, as summarised in Figure S1.

Figure S1: Overview of general objectives and specific purposes of sustainable development impact assessment



Source: Authors' own elaboration.

What programme-level approaches for sustainable development impact assessment are most effective, for which purposes?

Section 3 of this report provides an analytical overview of how the most prominent climate change mitigation mechanism programmes approach sustainable development impact

assessment to determine the most appropriate sustainable development impact assessment approaches for different purposes. This includes analysis of approaches for assessing sustainable development impacts (section 3.2.1), approaches for monitoring, reporting and verification of indicators (section 3.2.2) and consequences of non-compliance with rules and requirements (section 3.2.3).

The rigour, and granularity of assessments should be as simple as possible, while providing the detail and accuracy necessary for the specific purpose. In our assessment, we find that the requirements of sustainable development assessment cannot be generalised but depend on the rationale. Unlike emission reduction monitoring, which involves a single indicator that is objectively defined, "sustainable development" is an umbrella term for a potentially infinite number of indicators, not all of which can be objectively defined the same way. The development of a perfectly objective and all-inclusive sustainable development impact assessment is not possible and should not be the aim. Some purposes may require more stringency, accuracy and detail than others, which can somewhat justify the resulting trade-offs for resource expenditure. While a perfect assessment is not possible, a conscious decision should be made on the balance between rigour and pragmatism for the assessment approach, with the stringency informed by the purpose of the assessment.

In the case of informational uses, a 'simple identification of potential impacts' approach may be sufficient as it can provide an enhanced understanding of the links to the development agenda without incurring significant transaction costs due to related complexity of the assessment. However, if sustainable development benefit assessment is carried out to commodify the outcome, either by labeling GHG credits or creating standalone sustainable development impacts credit, proving certainty of claims is indispensable. In such cases *assessment of impacts against a baseline* should be necessary to provide the most clarity and certainty. Similarly, **the intended use of the sustainable development impact demonstration (i.e. for information, labelling, crediting) has clear implications on the design of the MRV system.** For informational purposes, self-reporting and self-evaluation could be sufficient depending on the required quality and comparability of the information provided. In other cases, a more structured MRV procedure with second- or third-party scrutiny might be required (and internalised in the commodity price). Programmes should be carefully designed to ensure that the approach taken provides the right level of incentive for appropriate sustainable development impact assessment, in order to realise the potential rationale for the assessment.

In section 3.3, two case studies from VCS with CCBS and the Gold Standard illustrate how different assessment approaches are being used to demonstrate sustainable development impacts using indicators. Both cases underscore that a structured and comprehensive approach towards indicators for sustainable development impact demonstration can indeed contribute to improving the understanding of synergies with the development agenda. However, both projects also show that enhanced demonstration of sustainability does come with extra transaction costs for highlighting specific impacts.

What are effective criteria to measure sustainable development impact?

Section 4, provides an overview of the status-quo regarding the availability of indicators for sustainable development impact assessment at the project level – including the official SDG indicators – and assesses the effectiveness of these indicators. Based on this analysis, we identify criteria to maximise the effectiveness of indicators.

We first compiled and reviewed a list of 217 project-level indicators from different existing programmes to identify what types of issues undermine an indicators' ability to effectively deliver on the objectives for sustainable development impact assessment.

We identified the following potential issues:

1. **Indicators may be vague and not refer to specific outcomes**, which makes it difficult to understand exactly what the link is, or to assess it with any degree of accuracy.
2. Even in the case that a specific outcome or impact is referred to, for some indicators, **there may not be an apparent direct link to the project-level** which can assist in drawing a conclusion regarding a cause-and-effect relationship.
3. **Some indicators are not conducive to the use of quantitative metrics**, which detracts from the ability to accurately assess the impact in a transparent way.
4. **Some indicators are highly complex and appear to require either significant amounts of data** from third-parties, or calculations that would involve assumptions. This could represent an increased burden in order to monitor the indicators; and
5. **Indicators may also involve issues that some may see as politically sensitive**, which can detract from the ability to implement them in a practical context.

These five issues are considered in greater detail in the context of the objectives for sustainable development impact assessment to define criteria for effective indicators. An overview of the identified criteria and how they are relevant for each of programmes' purposes is given in Table S1.

Table S1: Relation of criteria and purposes of programmes

		Assessment for commodification	
	Assessment for informational purposes	**Labelling**	**Credeting**
Criteria to address general objectives for sustainable development impact assessment in indicators			
Criterion 1: The indicator refers to a specific individual outcome.	Fulfilment of the criteria is **essential** for the purpose.		
Criterion 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.	Fulfilment of the criteria is **beneficial and usually important** for the purpose.	Fulfilment of the criteria is **beneficial and usually important** for the purpose.	Fulfilment of the criteria is **essential** for the purpose.
Criterion 3: The indicator is a quantitative metric.	Fulfilment of the criteria is **beneficial but not always prioritised.**	Fulfilment of the criteria is **beneficial and usually important** for the purpose.	Fulfilment of the criteria is **essential** for the purpose.
Criterion 4: The indicator can be determined without calculations which require input assumptions.	Fulfilment of the criteria is **beneficial but not always prioritised.**	Fulfilment of the criteria is **beneficial and important** for the purpose.	Fulfilment of the criteria is **beneficial** for the purpose and a question of quality.
General trade-offs to be avoided			
Criterion 5: The complexity of the MRV is manageable.	Fulfilment of the criteria is up to the individual project but will result in lower costs.		

	Assessment for commodification		
	Assessment for informational purposes	**Labelling**	**Credeting**
Criterion 6: The indicator can be monitored with own information and data.			
Criterion 7: The indicator should relate to specific targets of the SDGs.	Fulfilment of the criteria is required to decrease risk of political sensitivity.		
Criterion 8: The indicator directly relates to national legislation or international treaties.	Fulfilment of the criteria is beneficial for decreasing the risk of political sensitivity.		

Source: Authors' own elaboration.

Evaluating the official SDG indicators against the identified criteria, we find that **the SDGs themselves are highly relevant as a framework for sustainable development impact assessment, but the indicators are only partially applicable to project-related activities.** The breadth of the synergies between mitigation project activities and the achievement of the SDGs, along with the universal acceptance of the SDG as markers for sustainable development, make it highly appropriate to consider the impact towards SDG targets when defining indicators for sustainable development impact assessment at the project level. Depending on the project, some SDG indicators are directly applicable as project-level impact indicators (~4%), but most of the SDG indicators are relevant at the macro level and are either not applicable for measuring project-level impact or can only be used on the project-level through proxy indicators (~30%).

From the 217 relevant project-level indicators that were identified from the literature and existing programmes, most of these existing indicators exhibit a number of drawbacks that would prevent the indicators from being able to fully deliver on the full range of potential objectives for sustainable development impact assessment. Only few of the indicators meet all the criteria that we identified for indicators to effectively meet the set objectives. In some cases, this may be by design since not all the potential objectives are relevant for all programmes and purposes. Furthermore, developing indicators and approaches to meet all objectives can lead to higher resource expenditures and transaction costs for monitoring, reporting and verification.

What are improved approaches for implementing sustainable development indicators?

Section 5 looks into a demonstrative selection of indicators in more detail, developing specific recommendations for the optimisation of those indicators and approaches for the implementation of monitoring, reporting, and verification, in order to derive general recommendations for improving the use of indicators.

Pragmatic solutions can improve sustainable development impact assessment without increasing complexity. Whatever level of assessment rigour is deemed most appropriate to fulfil the objectives of a project or crediting programme, our analysis of existing sustainable development indicators shows that some criteria and quick-wins can be identified (see table below) which improve the effectiveness of those indicators, without necessarily increasing the complexity of the assessment approach.

- **Indicator definitions should be specific enough to ensure that there cannot be multiple interpretations of 'the indicator'**. With regard to monitoring and verification, a

specific definition offers more clarity on the different measurement and verification approaches available, with efficiency gains from replication at a greater scale. At the point of reporting and communication, specific definitions ensure comparability and avoid misinterpretation. Specific indicator definitions do not compromise flexibility for the project developer since there can still be flexibility in the available approaches for monitoring, and project developers can still be free to select and use other indicators that are more appropriate to their context.

- **One-dimensional indicators should be used when possible to ensure comparability and reduce costs**. A complexity that we observed in the evaluation of indicators was that one can draw a distinction between indicators which are a "simple" measurement of one specific outcome (one-dimensional) (e.g. *number of women employed under the action*), and indicators which appear to be more "complex" in a way that they combine more than one measurement within one indicator (multi-dimensional), often combining both an assessment of the quantity and the quality of the outcome in one metric (e.g. *total number of people for whom access to, or quality of, education is expected to improve*; where the degree of improvement that qualifies under the indicator is a secondary measurement to the number of people). Multi-dimensional indicators provide incomplete data that can hide information, obscure cause and effect relationships, and lead to misinterpretations. When sustainable development impacts are credited, however, comparability of information is essential, so multi-dimensional indicators are not suitable. Further, multi-dimensional indicators can require additional processes for monitoring and reporting including on a larger geographic scope, which may require a higher level of accuracy than the processes for one-dimensional indicators in order to be meaningful. Multi-dimensional indicators can provide more context and increase policy relevance. However, the provision of this context requires additional definitions within the indicator that can be politically sensitive.

- **Indicators should be expressed in absolute terms.** Absolute figures are required to report the impact of the activity on project level. Reporting on proportional indicators can only be applied on project level if aggregated numbers for the region or country level are available, this will complicate the MRV for the project developer. Absolute figures will further increase the comparability and ease the verification.

While these steps can be taken to increase the effectiveness of indicators, not all issues associated with sustainable development impact assessment can be easily solved. Striving to achieve an extremely high level of robustness for a sustainable development impact assessment will likely result in significant complexity and costs. While there are no perfect solutions for the complete removal of these complexities, the following success factors, identified from the experiences of existing programmes, may reduce them.

- **Structured approaches to monitoring and verification could include various flexibilities** which allow adapting to specific contexts and capacities. It is usually possible to offer a flexible range of approaches, which provide a reliable indicator of a trend and a scale of order magnitude, sufficient for most purposes of sustainable development impact assessment.

- **In order to reduce complexity and transaction costs, the measuring of the indicators could allow the use of national and international default values and standards**, where measured figures are not available (or only with comparatively unreasonable efforts). This could be done in a tiered approach as appropriate.
- **Reliable and accessible data sources are crucial** for the successful implementation of indicators. The source and justification of all data should be documented. Collaboration with international verifier organisations can help overcoming problems with unreliable or missing data**.**
- **MRV systems need to include a management framework** at the institutional and organisational level **that provides clear responsibilities for each actor.** This reduces the risk of unsuccessful implementation.

What are the most effective approaches for safeguarding against negative impacts?

Section 6 looks at the safeguards that programmes have put in place to ensure that projects "do no harm" and provides an overview of commonly used themes for safeguarding principles and common practices to enforce them.

Stringent safeguards are required to control for potential negative impacts for sustainable development outcomes. While the assessment approach for the demonstration of positive sustainable development impacts should be determined based on the objectives of the specific programme, the analysis also showed that regardless of the approach taken, it is of key importance that this is complemented by stringent safeguards against potential negative impacts. All the programmes assessed in this research recognise the importance of safeguarding against negative impacts and have put processes in place to address this issue.

Indicators can play an important role in safeguarding against negative impacts, as we have indicated in section 6.3. However, pre-defined indicators alone cannot control for all safeguarding principles, since negative impacts do not only affect a series of pre-defined conditions, but rather approaches are needed to address any number of potential negative impacts which may arise unexpectedly. In particular, stakeholder engagement and grievance mechanisms with clear communication channels at the project-level were noted to be important elements of ensuring that potential negative impacts can be identified and addressed.

Compared with the development of indicators to assess positive sustainable development impacts, there appears to be less of a case for a rigid and structured definition of indicators to address safeguards against negative impacts. However, our analytical overview of existing approaches leads us to the conclusions that adopting thorough modalities and processes for identifying and avoiding, minimising, and mitigating negative impacts should be stringent requirements for any programme, regardless of the level of stringency that is determined as most appropriate for the assessment of positive sustainable development impacts.

Further research to support the design of programmes in the international negotiations

The analysis took the starting point that there are many different potential purposes of sustainable development impact assessment – including for information only, or for the commodification through labelling or crediting programmes – while the merits of those different purposes were outside of the scope of analysis. Since a key finding of this study is that there is no single optimal approach for sustainable development impact assessment, but rather that the approach should be defined by the purpose, then the merits of those purposes becomes a very relevant question, which could be picked up in further research. For example, do the different purposes for sustainable development assessment – for information only, labelling, and

crediting – all result in an increased awareness of the importance of sustainable development benefits, and the optimisation of these outcomes? Does the degree of that benefit differ? Approaches that require higher transaction costs may leave fewer resources available for investing in further action; it should be considered whether or not the incentives provided by labelling and crediting programmes, which require more resource intensive assessments, lead to more efficient resource expenditure to make up for this.

Addressing the issue of safeguards against potential negative impacts, this analysis focused primarily on demonstrating the potential role of indicators to inform such impacts. However, we also found that the use of indicators alone is not sufficient to identify, avoid, minimise, and mitigate all potential negative impacts, and that modalities and processes need to be put in place to address this flexibly – such as project-level grievance mechanisms. As a next step, it would be useful to determine more precisely what should be minimum requirements of those processes, and whether it would be feasible and attractive for all mechanisms to adopt uniform standards in this regard.

With the ongoing discussions on Article 6 of the Paris Agreement, there is an important opportunity to learn from the experiences of existing and historical programmes for market-based mechanisms. While exact details for approaches for sustainable development impact assessment and safeguards may not be taken up in the eventual text governing Article 6 for the Paris Rulebook, it is important that the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) provides a clear mandate for further details to be established under a workplan in subsidiary body discussions. In a parallel publication – *Indicators for sustainable development under Article 6 of the Paris Agreement* (forthcoming) – we explore the current state of these negotiations considering their historical context, chart out scenarios for where these negotiations may lead to, and provide suggestions for next steps including a draft work plan for such discussions.

Zusammenfassung

Im Jahr 2015 einigten sich die Staats- und Regierungschefs der Mitgliedstaaten der Vereinten Nationen auf Zielsetzungen, die auf eine nachhaltige und treibhausgasarme Entwicklung aller Volkswirtschaften und Gesellschaften gerichtet sind. Zum einen durch die Annahme der Agenda 2030 für nachhaltige Entwicklung und zum anderen durch die Unterzeichnung des Übereinkommens von Paris zur Begrenzung der Erderwärmung auf deutlich unter 2 Grad Celsius. Die beiden internationalen Vereinbarungen wurden zwar im Kontext unterschiedlicher multilateraler Prozesse ausgehandelt, sind jedoch stark miteinander verknüpft: In der Agenda 2030 werden beispielsweise "Maßnahmen zum Klimaschutz" als eines der 17 offiziell vereinbarten Ziele für nachhaltige Entwicklung (Sustainable Development Goals (SDG)) aufgeführt. Das Übereinkommen von Paris fordert die Bemühungen um einen globalen Klimaschutz noch stärker mit den Zielen nachhaltiger Entwicklung zu verbinden. Artikel 6 des Übereinkommens etabliert die Förderung von nachhaltiger Entwicklung als eines der Hauptziele einer jeden internationalen Zusammenarbeit, die den Transfer von Minderungsleistungen zum Ziel hat. Durch diesen Artikel sollen die Vertragsparteien bei der direkten zwischenstaatlichen Zusammenarbeit in Form von "cooperative approaches" nachhaltige Entwicklung fördern. Basierend auf früheren sowie fortlaufenden marktbasierten Mechanismen zur Eindämmung des Klimawandels und anderen Zertifizierungsprogrammen existiert nur ein begrenztes - wenn auch zunehmendes - Wissen über den wirksamen Einsatz von Nachhaltigkeitsindikatoren in diesem Kontext.

Das Hauptziel dieses Berichts besteht daher darin, das Wissen über die effektive Umsetzung von Nachhaltigkeitsindikatoren im Kontext von Klimaschutzmechanismen, wie beispielsweise Artikel 6 des Übereinkommens von Paris, zu vertiefen und zu verbreiten. Der Bericht setzt sich mit den folgenden Forschungsfragen auseinander:

- Warum bewerten Programme die Beiträge zur nachhaltigen Entwicklung von Klimaschutzprojekten in Marktmechanismen? (Kapitel 2)
- Welche Ansätze zur Bewertung von Beiträgen zur nachhaltigen Entwicklung sind am effektivsten, und für welchen Zweck? (Kapitel 3)
- Welches sind die wirksamsten Kriterien zur Bewertung von Beiträgen zur nachhaltigen Entwicklung durch Indikatoren? (Kapitel 4)
- Wie sehen verbesserte Ansätze zur Anwendung von Nachhaltigkeitsindikatoren aus? (Kapitel 5)
- Welches sind die effektivsten Ansätze zur Absicherung vor negativen Auswirkungen? (Kapitel 6)

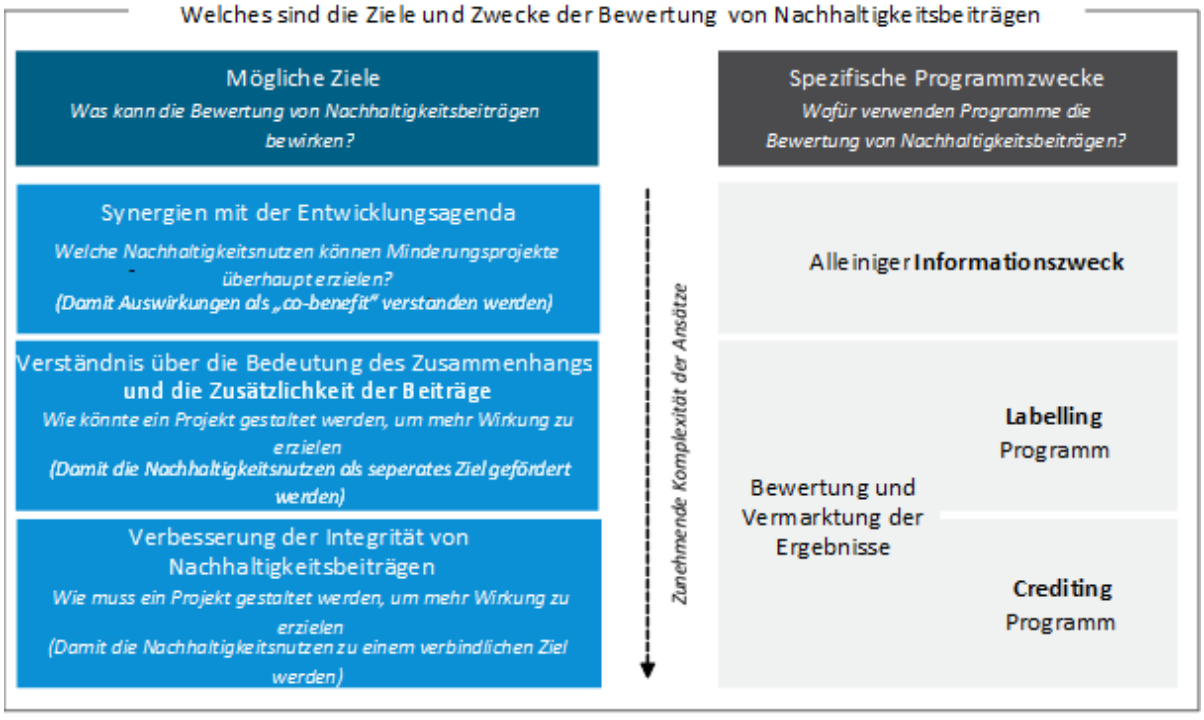
Um diese Fragen zu beantworten, geben wir einen analytischen Überblick über die Ansätze verschiedener Programme zur Bewertung von Beiträgen zur nachhaltigen Entwicklung. Dies schließt die Analyse von 217 Indikatoren auf Projektebene sowie der offiziellen SDG-Indikatoren ein. Die Analyse deckt die folgenden Programme ab: *Gold Standard for Global Goals*, *Verra's sustainable development VISta standard (SD VISta)*, die *UN REDD+ Social and Environmental Safeguards/UN REDD+ Cancun safeguards* und das *Mitigation Action Assessment Protocol (MAAP)* der Weltbank sowie Indikatoren aus *Verra's Climate, Community & Biodiversity Standards (CCB),* der I*CAT Sustainable Development Guidance* und dem *UNDP Climate Action Impact Tool.*

Warum bewerten Programme die Beiträge zur nachhaltigen Entwicklung von Klimaschutzprojekten in Marktmechanismen?

Kapitel 2 gibt einen Überblick über die allgemeinen sowie programmspezifischen Ziele der Bewertung von Beiträgen zur nachhaltigen Entwicklung. Unsere Ausgangsfrage ist hierbei: *Welches sind realistische Ziele für die Verwendung von Nachhaltigkeitsindikatoren*? Da es nicht möglich ist, den gesamten Beitrag zur nachhaltigen Entwicklung in einer Metrik objektiv zu quantifizieren, folgen wir weitergehenden Fragen - *was sollte die Verwendung von Nachhaltigkeitsindikatoren konkret bewirken?* – und, *welche Zielkonflikte könnten dabei auftreten*? Bei entsprechender Gestaltung kann die Bewertung von Nachhaltigkeitsbeiträgen für Projekte von großem Nutzen sein. Sie fördert nicht nur ein besseres Verständnis über die Beiträge von Klimaschutzprojekten zur nachhaltigen Entwicklung, sondern schafft auch Anreize für die Maximierung dieser Nachhaltigkeitsbeiträge. Dies fördert, dass Klimaschutzziele besser auf nationale Entwicklungsziele abgestimmt sind, und zusätzliche finanzielle Unterstützung für ihre Umsetzung gewonnen werden kann. Insbesondere Akteure des freiwilligen Marktes haben Interesse an solchen Projekten gezeigt und sind bereit für zusätzliche Beiträge zur nachhaltigen Entwicklung einen höheren Preis zu zahlen.

Die Analyse bestehender Programme zeigt, dass die Bewertung von Beiträgen zur nachhaltigen Entwicklung ganz unterschiedliche praktische Gründe haben kann. Solche Gründe sind beispielsweise die reine Bereitstellung von Informationen oder aber die Vermarktung der Beiträge – durch *Labelling* (Kennzeichnung) oder *Crediting* (Gutschrift). Programme sollten so entworfen werden, dass der gewählte Ansatz den richtigen Anreiz für eine angemessene Bewertung der Nachhaltigkeitsbeiträge setzt. Ist sich ein Projektentwickler über den möglichen Beitrag zur nachhaltigen Entwicklung bewusst, kann dies begünstigen, dass Projektdesigns dahingehend angepasst werden diesen Beitrag zu maximieren, selbst wenn dieser nicht explizit durch Programme kommodifiziert wird. Dies setzt jedoch voraus, dass Anreize geschaffen werden, dies bereits in der Projektplanungsphase zu berücksichtigen. Abbildung S1 gibt einen Überblick über die Ziele für den Einsatz von Nachhaltigkeitsindikatoren, die wichtigsten Trade-Offs sowie die spezifischen Zwecke der unterschiedlichen Programme.

Abbildung S1: Überblick über die Ziele für die Bewertung von Nachhaltigkeitsbeiträgen



Quelle: Eigene Darstellung.

Welche Ansätze zur Bewertung von Beiträgen zur nachhaltigen Entwicklung sind am effektivsten, und für welchen Zweck?

Kapitel 3 gibt einen analytischen Überblick über die verschiedenen Ansätze zur Bewertung von Beiträgen zur nachhaltigen Entwicklung in bestehenden Programmen, um den jeweils bestgeeignetsten Ansatz für den jeweiligen Zweck zu bestimmen. Dies umfasst die Analyse von Bewertungsansätze für Beiträge zur nachhaltigen Entwicklung (Abschnitt 3.2.1), von MRV-Verfahren für Indikatoren (Abschnitt 3.2.2) sowie von Konsequenzen für das Missachten von geltenden Regeln und Anforderungen (Abschnitt 3.2.3).

Die Maß an Komplexität, Genauigkeit und Granularität der Bewertung sollte so gering wie möglich sein, aber gleichzeitig die für den jeweiligen Zweck erforderliche Detailliertheit und Genauigkeit liefern. Wir stellen fest, dass die Anforderungen an die Bewertung von Beiträgen zur nachhaltigen Entwicklung nicht verallgemeinert werden können, sondern vom jeweiligen Grundgedanken hinter der Bewertung abhängen. Im Gegensatz zum Monitoring von Emissionsminderungen, bei dem ein einziger Indikator objektiv definiert werden kann, ist „nachhaltige Entwicklung“ ein Überbegriff für eine theoretisch unendliche Anzahl von Indikatoren, von denen nicht alle auf dieselbe Weise objektiv definiert werden können. Die Entwicklung eines vollkommen objektiven und umfassenden Verfahrens für die Bewertung von Nachhaltigkeitsbeiträgen kann und sollte daher nicht das Ziel sein. Einige Zwecke erfordern ein höheres Maß an Stringenz, Genauigkeit und Detailliertheit als andere, welches zusätzliche Transaktionskosten rechtfertigen kann. Während eine perfekte Bewertung nicht möglich ist, sollte eine bewusste Entscheidung im Gleichgewicht zwischen Genauigkeit und Pragmatismus für den jeweiligen Bewertungsansatz getroffen werden, wobei die erforderte Stringenz durch den Zweck der Bewertung bestimmt wird.

Für rein informative Zwecke kann ein Ansatz zur einfachen Identifizierung von potenziellen Beiträgen ausreichen, da er ein besseres Verständnis über die Verknüpfungen mit der Entwicklungsagenda bietet, ohne dass erhebliche Transaktionskosten entstehen. Wird jedoch eine Bewertung der Nachhaltigkeitsbeiträge vorgenommen, um diese zu kommodifizieren - entweder durch die Kennzeichnung von Treibhausgasgutschriften oder durch die Schaffung von eigenständen Gutschriften für Nachhaltigkeitsbeiträge - ist es unabdingbar diese mit hinreichender Gewissheit zu belegen. In solchen Fällen ist eine Bewertung der Beiträge zur nachhaltigen Entwicklung gegenüber der Ausgangssituation (baseline) erforderlich, um größtmögliche Klarheit und Gewissheit zu gewährleisten.

Die Ausgestaltung des MRV-Systems hängt davon ab, zu welchem Zweck die Beiträge zur nachhaltigen Entwicklung belegt werden sollen - zur Information, Kennzeichnung oder Gutschrift. Zu Informationszwecken kann eine Selbstberichterstattung und Selbstbewertung, abhängig von der Qualität und Vergleichbarkeit der bereitgestellten Informationen, ausreichend sein. In anderen Fällen ist ein strukturierteres MRV-Verfahren mit Prüfung durch Zweite oder Dritte erforderlich (und im Zertifikatpreis inbegriffen). Programme sollten so entworfen werden, dass der gewählte Ansatz den entsprechenden Anreiz für eine angemessene Bewertung von Beiträgen zur nachhaltigen Entwicklung setzt.

In Abschnitt 3.3 veranschaulichen zwei Fallstudien von VCS mit CCBS und dem Gold Standard, wie die Bewertung von Nachhaltigkeitsbeiträgen mithilfe von Indikatoren umgesetzt werden kann. In beiden Fallstudien wird deutlich, dass der strukturierte Einsatz von Nachhaltigkeitsindikatoren zu einem besseren Verständnis über die Synergien mit der Entwicklungsagenda beiträgt. Beide Studien verdeutlichen jedoch auch, dass die Bewertung von Beiträgen zur nachhaltigen Entwicklung mit zusätzlichen Transaktionskosten verbunden ist.

Welches sind die wirksamsten Kriterien zur Bewertung von Beiträgen zur nachhaltigen Entwicklung durch Indikatoren?

Kapitel 4 gibt einen Überblick, welche Nachhaltigkeitsindikatoren zurzeit auf Projektebene Anwendung finden. Auch die offiziellen SDG-Indikatoren werden dabei berücksichtigt. Die Wirksamkeit dieser Indikatoren wird untersucht. Basierend auf dieser Analyse identifizieren wir Kriterien für die Wirksamkeit von Indikatoren. Zunächst stellen wir auf Basis von bestehenden Programmen eine Liste von 217 Indikatoren auf Projektebene zusammen. Diese analysieren wir anschließend, um Faktoren auszumachen, die die effektive Anwendung von Indikatoren zur Bewertung von Beiträgen zur nachhaltigen Entwicklung untergraben können.

Wir haben die folgenden möglichen Probleme ausgemacht:

1. **Indikatoren können vage sein und sich nicht auf bestimmte Nachhaltigkeitsbeiträge beziehen.** Dies erschwert es, den genauen Ursache-Wirkungs-Zusammenhang zu verstehen oder diesen mit einem gewissen Grad an Genauigkeit zu bewerten.

2. Selbst wenn auf ein bestimmtes Ergebnis oder einen bestimmten Nutzen Bezug genommen wird, gibt es bei einigen Indikatoren **keinen offensichtlichen direkten Zusammenhang mit der Projektebene.** Dies kann ebenfalls erschweren, den Ursache-Wirkung-Zusammenhang zu bestimmen.

3. **Einige Indikatoren lassen sich nicht quantifizieren**. Dies kann die präzise und transparente Bewertung von Beiträgen zur nachhaltigen Entwicklung einschränken.

4. **Einige Indikatoren sind sehr komplex und erfordern entweder erhebliche Datenmengen von Dritten oder Berechnungsmodelle, die Inputhypothesen verwenden**. Dies könnte zu einem erhöhten Aufwand für das Monitoring von Indikatoren führen.

5. **Indikatoren können Themen beinhalten, die politisch sensibel sind**. Dies kann die tatsächliche Anwendung dieser Indikatoren in der Praxis erschweren.

Diese fünf Punkte werden im Hinblick auf die Ziele der Bewertung von Beiträgen zur nachhaltigen Entwicklung genauer beleuchtet, um Kriterien für die Wirksamkeit von Indikatoren festzulegen. Eine Übersicht über die festgelegten Kriterien sowie deren Relevanz für die verschiedenen Programmzwecke findet sich in Tabelle S1.

Tabelle S2: Relevanz der Kriterien für verschiedene Programmzwecke

<table>
<tr><th></th><th rowspan="2">Bewertung zu Informationszwecken</th><th colspan="2">Bewertung zu Vermarktungszwecken</th></tr>
<tr><th>Labelling</th><th>Crediting</th></tr>
<tr><td colspan="4">Kriterien zur Erreichung allgemeiner Ziele für die Bewertung von Nachhaltigkeitsbeiträgen mit Indikatoren</td></tr>
<tr><td>Kriterium 1: Der Indikator bezieht sich auf eine bestimmte individuelle Auswirkung.</td><td colspan="3">Die Erfüllung des Kriteriums ist für den Zweck von wesentlicher Bedeutung.</td></tr>
<tr><td>Kriterium 2: Der Indikator stellt eine direkte und inhärent klare Ursache-Wirkungs-Beziehung zwischen der Aktivität und der Auswirkung her.</td><td>Die Erfüllung des Kriteriums ist vorteilhaft und meistens wichtig für den Zweck.</td><td>Die Erfüllung des Kriteriums ist vorteilhaft und meistens wichtig für den Zweck.</td><td>Die Erfüllung des Kriteriums ist für den Zweck von wesentlicher Bedeutung.</td></tr>
</table>

	Bewertung zu Informationszwecken	Bewertung zu Vermarktungszwecken	
		Labelling	**Crediting**
Kriterium 3: Der Indikator ist quantitativ messbar.	Die Erfüllung des Kriteriums ist **vorteilhaft, aber nicht immer priorisiert.**	Die Erfüllung des Kriteriums ist **vorteilhaft und meistens wichtig** für den Zweck.	Die Erfüllung des Kriteriums ist für den Zweck von **wesentlicher Bedeutung**.
Kriterium 4: Der Indikator kann ohne Berechnungen ermittelt werden, die Inputhypothesen erfordern.	Die Erfüllung des Kriteriums ist **vorteilhaft, aber nicht immer priorisiert.**	Die Erfüllung des Kriteriums ist **vorteilhaft und wichtig** für den Zweck.	Die Erfüllung des Kriteriums ist **vorteilhaft und meistens wichtig** für den Zweck.
Allgemeine Trade-Offs			
Kriterium 5: Die Komplexität von MRV ist überschaubar. **Kriterium 6:** Der Indikator kann mit eigenen Informationen und Daten überwacht werden.	Die Erfüllung des Kriteriums ist abhängig vom jeweiligen Projekt, führt aber zu geringeren Kosten.		
Kriterium 7: Der Indikator sollte sich auf spezifische Ziele der SDGs beziehen.	Die Erfüllung des Kriteriums ist erforderlich, um das Risiko politischer Sensibilität zu verringern.		
Kriterium 8: Der Indikator bezieht sich direkt auf nationale Rechtsvorschriften oder internationale Verträge.	Die Erfüllung des Kriteriums ist von Vorteil, um das Risiko politischer Sensibilität zu verringern.		

Quelle: Eigene Darstellung.

Beim Bewerten der offiziellen SDG-Indikatoren anhand der zuvor festgelegten Kriterien stellen wir fest, dass **die SDGs selbst als Rahmen für die Bewertung von Nachhaltigkeitsbeiträgen von hoher Relevanz sind, jedoch sind die Indikatoren nur zum kleinen Teil auf der Projektebene anwendbar.** Mit Blick auf die Breite der Synergien zwischen Minderungsmaßnahmen und dem Erreichen der SDGs sowie die allgemeine Akzeptanz der SDGs als Marker für nachhaltige Entwicklung, ist es angemessen die Auswirkungen auf die SDGs bei der Festlegung von Nachhaltigkeitsindikatoren auf Projektebene zu berücksichtigen. Einige wenige SDG-Indikatoren sind direkt auf Projektebene anwendbar (~ 4%). Die meisten sind jedoch allein auf der Makroebene relevant und entweder überhaupt nicht auf der Projektebene anwendbar, oder können nur durch Proxy-Indikatoren verwendet werden (~ 30%).

Von den 217 relevanten Indikatoren auf Projektebene, die aus der Literatur und bestehenden Programmen ermittelt wurden, weisen die meisten eine Reihe von Schwächen auf. Diese verhindern, dass die Indikatoren effektiv zum Erreichen aller festgelegten Ziele für die Bewertung von Beiträgen zur nachhaltigen Entwicklung beitragen. Nur wenige der Indikatoren erfüllen alle der zuvor festgelegten Kriterien. In einigen Fällen kann dies beabsichtigt sein, da nicht alle Ziele für alle Programme und Zwecke relevant sind. Darüber hinaus kann die Entwicklung von Indikatoren und Ansätzen zur Erreichung aller Ziele zu höheren Ressourcenausgaben und Transaktionskosten für MRV-Verfahren führen.

Wie sehen verbesserte Ansätze zur Anwendung von Nachhaltigkeitsindikatoren aus?

Kapitel 5 setzt sich mit einer anschaulichen Auswahl von Indikatoren im Detail auseinander. Dabei entwickeln wir Empfehlungen für die Optimierung dieser Indikatoren sowie der MRV-Verfahren, um aus diesen spezifischen Empfehlungen allgemeine Lehren für die Anwendung von Nachhaltigkeitsindikatoren abzuleiten.

Pragmatische Ansätze können die Qualität der Bewertung von Beiträgen zur nachhaltigen Entwicklung verbessern, ohne dabei notwendigerweise die Komplexität des Bewertungsansatzes zu erhöhen. Unsere Analyse zeigt, dass es unabhängig vom Zweck und von der erforderlichen Genauigkeit der Bewertung, einige allgemeine Kriterien gibt, die die Wirksamkeit von Indikatoren verbessern:

- **Die Definition eines Indikators sollte so spezifisch sein, dass es keine unterschiedlichen Auslegungen des Indikators geben kann.** In Bezug auf Monitoring und Verifizierung bietet eine spezifische Definition mehr Klarheit über die verfügbaren Mess- und Verifizierungsansätze. In Bezug auf Berichterstattung und Kommunikation gewährleisten spezifische Definitionen die Vergleichbarkeit und vermeiden Fehlinterpretationen. Spezifische Indikatordefinitionen beeinträchtigen die Flexibilität eines Projektentwicklers jedoch nicht, da die verfügbaren Monitoringansätze flexibel bleiben können und Projektentwickler somit immer den Indikator wählen können, der im jeweiligen Kontext am besten geeignet ist.

- **Wenn möglich, sollten eindimensionale Indikatoren verwendet werden, um die Vergleichbarkeit von Ergebnissen zu gewährleisten und Kosten zu senken.** Man kann zwischen Indikatoren unterscheiden, die eine „einfache“ Messung eines bestimmten Ergebnisses (eindimensional) (z. B. *Anzahl der im Rahmen des Projekts beschäftigten Frauen*) darstellen, und Indikatoren die „komplexer“ sind. Komplexe Indikatoren kombinieren mehrere Messungen innerhalb eines Indikators (mehrdimensional) und enthalten häufig sowohl eine Bewertung der Quantität als auch der Qualität der Ergebnisse (z. B. *Gesamtzahl der Personen, für die sich der Zugang zu oder die Qualität von Bildung verbessert;* wobei der Grad der Verbesserung eine zweite Messung neben der Anzahl der Personen ist). Mehrdimensionale Indikatoren liefern unvollständige Daten, die Informationen vorenthalten, Ursache-Wirkungs-Zusammenhänge verschleiern und zu Fehlinterpretationen führen können. Wenn Beiträger zur nachhaltigen Entwicklung gutgeschrieben werden sollen, ist die Vergleichbarkeit der Informationen jedoch von wesentlicher Bedeutung, sodass mehrdimensionale Indikatoren nicht wirklich geeignet sind. Darüber hinaus kann der Einsatz von mehrdimensionalen Indikatoren zusätzliche Prozesse für Monitoring und Berichterstattung erforderlich machen, die einen erweiterten geografischen Umfang oder ein höheres Maß an Genauigkeit verlangen, um aussagekräftig zu sein. Mehrdimensionale Indikatoren können jedoch einen tieferen Kontext bieten und so die politische Relevanz erhöhen. Die Bereitstellung dieses Kontextes erfordert jedoch zusätzliche Definitionen innerhalb des Indikators, die politisch sensibel sein können.

- **Indikatoren sollten in absoluten Zahlen ausgedrückt werden**. Auf der Projektebene sind absolute Zahlen erforderlich, um Beiträge zur nachhaltigen Entwicklung anzugeben. Die Berichterstattung von proportionalen Indikatoren ist nur dann auf Projektebene möglich, wenn aggregierte Zahlen für die Region oder das Land verfügbar sind. Dies erschwert das

MRV-Verfahren für Projektentwickler. Des Weiteren erhöhen absolute Zahlen die Vergleichbarkeit von Ergebnissen und erleichtern den Verifizierungsprozess.

Mithilfe der beschriebenen Schritte können Indikatoren zielführender eingesetzt werden. Die Schwierigkeiten, die die Bewertung von Beiträgen zur nachhaltigen Entwicklung mit sich bringen, können dadurch allerdings nicht vollständig gelöst werden. Das Streben nach einem hohen Maß an Robustheit wird mit hoher Wahrscheinlichkeit immer zu deutlich erhöhter Komplexität und erhöhten Kosten führen. Obwohl es keine perfekte Lösung für die vollständige Beseitigung dieser Schwierigkeiten gibt, haben wir mithilfe der Analyse bestehender Programme die folgenden Erfolgsfaktoren ermittelt:

- **Strukturierte Ansätze für Monitoring und Verifizierung können ein gewisses Maß an Flexibilität beinhalten**, dass eine Anpassung an verschiedene Kontexte und die jeweils vorhandenen Kapazitäten ermöglicht.
- **Um die Komplexität und die Transaktionskosten zu verringern, könnten nationale und internationale Standardwerte zur Messung der Indikatoren Verwendung finden,** wenn keine tatsächlich gemessenen Werte verfügbar sind (oder nur mit einem vergleichsweise unangemessen hohen Aufwand). Dies könnte gegebenenfalls über einen mehrstufigen Ansatz *(tiered approach)* erfolgen.
- **Zuverlässige und zugängliche Datenquellen sind entscheidend** für die erfolgreiche Anwendung von Indikatoren. Die Datenquellen und die Begründung für die Verwendung dieser sollte dokumentiert werden. Die Zusammenarbeit mit internationalen Gutachterorganisationen kann dazu beitragen, Schwierigkeiten mit unzuverlässigen oder fehlenden Daten zu umgehen.
- **MRV-Systeme müssen sowohl auf institutioneller als auch auf organisatorischer Ebene ein Management-Framework enthalten, das jedem Akteur klare Verantwortlichkeiten zuweist**. Dies verringert das Risiko einer nicht-erfolgreichen Implementierung.

Welches sind die effektivsten Ansätze zur Absicherung vor negativen Auswirkungen?

Kapitel 6 befasst sich mit Schutzmaßnahmen *(Safeguards)*, die von Programmen eingeführt wurden, damit Projekte „keinen Schaden anrichten“. Das Kapitel gibt einen Überblick über häufig verwendete Schutzmaßnahmen und gängigen Praktiken zur Umsetzung dieser.

Während der Ansatz zur Bewertung von positiven Beiträgen zur nachhaltigen Entwicklung vom jeweiligen Zweck der Bewertung abhängt, ergibt unsere Analyse, dass strenge Schutzmaßnahmen gegen mögliche negative Auswirkungen unabhängig davon immer notwendig sind. Alle analysierten Programme erkennen an, dass der Schutz vor negativen Auswirkungen äußerst wichtig ist und haben Verfahren eingerichtet, um Negativauswirkungen entgegenwirken zu können.

Indikatoren können eine wichtige Rolle beim Schutz vor negativen Auswirkungen spielen. Vordefinierte Indikatoren allein sind jedoch nicht ausreichend, da negative Auswirkungen nicht nur eine Reihe vordefinierter Bedingungen betreffen. Vielmehr sind Ansätze erforderlich, mit denen einer beliebigen Anzahl potenzieller negativer sowie unerwarteter Auswirkungen entgegengesteuert werden kann. Insbesondere stellen wir fest, dass die Konsultation von Interessengruppen sowie die Einrichtung von Beschwerdemechanismen unerlässlich sind. Beide Maßnahmen tragen dazu bei

unvorhergesehenen negativen Auswirkungen rechtzeitig zu identifizieren und diesen so entgegensteuern zu können.

Im Vergleich mit der Entwicklung von Indikatoren zur Bewertung positiver Auswirkungen, ist eine starre Definition von Indikatoren zum Schutz vor negativen Auswirkungen weniger erforderlich. Die Analyse bestehender Ansätze zeigt jedoch, dass die Einführung von Modalitäten und Prozesse zur Identifizierung, Vermeidung und Minderung negativer Auswirkungen unabdingbarer Bestandteil eines jeden Programms sein sollte, unabhängig von den jeweiligen Anforderungen an die Bewertung von positiven Auswirkungen auf nachhaltige Entwicklung.

Weitere Forschung zur Unterstützung der internationalen Verhandlungen

Unsere Analyse zeigt, dass es viele verschiedene Zwecke hinter der Bewertung von Beiträgen zur nachhaltigen Entwicklung gibt - zu Informationszwecken allein oder zur Vermarktung durch *Labelling* und *Crediting*. Die Vor- und Nachteile dieser verschiedenen Zwecke lagen jedoch außerhalb des Untersuchungsrahmens. Da es aber ein zentrales Ergebnis dieser Studie ist, dass es nicht *den* optimalen Ansatz für die Bewertung von Nachhaltigkeitsbeiträgen gibt, sondern dass der Ansatz durch den Zweck definiert werden sollte, wird dies zu einer relevanten Frage, die in weiteren Forschungsvorhaben aufgegriffen werden sollte. Führen beispielsweise die unterschiedlichen Zwecke der Bewertung zu einem verstärkten Bewusstsein über die Bedeutung von Beiträgen zur nachhaltigen Entwicklung und zur Optimierung dieser Ergebnisse? Unterscheidet sich der Grad dieses Nutzen? Ansätze mit höheren Transaktionskosten lassen möglicherweise weniger Investitionen in weitere Maßnahmen zu. Es sollte daher geprüft werden, ob die durch *Labelling*- und *Crediting*-Programme geschaffenen Anreize zu ressourceneffizienteren Ausgaben führen, die die höheren Kosten für die Bewertung von Nachhaltigkeitsbeiträgen innerhalb solcher Programme ausgleichen.

Unsere Analyse von Schutzmaßnahmen gegen mögliche negative Auswirkungen *(Safeguards)* konzentriert sich in erster Linie auf die potenzielle Rolle von Indikatoren in diesem Kontext. Wir stellen jedoch fest, dass die Verwendung von Indikatoren allein nicht ausreicht, um alle potenziellen negativen Auswirkungen zu identifizieren, zu vermeiden und zu minimieren. Vielmehr müssen Modalitäten und Prozesse - beispielsweise Beschwerdemechanismen auf Projektebene - eingerichtet werden. In einem nächsten Schritt wäre es hilfreich, Mindestanforderungen an diese Prozesse zu bestimmen und zu evaluieren, ob es für verschiedene Mechanismen machbar sowie attraktiv wäre diesbezüglich einheitliche Standards festzulegen.

Die laufenden Diskussionen zu Artikel 6 des Übereinkommens von Paris bieten die Gelegenheit, aus den Erfahrungen bestehender und ausgelaufener Programme für Marktmechanismen zu lernen. Auch wenn der endgültige Text in Artikel 6 des Pariser Regelwerks möglicherweise keine genauen Bestimmungen über die Bewertung von Beiträgen zur nachhaltigen Entwicklung enthalten wird, sollte die Konferenz der Vertragsparteien, die als Tagung der Vertragsparteien des Übereinkommens dient (CMA), ein klares Mandat für die Festlegung weiterer Einzelheiten geben. Dies kann beispielsweise im Rahmen eines Arbeitsplans in den Diskussionen der Nebenorgane umgesetzt werden. In einer weiteren Veröffentlichung – *Indikatoren für nachhaltige Entwicklung unter Artikel 6 des Pariser Abkommens* – untersuchen wir den aktuellen Stand dieser Verhandlungen unter Berücksichtigung ihres historischen Kontextes. Wir zeichnen unterschiedliche Szenarien für den Ausgang der Verhandlungen auf, und geben Empfehlungen für nächste Schritte, einschließlich eines Entwurfs eines Arbeitsplans für die Diskussion in den Nebenorganen.

1 Introduction

The key objectives of this report are to advance and disperse knowledge on the options for the effective implementation of sustainable development impact indicators, in the context of climate change mitigation mechanisms such as those of Article 6 of the Paris Agreement.

In 2015, all member states of the United Nations agreed on objectives to shift economies and societies toward sustainable and decarbonised development through the adoption of the Agenda 2030 on the Sustainable Development Goals (New York, September 2015) and the Paris Agreement on limiting climate warming to well below 2°C (Paris, December 2015). Both agendas, although negotiated under different multilateral processes, are highly interlinked: The Agenda 2030, for instance, sets out 'Climate Action' as one of the 17 officially agreed SDGs (SDG 13). The Paris Agreement refers to sustainable development a total of 12 times including notably in the preamble; in Article 2 regarding the overall objectives; in Article 4 on mitigation; and in Article 6 on international cooperation; as well as elsewhere throughout the document.

Article 6 of the Paris Agreement sets the blueprint for ambition raising mechanisms through cooperative approaches, involving options for the potential transfer of climate change mitigation outcomes between states. Through this Article, Parties have set a strong political mandate for the thorough assessment of sustainable development benefits. Article 6.2 establishes the promotion of sustainable development as one of the key objectives of any international cooperation involving transfer of mitigation outcomes. Under Article 6.4, it is noted that the established mechanism should both "contribute to the mitigation of greenhouse gas emissions and support sustainable development". Article 6 sets the ambition to combine mitigation projects with sustainable development impact. As this internationally agreed concept should set the global multilateral standard, this report will concentrate on Article 6 mechanisms.

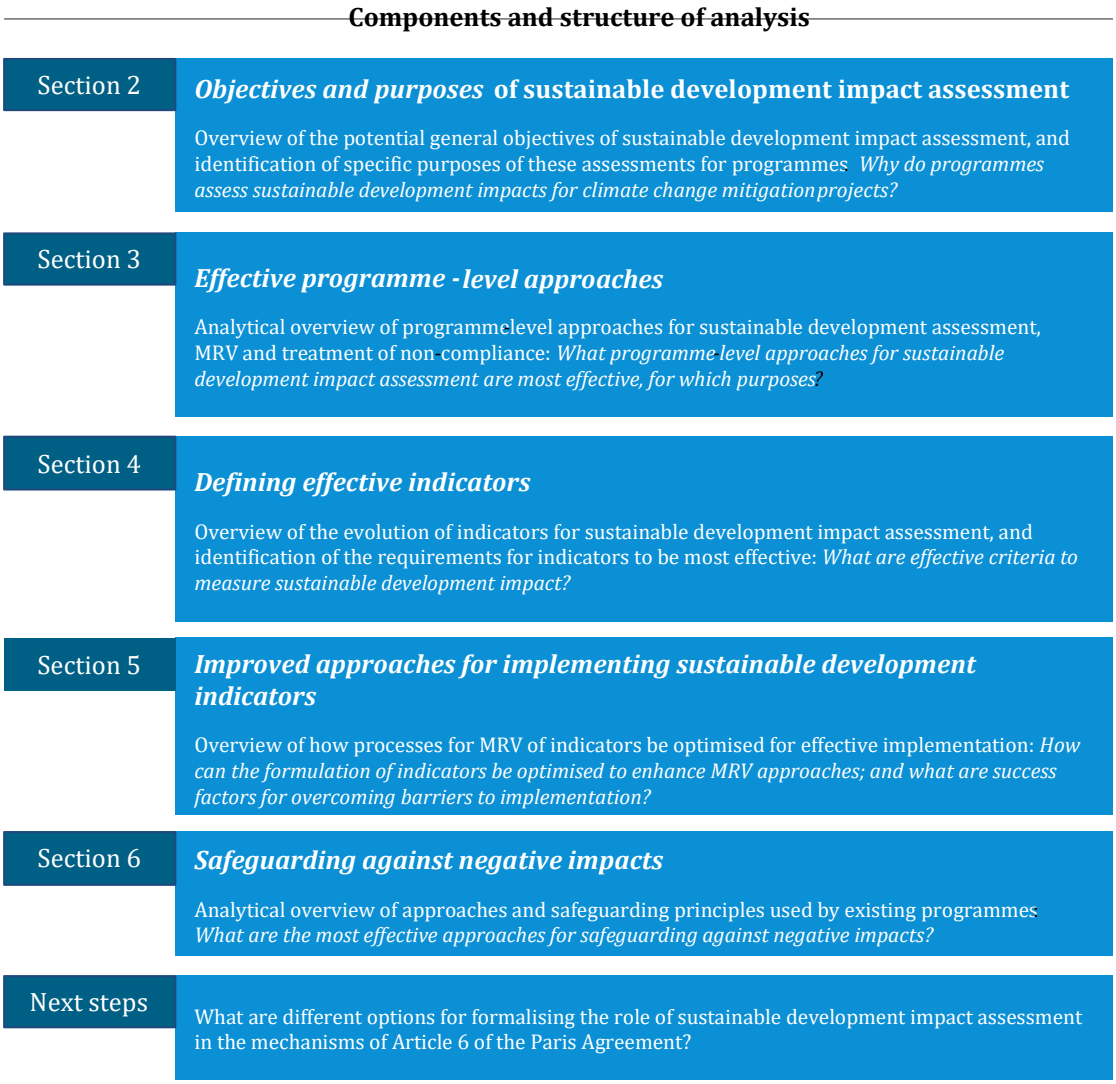
Measuring and tracking the sustainable development impact of climate change mitigation projects raises awareness of impacts and can help project developers understand how to both maximise positive impacts and avoid, minimise, or mitigate potential trade-offs. Furthermore, sustainable development impact assessment is important for climate change mitigation projects in order to increase political buy-in to a project's implementation, to strengthen local acceptance and participation in the project operation, and to increase the attractiveness of the project to potential sources of financial or technical support, among other reasons. Voluntary market actors, in particular, have shown interest to target such projects, and are willing to pay a premium for sustainable development outcomes.

Yet, from previous and existing market-based climate change mitigation mechanisms and project crediting programmes[1], there remains a limited, though increasing body of knowledge on the effective implementation of sustainable development indicators in these contexts.

Figure 1 provides an overview of the key objectives of this research and the structure of the content contained in this report.

[1] Note: The term 'programme' has been used in a broad sense in this report to refer to instruments (e.g. REDD+), protocols/tools (e.g. MAAP protocol) programmes (e.g. Verra) or specific standards under the programmes (e.g. sustainable development VISta) unless specified otherwise. The term "project" is used throughout this report to refer to climate change mitigation projects that may be registered to programmes. Where not stated otherwise, products from the programmes (i.e. labelling or sustainable development impact credits) are additional to credits accrued by the project for greenhouse gas emission reductions.

Figure 1: Overview of key research questions and structure of analysis



Source: Authors' own elaboration

Objectives and purposes of sustainable development impact assessment: Why do programmes assess sustainable development impacts for climate change mitigation projects?

Programmes for climate change mitigation project crediting mechanisms vary with regard to the extent to which they prioritise sustainable development and their reasoning for assessing sustainable development impacts: some programmes seek to assess impacts *for informational purposes* only, while others go further to assess and commodify those impacts for a *labelling* or *crediting* scheme.

The rationale for assessing sustainable development impacts is the key consideration in evaluating what approaches and indicators are most effective.

Section 2 provides an overview of the different general potential objectives and programme-specific uses of sustainable development impact assessment. This overview is then used as a basis for answering the subsequent research questions.

Effective programme level approaches: What programme-level approaches for sustainable development impact assessment are most effective, for which purposes?

We define minimum requirements for the assessment of climate change mitigation projects' impact on sustainable development at the offset standard programme level.

Each offsetting standard programme takes a different approach towards the extent to which they require sustainable development impact assessment from registered projects, and how such assessments are to be conducted.

Section 3 of this report provides an analytical overview of how the most prominent programmes approach sustainable development impact assessment and addresses the following question: *"What approaches are best suited to the different purposes of sustainable development impact assessment?".* The ability of approaches to minimise transaction costs and political sensitivities is also considered within the assessment of effectiveness. This includes analysis of the following:

- Approaches for assessing sustainable development impacts (section 3.2.1)
- Approaches for monitoring, reporting and verification of indicators (section 3.2.2)
- Consequences of non-compliance with rules and requirements (section 3.2.3)

For each of the issues in the list above, we identify a variety of potential approaches from existing programmes and assess their suitability for the different potential objectives and purposes of sustainable development impact assessment. Approaches from the following programmes are considered in the analysis:

- Gold Standard for Global Goals
- Verra's sustainable development VISta standard (SD VISta)
- UN REDD+ Social and Environmental Safeguards/UN REDD+ Cancun safeguards
- World Bank's Mitigation Action Assessment Protocol (MAAP)

Defining effective indicators: What are effective criteria to measure sustainable development impact?

Sustainable development impact indicators have been used by various programmes and for different purposes within the context of climate change mitigation market mechanisms. In section 4, we provide an overview of the status-quo regarding the availability of indicators for sustainable development impact assessment at the project level and assess the effectiveness of these indicators.

Looking at the indicators from existing programmes as a starting point, we consider: "*What are the characteristics of these indicators?*" and *"How suitable are they for the different potential objectives and purposes of sustainable development impact assessment?"* Based on this analysis, we identify criteria to maximise the effectiveness of indicators for fulfilling the different purposes that programmes have for sustainable development impact assessment. As for the approaches in the previous section, the ability of indicators to minimise transaction costs and address political sensitivities is also considered within the assessment of effectiveness.

Improved approaches for implementing sustainable development indicators: How can the formulation of indicators be optimised; and what are success factors for implementation?

Section 5 looks into selected indicators in more detail, developing specific recommendations for the optimisation of those indicators and approaches for the implementation of monitoring, reporting, and verification.

We first assess the differences between the types of indicators analysed to determine whether or not different approaches for the formulation of the indicator and its definition have significant implications for monitoring, reporting and verification. Based on analysis of the selected

exemplary indicators, we then assess remaining barriers to the effective implementation of project-level indicators and potential success factors to overcome those barriers.

Safeguarding against negative impacts: What are the most effective approaches for safeguarding against negative impacts?

While the previous research questions address approaches to assess the impact that climate change mitigation projects can have on selected sustainable development outcomes, Section 6 will look at the safeguards that programmes have put in place to ensure that projects "do no harm". These safeguards are typically practices and principles determined at the programme level.

Although closely related, safeguards and indicators for sustainable development impacts are addressed separately. While the approaches and indicators discussed in the previous research questions usually relate to *selected positive impact indicators*, which would typically be used to demonstrate a project's high quality as it positively contributes towards selected sustainable development outcomes, safeguards against negative impacts require that *principles and practices* are put in place so potential risks across all possible outcomes can be identified and mitigated. The use of monitorable indicators is part of a suite of *practices* that should be used to assess the implementation of safeguarding principles.

Section 6 provides an overview of commonly used themes for safeguarding principles and common practices to enforce them.

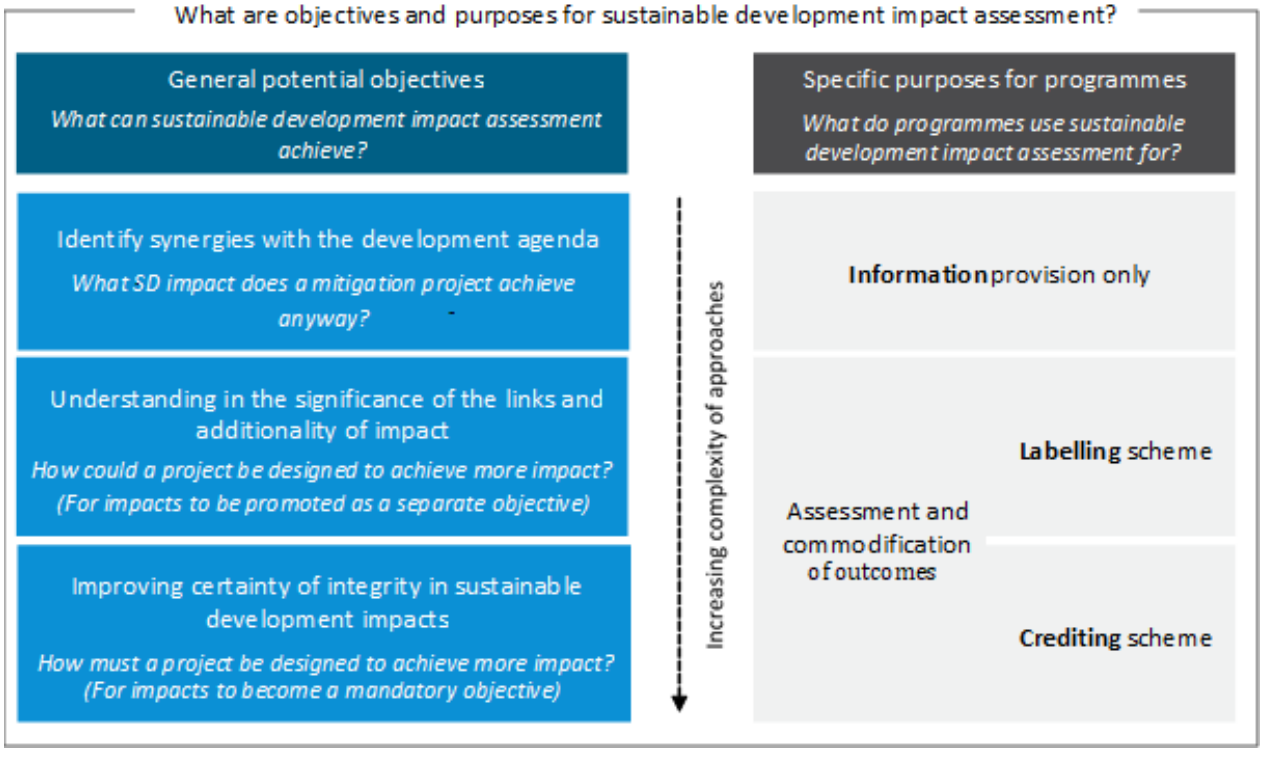
2 Objectives and purposes of sustainable development impact assessment

The overall objective of sustainable development indicators at the project level is to assess the sustainable development impacts of a project. However, compared to the assessment of emission reduction outcomes, which attempts to quantify a single indicator, the assessment of sustainable development impacts is more nuanced: sustainable development involves a myriad of different and sometimes conflicting objectives, and the determination of cause and effect relationships is at least as or more difficult to objectively define. As such, it is a relevant starting point to consider, *what is a realistic objective of the use of sustainable development indicators?* Given that it is not possible to objectively quantify all sustainable development impacts in a single metric, succinctly, *what, specifically, should the use of sustainable development indicators achieve? And what trade-offs may be incurred in trying to achieve these objectives?*

In addition but related to these *high-level objectives* for sustainable development impact assessment, individual project-based programmes have their own *purposes* for sustainable development impact assessment on a practical level, which influences the approaches they take.

This section identifies realistic objectives for the use of sustainable development indicators, the most important trade-offs, and the specific purposes of programmes, as summarised in Figure 2.

Figure 2: Overview of general objectives and specific purposes of sustainable development impact assessment



Source: Authors' own elaboration.

Realistic general objectives for the use of sustainable development indicators

The goals of climate protection and promotion of sustainable development have often been played off against each other in market mechanisms. The first listed purpose of the Clean Development Mechanism (CDM)'s was to "to assist Parties not included in Annex I in achieving sustainable development" (Kyoto Protocol Article 12). To this end, the CDM sustainable development tool was developed to compensate for the general lack of focus placed on sustainable development by the mechanism in practice. The tool, however, created neither a clear financial incentive nor a concrete political mandate for project promoters, investors or host countries to develop projects that were particularly conducive to sustainable development. A globally agreed framework of the likes of the Sustainable Development Goals (SDGs) was also missing in 2001 when the rules, modalities and procedures for the CDM were adopted in the Marrakech Accords.

With the universal adoption of the SDGs in 2015, countries agreed to consider climate change action amongst the range of sustainable development targets, establishing a common ground on the link between climate action and sustainable development. In recent years, the research frontier on exploring the synergies between climate and sustainability impacts has gained new momentum. Steps have been taken to operationalize SDGs through indicators on the national and to introduce the same method on activity level. Meanwhile, the economic value of sustainable development outcomes has increased through the voluntary standards approaches, including the Gold Standard and Verra specifically, in the generation of "sustainability assets". In addition, a perception change is underway through a range of activities with regard to how different stakeholders can support the SDGs, including the private sector (e.g. UN Compact and GRI's *SDG reporting for corporates* or pwc's *SDG selector*). These developments make the identification and implementation of standardised indicators more realistic and practicable.

Considering these developments, there are various potential objectives that different stakeholders could have to use sustainable development indicators. Sustainable development impact assessment could be desirable for one or more of the following purposes, in the context of future carbon markets:

- **Improving the *identification of synergies*** between mitigation project activities and potential sustainable development outcomes. Sustainable development indicators could be used to provide information that allows a better understanding of how a climate change mitigation activity further links to different aspects of the development agenda. Indicators can help broader stakeholders both to identify and appreciate the scale of synergies. Using indicators in accordance with that objective allows for sustainable development impacts to be understood as co-benefits of mitigation projects.

- **Enhancing the *understanding of the significance of the link* between the activity and sustainable development outcomes, and their additionality.** Depending on the type of approaches adopted and indicators used, sustainable development indicators can increase understanding on the directness of the cause and effect relationships between project level activities and the resulting sustainability impacts/outcomes in a transparent manner. This can help to clarify the extent to which observed sustainable development related outcomes can be attributed to the project activity and would not have occurred in absence of the project activity (also referred to as "signal to noise"), an issue described as "additionality" in the context of GHG emission outcomes in climate change mitigation mechanisms. This can help to identify how projects might be better designed to result in enhanced sustainable development impacts, which can be promoted as a separate objective in their own right,

aside from the climate change mitigation outcomes. Additionality may be difficult to objectively prove for socioeconomic outcomes but is particularly relevant in cases where quantified sustainable development outcomes are monetized in a similar manner as emission reductions to attract a price premium. In order to justify the price premium, it is important to directly link the intervention to the impact and have a reasonable assurance that it would not have happened anyhow.

- **Improving the *certainty in the integrity* of sustainable development outcomes.** An enhanced certainty of the impacts depends on the following:
  - **Ability to determine a quantitative outcome:** The ability to quantify an outcome enables an enhanced understanding of the magnitude of the impact.
  - **Confidence in the accuracy of the measurement:** Depending on the approach for the quantification of an outcome, methodological error margins may affect the confidence of measurement accuracy.

Measuring the impact of mitigation projects on sustainable development allows to simultaneously promote and push forward climate change and sustainable development issues on the political agenda.

Trade-offs associated with the use of sustainable development indicators

Accurately and transparently determining sustainable development outcomes of project activities and verifying those outcomes, will result in **transaction costs**. We aim to identify approaches which can optimise the costs borne by project developers during project design and project operations.

Another challenge for sustainable development impact assessment is to transcend potential **political sensitivities**, which may be particularly relevant for standardised indicators at a programme-level. Identifying pragmatic ways to outline actionable and monitorable indicators which can somewhat avoid political reservations is a challenge. A central element in our review of programmes will be to identify synergies between sustainable development impact indicators and the SDG goals, targets, and indicators because the SDGs are codified through an universal agreement.

Significance of objectives and trade-offs in the context of specific programme purposes

The extent to which the identified potential objectives and trade-offs are important depends on the specific context and the envisaged use of the sustainable development impact assessment. Here, three categorisations for programmes' purposes for sustainable development impact assessment are identified:

1. **Assessment for informational purposes only:** The traditional output of impact assessment is purely for informational purposes. This is the case, for instance, under the CDM. Table 1 shows that such an assessment is the least demanding in terms of the different objectives for sustainable development impact assessment. For assessments for informational purposes, only the identification of synergies with the development agenda is essential. Providing more information to improve the certainty of integrity in the impact would be beneficial but is not necessarily required. This approach requires limited resources, and offers the flexibility to avoid political sensitivity, but provides the least amount of information and certainty, and therefore added value.

2. **Assessment for commodification of outcomes**: Some programmes use sustainable development impact assessment in order to create a marketable value-added feature for the project. This can take two different forms:
   a. **Assessment for a labelling scheme:** Both Verra and Gold Standard use sustainable development impact assessments to award a recognised *label* to emission reduction projects that are deemed to deliver significant sustainable development benefits. Such labels enhance the value of emission reduction credits generated by those projects for offset buyers interested in projects with high sustainable development impacts. Table 1 shows that some aspects related to improving the certainty of the impact, such as understanding the significance and additionality of the link, and determining a quantitative indicator, are likely to be important but not necessarily essential to conducting an assessment for a labelling scheme.
   b. **Assessment for a crediting scheme:** Another potential output from the assessment of sustainable development impacts is the **commodification and crediting of sustainable development impacts** for climate change mitigation projects. Both Gold Standard and Verra are working on defining specific methodologies to commodify sustainable development impacts, which can be credited in a similar manner as an emission reduction credit. Most emerging examples of this are standalone credits that can be sold separately from credits associated with the GHG emission reduction outcome. For instance, Gold Standard issues 'water benefits certificates' for Water Access Sanitation and Hygiene (WASH) projects, waste water treatment projects and agricultural interventions (Gold Standard, 2019d). A Water Benefit Certificate (WBC) represents a volume of water that has been sustainably supplied, purified or conserved. Table 1 shows that the operation of a robust crediting scheme would require that all of the potential objectives for sustainable development impact assessment are fulfilled, including determining the significance and additionality of the link, determining a quantitative outcome, and determining confidence in the accuracy of the measurement. This, in turn, leads to high transaction costs and most likely affects political sensitivities. The same scrutiny in assessing sustainable development impact would be needed, if a certain level of sustainable development impact were to be considered as a precondition for the issuance of any emission reduction certificate in the future.

Table 1: Overview of links between general objectives and specific purposes for sustainable development impact assessment

The table shows how the general high-level objectives relate to the specific purposes of individual programmes. The extent to which the general objectives are beneficial, important or essential for the programme purposes is assessed. The table does not show which objectives the different purposes can achieve: the fulfilment of the objectives depends on the approaches employed by the programmes, but any purpose does not exclude approaches that could result in the fulfilment of all objectives.

	Assessment for informational purposes	**Assessment for commodification**	
		Labelling scheme	**Crediting scheme**
General objectives for sustainable development impact assessment			
Identify synergies with the development agenda *What SD-impact does a mitigation project achieve anyway? (For SD-impact to be understood as a co-benefit)*	Fulfilment of the objective is **essential** for the purpose.		

Understanding in the significance of the links and additionality of impact *How could a project be designed to achieve more SD-impact? (For SD-impact to be promoted as a separate objective besides mitigation)*	Fulfilment of the objective is **beneficial and important** for the purpose.	Fulfilment of the objective is **beneficial and important** for the purpose.	Fulfilment of the objective is **essential** for the purpose.
Improving certainty of integrity in sustainable development impacts *How must a project be designed to achieve more SD-impact?(For SD-impact to become a mandatory objective besides mitigation)*			
Ability to determine a quantitative outcome	Fulfilment of the objective is **beneficial but not always prioritised** for the purpose.	Fulfilment of the objective is **beneficial and usually important** for the purpose.	Fulfilment of the objective is **essential** for the purpose.
Confidence in the accuracy of the measurement	Fulfilment of the objective is **beneficial but not always prioritised** for the purpose.	Fulfilment of the objective is **beneficial but not always prioritised** for the purpose.	Fulfilment of the objective is **essential** for the purpose.

Source: Authors' own elaboration.

The purpose of sustainable development impact assessment can be different for different programmes and it is not yet determined whether there will be a consistent approach developed for the international level under Article 6 of the Paris Agreement, and which objectives such an approach would have. If at some point emission reduction credits could only be issued if sustainable development impacts were clearly demonstrated, this could be addressed accordingly. As such, we do not make a predetermination of the relative importance of different objectives for the analysis in sections 3 and 4. Instead, we assess the extent to which different approaches and indicators can deliver on all of these potential objectives while minimising potential trade-offs.

3 Effective programme-level approaches for sustainable development impact assessment

The objective of this section is to identify, categorise and assess the advantages and disadvantages of different approaches taken by the programmes reviewed in this study to assess sustainable development impacts for specific purposes i.e. information only, labelling, commodification. In Section 3.2.1 to 3.2.3, we identify approaches to the following issues:

- Approaches to assess sustainable development impacts (section 3.2.1)
- Approaches for the monitoring, reporting and verification of indicators (section 3.2.2)
- Consequence of non-compliance with rules and requirements (section 3.2.3)

The assessment is divided into three parts:

- Part 1 categorises the practices followed in the selected programmes into common approaches;
- Part 2 assesses the identified approaches against the key objectives and trade-offs identified in section 2;
- Part 3 presents arguments for why certain approaches are more suitable than others for specific products.

The analysis refers to relevant literature on the issue and our expert understanding of the topic. This discussion will inform the development of optimal approaches in section 5, and to an extent, the selection of effective indicators in section 4.

We begin the section by providing an overview of the programmes we have selected for this study. These brief outlines provide a snapshot of the history and objectives of each programme, and their overarching approach towards determining SDG contributions.

3.1 Overview of programmes assessed

Gold Standard for Global Goals: The Gold Standard was established in 2003 by WWF and a group of non-profit organisations to ensure projects certified under the UN's Clean Development Mechanism (CDM) also contributed towards sustainable development. It started as a label for CDM projects but expanded in 2006 to become an independent certification standard for projects to be used in the voluntary carbon market.

An extension of the standard was introduced in 2017 - the "Gold Standard for the Global Goals" strives to quantify, certify, and maximise project impacts toward climate security and the SDGs. The Gold Standard requires projects to address and show contributions towards at least three SDG targets (Gold Standard, 2017b). The program identifies two types of products:

- *Gold Standard certified labels* are given to projects that fulfil the program's requirements and undergo MRV through an accredited auditor. These labels are applied not only to carbon emission reductions, but can also be applied to Renewable Energy Certificates, through the separate Renewable energy label product requirements (towards SDG 7 'Affordable and Clean Energy').

- *Gold Standard certified sustainable development credits* can be generated by using a Gold Standard Certified methodology. A methodology exists for the generation of water benefits certificates (as contributions towards SDG 6 'Clean Water and Sanitation'). While the methodology was launched in 2014, only three projects have registered and are issuing certificates to date. These projects are not registered to carbon certification schemes, ensuring no overlap or double counting of finance.

Verra's sustainable development VISta standard (SD VISta): Verra has developed some well-established voluntary offsetting standards - the Verified Carbon Standard (VCS) that issues voluntary GHG offset credits and the Climate, Community and Biodiversity standard (CCB) which supplements VCS for land use projects.

Verra launched the Sustainable Development Verified Impact Standard (SD VISta) in January 2019. The standard is currently being tested in 16 pilot projects. The standard sets rules and requirements to explicitly advance SDGs. VISta requires reported impacts to contribute to at least one SDG target (Verra, 2019b). It builds in a lot of flexibility for project initiators to demonstrate sustainable development impact according to the specific project circumstances. The standard can be used for informational claims only or to certify two types of 'products':

- *SD VISta claims:* Project developers can have Verra approved experts (called independent evaluation expert or IEE) assess and validate claims which they make regarding supposed sustainable development impacts. Claims only have informational value. There is no ex-post evaluation.

- *SD VISta labels:* A label is a permanent marker added to a unit/credit that makes it easier to identify projects which have achieved net-positive sustainable development impacts. Successful verification under the SD VISta Programme or a programme that supports SD VISta labelling (e.g., the VCS Program) enables the addition of a SD VISta label to the other programme's units (e.g., VCUs).

- *SD VISta assets:* Similar to the Gold Standard, SD VISta could potentially generate a standardised, quantified sustainable development impact unit using a Verra approved methodology. To generate assets, projects must be verified by a Verra approved auditor. Assets could be transacted similarly to carbon credits. In principle, a project can use SD VISta approved methodologies to generate multiple assets, so both carbon credits and sustainable development benefit assets can be created by the same project activity using two methodologies. This can raise accounting issues related to double counting. The standard's website has no approved methodology for asset generation so far (as of 31 October 2019[2]).

UN REDD+ Social and Environmental Safeguards: REDD+ is a voluntary climate change mitigation framework agreed by UNFCCC Parties after decade-long negotiations. The concept incentivizes developing countries to reduce emissions from deforestation and forest degradation, conserve and enhance forest carbon stocks as well as sustainably manage forests.

REDD+ is a multi-scalar framework i.e. REDD+ activities can be both national or sub-national programmes and projects. REDD+ projects have typically been developed under the voluntary

[2] The current methodology page can be found here: The following link leads to the Internet: https://verra.org/project/sd-vista/methodologies/

carbon markets to generate monetized emission reduction credits (Schneider, Conway, Kachi, & Hermann, 2018).

Parties further adopted a set of safeguarding principles for REDD+ activities under the Cancun Agreement's decisions in 2010 (or "Cancun safeguards"). These safeguards include procedural criteria (e.g. stakeholder participation, consistency with national forest programmes), social and environmental issues (e.g. respecting indigenous people's rights, conservation of natural forests and biodiversity), and institutional requirements (e.g. national forest governance structures). The Cancun safeguards, along with the Warsaw framework on REDD+ are the starting point for initiatives and standards that support countries in operationalizing national frameworks for REDD+ (e.g. the UN-REDD+ programme, the Forest Carbon Partnership facility) as well as for project and programme-level carbon market standards for forestry related activities (e.g. Verra's CCB standard, Gold Standard's Land Use and Forests Framework & Afforestation Requirements) (Schmidt, Gerber, & Baum, 2016; Schneider et al., 2018).

World Bank's Mitigation Action Assessment Protocol: The Mitigation Action Assessment Protocol (MAAP) is a tool for showcasing and benchmarking GHG mitigation activities. The MAAP tool is divided into four modules: 1) Programme Design/Implementation, 2) Management Entity, 3) Financial Structure and 4) Development Benefits. Each module is independent from the others and includes a set of assessment areas and key indicators. The final score is the weighted sum of the modules. The score of the module, in turn, depends on the weights assigned to the assessment areas and indicators.

The developers of the tool deem a standardised categorisation of sustainable development impacts difficult as the types of development impacts can be exhaustive. The module on development impacts therefore focuses on evaluating how relevant stakeholders or institutions identify, plan, implement, and supervise the specific impacts of the activity. The tool underscores that the objectives of the activity should be in line with the SDGs.

Overall, the MAAP tool is a self-declaratory tool that was not developed to demonstrate compliance with a certain standard. For the near future, the MAAP tool is foreseen by its developers to enhance the comparability of mitigation actions in the context of Article 6 of the Paris Agreement. Currently, the World Bank is working with the Designated Operational Entities and Independent Entities Association (D.I.A.) to develop a manual and code of conduct to ensure the integrity and quality of independent assessments using MAAP.[3]

3.2 Comparative analysis of approaches adopted in reviewed programmes

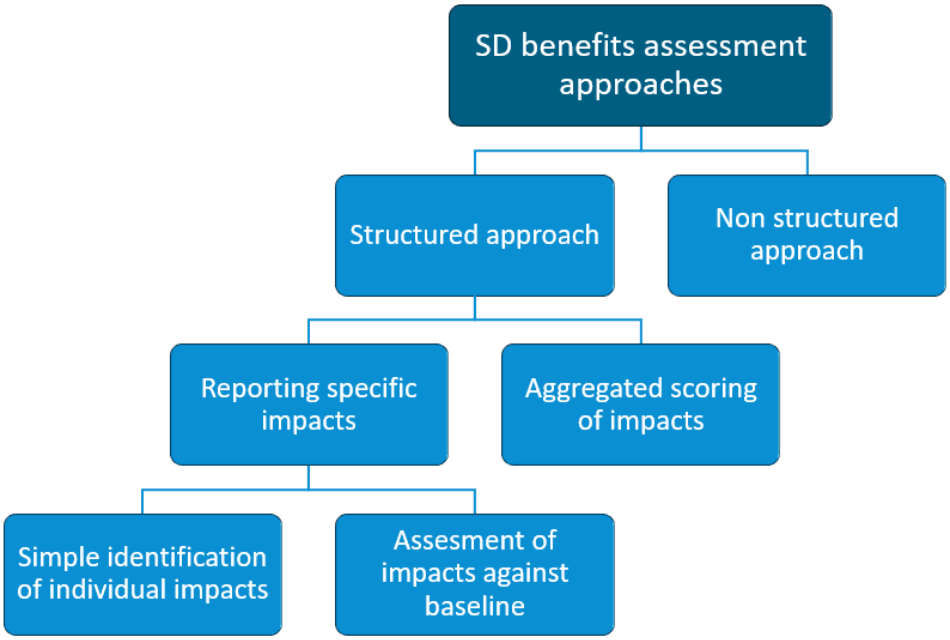
3.2.1 Approaches for the assessment of sustainable development impacts

Common approaches used for the assessment of sustainable development impacts

Based on the review of programmes analysed for this report and previous literature, programmes can be categorised into those that allow a **non-structured approach** to assessing sustainable development impacts, and those that have a pre-defined **structured assessment approach** that projects are required to follow (Figure 3).

[3] Email communication with World Bank dated 10th April 2019.

Figure 3: Approaches for undertaking assessment of sustainable development impacts



Source: Authors' own elaboration.

Programmes that follow a **non-structured approach** only set high-level requirements for claiming sustainable development impacts. These rely mostly on self-reporting of impacts. The treatment of sustainability assessment under the Clean Development Mechanism (CDM) can be considered non-structured as its modalities and procedures only set broad requirements for documentation of environmental impacts[4], without providing further guidelines on how impacts are to be analysed and what minimum quality requirements should be adhered to make concrete claims of positive impacts (UNFCCC, 2006, pp. 23–24). Over the years and after significant critical feedback from stakeholders, the CDM has moved towards defining more structured assessment approaches in the form of voluntary declarations using the CDM Sustainable Development tool.

An alternative impact assessment approach, which is common practice in the voluntary market and newer programmes, is to have a pre-defined, **structured assessment approach** by elaborating clear rules and requirements for various aspects of the assessment. Such an approach could include the identification of impacts, assessing their significance, and transparently documenting and monitoring them for second- or third-party checks. Structured assessments can further be classified into two types, i.e. **assessment through aggregated scoring** of impacts, and **assessment through reporting of specific individual impacts.**

Assessment through aggregated scoring typically includes a list of criteria on impacts and potentially on the quality of procedural requirements such as stakeholder participation, which are then scored based on pre-defined scoring thresholds. The scoring thresholds can be defined both qualitatively (yes/no, with justification) and quantitatively, depending upon the nature of the indicator. Criteria can be prioritised by applying different weights. The scores of individual criteria are aggregated to define an aggregated score. Scoring approaches are typically 'self-evaluation' based; i.e. the project developer assesses their own project, and this assessment may then or may then not be checked by a second party (e.g. the programme administrator) or a third-party (e.g. an external auditor).

[4] For Afforestation and Reforestation projects and Carbon Capture and Storage projects under the CDM, social impacts should also be considered.

The MAAP protocol is an example of a scoring-based assessment. It defines a list of indicators for the quality of procedures for identifying, planning, and implementing specific sustainable development impacts. The programme groups indicators into three assessment areas:

- the ways in which a mitigation activity defines, documents and reports sustainable development impacts ('Sustainable Development Objectives and Targets');
- monitoring approaches employed ('Monitoring of Development Benefits'); and
- procedures followed to make the processes inclusive for stakeholders ('Planning and Participation') (World Bank, 2017b).

Under each module, the user can assign weights to both the indicators and the assessment area. The protocol provides pre-set 'scoring thresholds' based on the quality of benchmarks, but these can be overridden by users (see an example of a scoring benchmark in Box 1). The total score of an activity is a weighted average of scores of all modules. The MAAP tool is a 'self-evaluation' tool and can be used both during project design (ex-ante) and/or during implementation (ex-post). Currently, it is a purely declaratory tool and is aimed at enhancing comparability of mitigation outcomes.[5][6]

Box 1: Example of scoring thresholds used under the MAAP Protocol

Indicator: 'Mitigation action sustainable development objectives and targets'

Scoring thresholds: The user can choose the following pre-defined scoring thresholds:

60-100:
The MA clearly identifies its contribution to the UN Sustainable Development Goals (SDG) and establishes specific targets aligned with the UN SDG Targets.

40-60:
The MA has clearly identified and defined its development benefits, but it has not set specific targets for those that it intends to promote/report upon.

0-40:
The MA does not identify its contribution to sustainable development.

Source: World Bank, 2017b

Assessments through reporting of specific individual impacts: Reporting specific impacts, i.e. not generating aggregated scores, is a common approach applied in the voluntary carbon market standards we reviewed, i.e. SD VISta, Gold Standard for Global Goals and in market-based activities under the REDD+. Because the identification of the impacts is more transparent and tangible than an aggregated scoring approach, the reporting of specific individual impacts can provide much greater clarity to improve understanding of the links between the project activity and the wider development agenda.

Approaches that report specific individual impacts can be further classified into two broad types: programmes could require a **simple identification of specific potential impacts**; or an active **assessment of impacts against a baseline.**

[5] Based on email communication with the World Bank dated 10th April 2019.

[6] Other programmes using a scoring based approach include Thailand's Crown standard, the Social Carbon Methodology, the NAMA Sustainable Development tool and previous versions of the Gold Standard (Arens et al., 2014)

Simple identification of potential impacts may be carried out if a programme only requires project developers to state potential impacts without comparing them to a baseline in order to justify that the impacts are a direct consequence of the activity and would not have happened without the project. Such approaches do not necessarily belong to *non-structured assessment approaches* since they may still assess some requirements.

An example of simple identification approaches is the use of **checklists** for sustainable development impact assessment. The voluntary CDM sustainable development tool approved by the CDM executive board in 2012 uses a checklist approach wherein a taxonomy of generic sustainable development criteria and indicators under the social, economic and environmental pillars of sustainability are provided. Project developers can choose the impacts their projects provide from this checklist and can add additional impacts that might not be in the list. The chosen indicators have to be qualitatively justified and project developers can provide further information on the extent of positive impacts (also defined as per the qualitative rating - N/A, No, Slightly, Partly, Highly).

Active assessment of impacts against a baseline: Baseline based assessments require project developers to assess a project's impact against baseline conditions to determine if the claims made are beyond business as usual. This requires the use of indicators to demonstrate impacts through measurements (e.g. number of jobs created, reduction in emission of local air pollutants) or estimations (e.g. through a survey of affected stakeholders) in this approach. Typically, impact indicators are included in a monitoring plan and checked by a third party.

Among the reviewed programmes, both voluntary standards, i.e. Gold Standard and SD VISta, use a baseline-based approach for sustainable development impact assessments. Sustainable development impacts are identified in comparison to these baseline situations. Both standards require project developers to identify a baseline scenario, understood as the conditions or events that would have existed in the absence of the project activity. SD VISta additionally requires projects to identify a 'baseline situation' i.e. to elaborate the social, economic, and natural capital conditions at the beginning of the project. In both standards, project developers are required to justify that the project has a positive net-benefit. A net-benefit is the difference between the project impact estimate and the baseline estimate.

For instance, Gold Standard has approved a methodology to estimate averted mortality and disability adjusted life years (ADALYs) from cleaner household air as a proxy for contribution to SDG 3 - ensure healthy lives and promote well-being for all at all ages (Gold Standard, 2017d, p. 12)**.** The methodology requires the baseline scenario to include the baseline fuel consumption pattern, $PM_{2.5}$ exposure, and technology use of the population targeted by the project (ibid.).

Overview of programme approaches vis-à-vis sustainable development objectives and trade-offs

Table 2 summarises the implications of the identified high-level sustainable development impact assessment approaches against the objectives and trade-offs for sustainable development impact assessment, as identified in section 2. It shows that the use of different approaches has implications for meeting the potential objectives of sustainable development impact assessment.

The efficacy of non-structured approaches in fulfilling sustainable development objectives is heavily dependent on the quality of the information that project participants self-declare. Without any checks from the programme, their efficacy in improving the understanding of synergies with the development agenda, transparency and certainty of claims made cannot be stated with confidence. Due to limited procedural requirements, these approaches are deemed to be less complex and do not pose the same resource burden on project developers. Further, they have not been particularly politically contentious.

Scoring approaches such as the MAAP protocol can also serve as practical and pragmatic tools for generating indicative impact assessments. However, the accuracy and transparency of claims is limited. Since these approaches usually use qualitative benchmarks for scoring, they have limited ability to give quantitative claims on the extent of the sustainable development impact. Further, the use of weightings can have a significant effect on the overall scores, reducing transparency on the specific impacts behind the aggregated scores. The development of an agreed methodology for aggregated scoring of impacts, including the determination of weights, can also be a politically sensitive issue, since some stakeholders may value certain impacts more than others. This issue is a particularly relevant barrier in the context of determining a common approach for assessing sustainable development impacts in Article 6.4 of the Paris Agreement, where a common approach would have to be agreed by all Parties to the Paris Agreement.

Compared to simple assessment approaches, baseline-based assessments improve the transparency of claims of sustainable development impact by requiring project developers to explain or demonstrate how the impact is indeed a consequence of the activity, a detail which simple impact identification approaches may omit. However, the additional complexities associated with baseline-based approaches – including strict assessments and mandatory documentation – can be a resource intensive burden which may significantly increase project transaction costs.

Table 2: Analytical overview of the different approaches for assessment of sustainable development impacts in the reviewed programmes

	Fulfilment of objectives				**Trade-offs**	
	Identify synergies with the development agenda	*Understanding the significance of links and additionality of impact*	*Improving certainty of integrity in sustainable development impacts*		*Complexity and resource requirements*	*Political sensitivity*
			Ability to determine a quantitative outcome	*Confidence in accuracy of measurement*		
Non-structured approach	Likely low. Depending on quality of information provided.				Low	Low
Aggregated scoring of impacts	Low-Medium	Low	Low	Low/ Medium	Low-Medium	High
Reporting specific individual impacts						
Simple identification of potential impacts	Medium	Low	Low	Low	Low	Low
Assessment of impacts against a baseline	High	High	High	High	High	Low

Source: Authors' own elaboration.

Suitability of the identified approaches for different products

Certain benefit assessment approaches may be more suited than others – depending on the purpose of the assessment, i.e. if the assessment is purely for *informational purposes*, or if the assessment is for the project proponent to use the claim for commodification, either to *label* GHG

credits or projects as high sustainable development impacts or *commodify* the impacts themselves for monetisation. Table 3 summarises the suitability of different sustainable development impact assessment approaches we have identified above, against the potential use of such assessments.

A *non-structured impact assessment*, for instance, does not fulfil most objectives of sustainable development albeit it may be the least complex and least cost intensive approach. Considering the integral role of sustainable development promotion under Article 6, an unstructured approach is not likely to be a sufficient way forward, irrespective of the purpose of the impact assessment.

If sustainable development impact assessments are carried out for purely informational purposes, a *simple identification of potential impacts'* approach may be enough as it can provide an enhanced understanding of the links to the development agenda without incurring significant transaction costs due to related complexity of assessment.

However, if sustainable development benefit assessment is carried out in order to commodify the outcome, either by selling the carbon credit at a premium price (in the case of labeling) or as a standalone sustainable development impacts credit – approaches which improve the certainty of claims are necessary. In such cases, assessment of impacts against a baseline provide increased clarity and certainty.

Table 3: Suitability of different impact assessment approaches as per different purposes

Assessment approaches / Products	Information only	Labelling	Crediting
Sustainable development impact assessment approach			
Non-structured impact assessment	Likely insufficient[7]	Insufficient	Insufficient
Structured impact assessment			
• *Aggregated scoring of impacts*	Potential use, depends on design	Potential use, depends on design	Insufficient
• *Assessment of specific individual impacts*			
- *Simple identification of potential impacts*	Likely sufficient	Potential use, depends on design	Insufficient
- *Assessment of impacts against baseline*	Sufficient	Sufficient	Sufficient

Source: Authors' own elaboration.

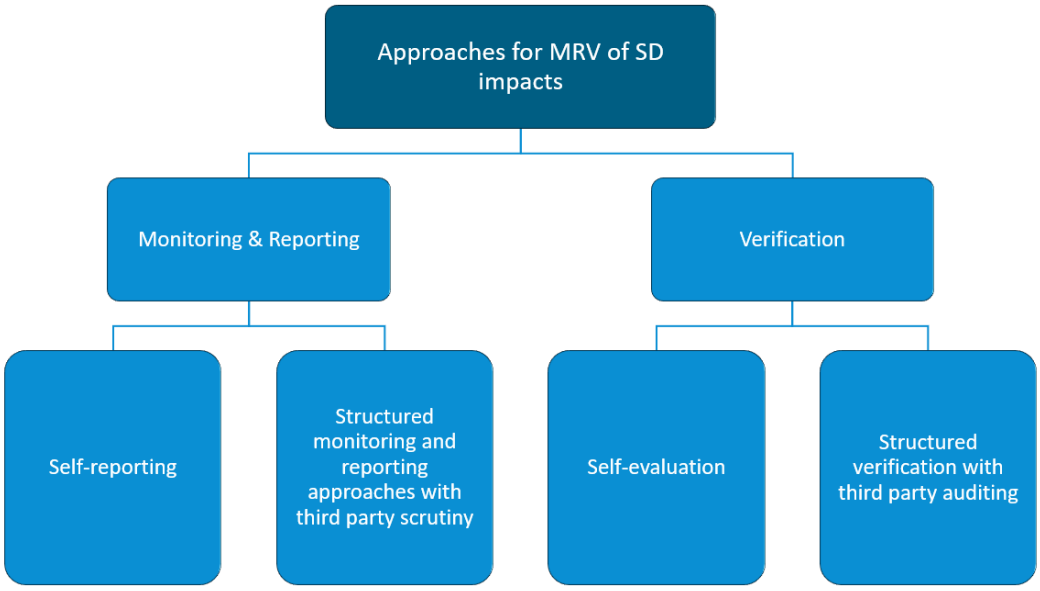
[7] Non-structured impact assessment may be sufficient for the provision of information only if there are no requirements or expectations on the quality or comparability of the information required. The importance given to sustainable development outcomes in the text for Article 6 of the Paris Agreement means that such an approach is unlikely to be sufficient, even in the case that the mechanisms strive to provide *information only*. Further analysis on options for programmes under Article 6 of the Paris Agreement will be included in subsequent reports of this research undertaking.

3.2.2 Approaches for monitoring, reporting and verification of indicators

Common approaches for MRV of selected programmes

The programmes considered in this study follow different approaches to monitoring, reporting and verification (MRV) (Verra, 2019b). From an assessment of the programmes, it appears that an important feature for MRV of sustainable development impacts is a structured and transparent approach, with dedicated monitoring and reporting plans and periodic review cycles. Depending on the intended use of the results, different approaches exist to verify results, ranging from self-evaluations to independent third-party audits (Figure 4). Also, many standards conduct a second party assessment – basically an assessment by the standards themselves, with varying degree of sustainable development impact assessment.[8]

Figure 4: Approaches for monitoring, reporting and verification of indicators



Source: Authors' own elaboration

While VERRA and the Gold Standard prescribe specific approaches to assess sustainable development impacts, REDD+ for instance requires countries to comply with UN safeguards; concerning additional sustainable development impacts (also called non-Carbon Benefits, NCB), those are treated differently by various standards and their approaches towards forestry (such as the Gold Standard itself, the Verified Carbon Standard, or the Climate Community and Biodiversity Standards). As the World Bank´s MAAP tool, similarly to the CDM sustainable development tool, is a self-assessment tool for benchmarking project impacts though scoring, it does not require MRV to verify that (anticipated) results were actually achieved ex-post. The HDI and WHO indexes serve as descriptive indicator sets that do not underlie dedicated assessment procedures for compliance with certain standard provisions.

What is the procedural approach for monitoring and reporting?

Concerning the monitoring and reporting, the previous section leads to the identification of a division into **self-reporting** and more **structured monitoring and reporting approaches with third party scrutiny**. Subsequently, the monitoring and reporting processes of VERRA, the

[8] For instance, the Gold Standard is checking sustainable development impacts of projects during a " completeness check before a third-party auditor is appointed. During this.

Gold Standard and REDD+ are described, all falling under the category of more structured monitoring and reporting approaches with third party scrutiny.

For monitoring, **VERRA** requires that a monitoring plan be part of the project design and include the data and parameters monitored over a pre-defined time period to determine impact of project activities towards sustainable development objectives and SDG contributions stated in the project design. Monitoring reports also provide an update on the costs and risks of negative impacts (see Section 6 for more details on safeguards against negative impacts); and the measures taken to avoid them. The monitoring results are presented in a monitoring report, which should include the following on sustainable development impacts:

- Data on the type and magnitude of the project impacts, costs and risks on impacts identified in the project design
- Changes in stakeholder wellbeing and/or natural capital and ecosystem services (2 impact categories recognised by SDVISta) due to project activities
- Status of activities intended to mitigate negative impacts on stakeholders and/or natural capital and ecosystem services; and grievance and redresses made in the period
- Any SDG target(s) associated with the impact categories which will be used as sustainable development VISta claims or assets.

The **Gold Standard for Global Goals** requires projects to set up a monitoring and reporting process for defining respective impacts in the context of SDGs; a standardised and well-structured 5-step approach for monitoring and reporting is established, using self-proposed indicators coupled with clear rationale, justification and in some cases expert opinion as to how these will positively influence an SDG (Box 2). As described above, impacts in the context of SDGs are hereby demonstrated by comparing to a baseline scenario. Impact indicators can be identified from the UN SDG indicators list, a Gold Standard SDG tool or a Gold Standard approved methodology.

Box 2: Gold Standard's 5-step procedure for defining sustainable development impacts and setting monitoring indicators to be included in the monitoring & reporting Plan

- **Step 1:** Identify the broad list of potential SDG Impacts provided by the Project by comparing the Project Scenario to the Baseline Scenario (note that multiple baseline scenarios may be relevant depending on the SDG Impacts and/or methodologies followed). All SDG Impacts shall be demonstrated as making a positive effect beyond what would reasonably be expected to occur in the Baseline Scenario.
- **Step 2:** Based on the potential SDG Impacts identified in Step 1, select the minimum 3 (including climate security, SDG 13)
- **Step 3:** The Project Developer may choose from the following options to demonstrate SDG Impacts:
    - **Option 1 –** For any SDG Impact the Project Developer shall review the UN SDG Targets and Indicators from the relevant National SDG Indicators, or in their absence, the latest internationally adopted version or the latest version 'under consideration' where Indicators are not yet fully adopted. Select the three most relevant to the chosen SDG Impacts. Propose an

Output Indicator and Justification Information that, combined, demonstrate how the Project positively impacts the chosen Sustainable Development Goal Indicator.

  - **Option 2 –** Follow a Gold Standard Approved SDG Tool for the demonstration of SDG Impact(s).
  - **Option 3 –** Follow a Gold Standard Approved Methodology, published or referenced via the Gold Standard website. These are typically used by Project Developers to achieve issuance of Gold Standard Certified Impact Statements or Products.
- **Step 4 (where required):** For certain SDG Impacts, an Expert Stakeholder Opinion and Recommendation may be required.
- **Step 5:** Include the Output Indicator, Justification and Monitoring Approach or the monitoring parameters for Gold Standard Approved SDG Tools or Methodologies in the Project Design Document Monitoring Plan to inform future Monitoring Reports.

Source: Gold Standard, 2018c

Gold Standard projects that apply for performance certification submit monitoring reports that include information and data on their outcomes over a pre-determined period of time called monitoring period. The monitoring reports include granular information on the outcomes (e.g. number of jobs created by the project, positive health outcomes from the project etc.). This data can then be used to derive the monetary value of the outcome using standardised tools. A certification body (SustainCert) has recently been established to provide such impact assessments of impacts in the context of SDGs from Gold Standard activities (Gold Standard, 2017c, 2017e, 2019c).

Concerning MRV for **REDD+,** the UNFCCC guidance for meeting the Cancun safeguards apply, as well as the potential provisions of individual standards to demonstrate additional sustainable development impacts (or NCBs). With regard to the former, countries implementing REDD+ activities should periodically summarise how the safeguards are being addressed and respected. This summary should be included in national communications. In general, the monitoring and reporting for REDD+ activities is a country driven process.

Indicators for monitoring of sustainable development impacts, safeguards and social and environmental impacts may be incorporated and are ideally to be aligned with the indicators used on the national level to comply with the UNFCCC safeguards provisions. (Brazilian Ministry of Environment (Secretariat of Climate Change and Forests), 2016; REDD Implementation Centre (Nepal), n.d.; Saunders, J, Reeve, 2010).

What is the procedural approach for verification?

With respect to verification, the above programmes´ approaches can be categorised as **self-evaluation** and more **structured verification with third party auditing**. The verification processes of VERRA, the Gold Standard and REDD+ are summarised in the following, all falling under the category of **structured verification with third party auditing**.

Two routes for verification exist under **VERRA**, depending on the foreseen “utilisation” of the sustainable development impact assessment:

- Sustainable development Assets need to be verified by an auditor commissioned by Verra (called VVB)[9].
- Sustainable development claims can be checked by an Independent Evaluation Expert (IEE)[10]. sustainable development VISta´s independent expert evaluation process involves two steps: design evaluation (analogous to validation) and implementation evaluation (analogous to verification).
- Hereby, implementation evaluation is the periodic ex-post assessment by an IEE of the project's sustainable development impacts that have occurred during the monitoring period. With respect to this assessment, both desk-based assessment and compulsory field visits are required.

Reported indicators are verified under **Gold Standard** Validation/Verification Bodies (GS-VVBs) for certification. Here, projects have to be submitted for verification at least once during the 5-year certification period, with verification undertaken by a GS-VBB (appointed by the project developer). The process starts when a project developer has contracted an eligible GS-VVB, submitted the Monitoring Report to the GS-VVB (who uploads it to the Gold Standard Registry), and notified the Gold Standard of the commencement of the verification (via regional contacts). Failure to do so may result in a delay to the commencement of the performance review. The verification ends when GS-VVB provides a written verification report to the Gold Standard. A positive verification report shall have no pending or open clarification action requests by the GS-VVB (Gold Standard, 2017a, 2019a).

Under **REDD+**, the verification of impacts generated under specific standards depends on the respective verification provisions of the standard. For the demonstration of compliance with the Cancun Safeguards, the verification of REDD+ results will be done by independent and external reviewers (the UNFCCC secretariat proposes experts). Here, various means of verification exist: interviews with key government officials and national NGOs, reports, media reports, training materials. The verification process is based on 3 factors: the degree to which reported data can be verified, how verification is performed, and the actors conducting verification (Brazilian Ministry of Environment (Secretariat of Climate Change and Forests), 2016; Ochieng, Visseren-Hamakers, Arts, Brockhaus, & Herold, 2016).

For the **World Bank´s MAAP tool**, there are no requirements for third-party verification, as it is a declaratory tool following a self-evaluation approach (World Bank, 2017b).

Overview of the approaches from selected programmes

The programmes assessed above account for a broad spectrum of MRV approaches. While the MAAP tool does not require any MRV approaches in itself (apart from referencing information sources), VERRA, Gold Standard and REDD+ (and potential standards seeking performance demonstration under REDD+ such as VCS or CCBS) come along with more or less stringent MRV requirements for demonstrating sustainable development impacts.

Hereby, the general concept of developing monitoring plans and reports, and applying a third-party verification appears to be a well-accepted (and well tested) approach. Variations in these

[9] VBBs are entities that can be 1) accredited by a body in compliance with ISO/IEC 17011 OR 2) accredited by members of ISEAL alliance, OR3) accredited VBB of VCS. If point 1&2 are not fulfilled the organisation should show staff's competency with at least 3 years of work experience on similar scopes as the project.

[10] IEE are individuals that can be empaneled through demonstrated competence in 1) a sector in question (5 years work experience/education+work experience) OR2) country experience OR3) either 5 years of experience in managing similar projects or 2 year auditing experience. No conflict of interest must arise for IEEs. The list of VBBs and IEEs are hosted on Verra's website.

approaches exist across standards, for instance concerning project types and concerned sectors. GS offers a certain degree of flexibility concerning the choice of indicators and SDG impact areas, while the verification routes under VERRA allow for different stringency in verification. Again, the intended utilisation of any sustainable development impact that is to be demonstrated does determine the design of MRV and the degree of scrutiny.

The trade-off of transaction costs versus the practicability of demonstrating sustainable development impacts of a project activity is important in the context of MRV design. While a commodified sustainable development impact requires a strong and more complex MRV scheme, the costs for MRV will increase (compared to a non-commodified approach with a less complex process for MRV). However, experiences with carbon market offsetting projects have shown that certain stakeholders are willing to pay a price-premium for increased transparency and certainty about project (SD) outcomes.

The challenge here is to find the right balance between efforts and outcomes of demonstrating sustainable development impacts. Clearly, data availability and measurability of indicators will ease the process of monitoring and verifying impacts in this respect. However, flexibility for project developers to identify suitable indicators and sustainable development impact areas also seems to ease the MRV of sustainable development impacts (as the GS approach shows). REDD+ also allows for flexibility in complying with the Cancun Safeguards, with countries defining their individual safeguards information systems (SIS). Enhanced flexibility of using indicators however will lead to reduced comparability of sustainable development impacts across project activities. This may be challenging in commodified sustainable development approaches, where a certain degree of standardisation is important.

Concerning the political sensitivity of determining sustainable development impacts, over the past few years, the development of the SDGs has contributed to a more universal understanding of sustainable development. Nevertheless, many countries still regard defining sustainable development as a national prerogative, particularly in the context of the UNFCCC negotiations on markets. Here, indicators that can be widely considered as uncontroversial and are reported in a most transparent manner (such as jobs created in a company or number of pupils in a school district) can be helpful to derive a commonly acceptable approach of determining sustainable development impacts. The challenge will be to pick politically acceptable indicators that are still meaningful to a certain extent in the context of the project activity level sustainable development impact demonstration.

Table 4: Analytical overview of the different approaches for MRV in reviewed programmes

	Fulfilment of objectives				**Trade-offs**	
	Identify synergies with the development agenda	*Understanding the significance of links and additionality of impact*	*Improving certainty of integrity in sustainable development impacts*		*Complexity and resource requirements*	*Political sensitivity*
			Ability to determine a quantitative outcome	*Confidence in accuracy of claims*		
Monitoring & Reporting						
Self-reporting	Low-Medium	Low	High	Low	Low	Low
Structured monitoring and reporting approaches with third party scrutiny	High	High	High	High	High	medium
Verification						
Self-evaluation	Low-Medium	Low	Low	Low	Low	medium
Structured verification with third party auditing	High	High	High	High	High	Low

Source: Authors' own elaboration.

Suitability of the identified approaches for different products

The MRV approach is a core issue for all potential objectives of sustainable development impact assessment outlined in section 2 in particular: the demonstration of synergies between climate and sustainable development agenda; the general transparency of sustainable development impacts; and for certainty about project outcomes.

Moreover, it is particularly clear that in terms of demonstrating and ensuring the sustainable development impact of any activity, the degree of transparency and accuracy matters. Any MRV approach is hence strongly influenced by the required level of certainty that stakeholders deem relevant for a certain activity. Here, an important determinant is the intended use of the sustainable development impact demonstration. There are clear implications for the design of the MRV system, whether the envisaged or anticipated sustainable development impacts are for information purposes only, or also for labelling or crediting. While in the former case for information uses and labelling, self-reporting and self-evaluation may be sufficient, in the latter case, a more structured MRV procedure with second or third party scrutiny is required (and internalised in the commodity price) (see Table 5).

Table 5: Suitability of different approaches as per the different types of outputs from sustainable development impacts MRV approaches

Assessment approaches / Products	Information only	Labelling	Crediting
Sustainable development impacts MRV			
Self-reporting only	Potentially sufficient	Potentially sufficient	Insufficient
Structured monitoring and reporting approaches with third party scrutiny	Sufficient	Sufficient	Sufficient
Self-evaluation	Potentially sufficient	Potentially sufficient	Insufficient
Structured verification with third party auditing	Sufficient	Sufficient	Sufficient

Source: Authors' own elaboration.

3.2.3 Consequences of non-compliance with rules and requirements

Programmes set clear rules regarding the consequences a project would face in case of non-compliance with requirements for assessment of impacts. Such compliance checks take place both at the design stage of the project and/or during project implementation (e.g. through MRV).

For ex-ante compliance checks, both Verra SD VISta and Gold Standard for Global Goals require projects to comply with requirements towards impact assessment. Not meeting requirements set out in programme rules during validation leads to rejection of a project proposal. Depending on the standards applied, this can also hold true for REDD+ activities done under voluntary standards. MAAP being a declaratory tool doesn't have such requirements.

Both standards also re-verify compliance with requirements ex-post as part of the MRV requirements discussed in the previous section. Non-conformities can further be reported by any parties involved with the project (e.g. project developer, programme staff) as well as by affected stakeholders (Gold Standard, 2018a, pp. 29–30; Verra, 2019a, pp. 24–26). Both programmes can commission independent investigations and commission experts to review and confirm the raised non-conformities. This is particularly an issue of concern for reversible projects that may face permanence challenges far into the future. While this generally mostly has to do with performance of the stored carbon in the biomass of the forest, sustainable development impacts such as increased biodiversity are directly related to the permanence of the bio-sequestration.

Under both programmes, the **consequences of non-compliance with rules depends on the nature of the breach**. For minor errors or quality issues in the submitted information, data and documentary proofs, rectification or new data is requested. In other cases, for example, in case of valid concerns from stakeholders, projects developers may be asked to modify certain practices or have their projects or products (i.e. issued credits or labels) temporarily suspended. If severity of issues is confirmed, both standards can in principle also remove the registered project and cancel any issued certified credits and labels. However, programmes claim that cases of such severe non-conformities have been rare.[11] Again, depending on the selected standard, various approaches towards non-compliance may exist under REDD+.

[11] As per interviews with the programmes.

Practices in the reviewed programmes suggest the programme level rules on consequences of non-compliance with sustainable development impact assessment requirements should be in place, irrespective of the purpose of the assessment.

3.3 Case studies from existing climate change mitigation projects

Section 3.2 considered the structure of approaches employed from different programmes for sustainable development assessment. In this section, approaches from two specific mitigation projects are documented to supplement the findings of the previous section with practical examples of projects.

Case studies are presented from the following climate change mitigation projects:

- Kariba REDD+ Community development protects forests
- Gold Standard's Dak Pone Hydro Power Project

The projects were developed under old versions of Verra standards (Kariba) and the Gold Standard (Dak Pone), so not under "SD VISta" and "GS4GG". While being aware that the cases therefore represent outdated standard versions, the examples are still considered as insightful as they allow for an analysis of activities over a longer period, including for instance the respective verification cycles.

3.3.1 Kariba REDD+ Community development protects forests

The "Kariba REDD+ Community development protects forests" project, applies a combination of standards to demonstrate sustainable development impacts. Impact categories are differentiated by "climate", "community/social" and "biodiversity". Verra´s standards are used (project ID 902) (Verra, 2017) and marketed in the form of issued Verified Carbon Units (VCUs,) - the climate impact being measured and verified with the Verified Carbon Standard (VCS), while the community/social as well as biodiversity are implemented to abide by the Climate, Community & Biodiversity Standards (CCBS) (Verra, 2019), second edition.

Project design

Since 2011, the Kariba REDD+ project has sought to reduce deforestation and land degradation on the southern shores of Zimbabwe's Lake Kariba. The project claims to create jobs and facilitate sustainable incomes, through for example conservation agriculture, community gardens, beekeeping training, fire management and ecotourism activities. An innovative element is the project's *Community and Project Sustainability Fund*, which is supposed to be fed from revenues of the project's Verified Carbon Unit (VCU) sales, for investing into activities that promote and guarantee project sustainability (South Pole, 2017b).

Sustainable development impacts of the project

In addition to reducing carbon dioxide emissions, the project intends to create several social and economic co-benefits. These are financed through the Community and Project Sustainability Fund. These comprise infrastructural and economic development (such as new roads and new boreholes), better health care (through improving clinic amenities) and wellbeing of the local community (e.g. school subsidies available for the poorest quartile of the population). With respect to specific SDGs, the project impact is reported by the project as follows:

- SDG 13 (Climate Action): 1,730,865 tCO_2e mitigated annually
- SDG 15 (Life on Land): 784,987 hectares of land is conserved and protected

- SDG 1 (No Poverty): 85,000 people benefiting from project activities (through better health care system or infrastructural or economic development)
- SDG 5 (Gender Equality): 40% of the project participants are women
- SDG 6 (Clean Water and Sanitation): 20,000 people benefit from safe, clean water through borehole maintenance
- SDG 8 (Decent Work and Economic Growth): Overall 70+ trainings which potentially create new jobs and promote sustainable incomes that benefit the whole community

How are sustainable development impacts demonstrated?

Approaches for assessment of sustainable development impacts

With its application of VCS and CCBS standard procedures, the Kariba REDD+ project purports to apply an active assessment of impacts against a baseline.

Approaches for safeguarding against negative impacts

Section 6 illustrates the spectrum of areas in which it is necessary to safeguard against negative impacts, including risk identification, safeguarding principles, dedicated impact assessments, stakeholder engagement, and grievance mechanisms. In terms of safeguards and avoidance of negative impacts, the CCBS generally requires that project activities produce net positive impacts on environmental, social and economic well-being of all community groups, ensuring that costs, impacts and risks are identified. During the implementation phase of Kariba, potential negative impact and risks are identified, monitored and assessed in consultation with various stakeholders. A monthly newsletter containing information about the general project process, environmental awareness, grievances and vacancies is published to the rural district councils and local communities. Furthermore, a summary of the monitoring and implementation report is translated into local languages and is made available to the public through the CCBS website and offices of the rural district councils. Any involved stakeholder can submit grievances directly to the rural district councils, CGA (Carbon Green Africa) or OGM (on the ground management) head offices (Eaton, 2017; Institute for Global Environmental Strategies, 2016; Marcarini & Silber, 2016) at any time.

It is unclear if grievances were submitted, but local press articles and interviews suggest the project was not necessarily well coordinated with local stakeholders, and did not deliver on the ground in all villages, sometimes leading to conflict (Dzingirai & Mangwanya, 2015; Gogo, 2014).

Although the general approach for safeguarding in the project appeared to be well designed, the reported issues in the implementation of the approach lead to useful lessons for future projects. Since compliance with the standards focused primarily on the provision of upfront information on the approach, information about its actual implementation is lacking, leading to uncertainties with regards to how well the approach has worked in reality. Details on the implementation of grievance mechanisms should be kept transparent and up to date, and this should be monitored and verified, both to ensure that the approach is implemented as planned, and to increase transparency with regards to the effectiveness of the approach design.

Approaches for Monitoring, Reporting and Verification

The Kariba project employs a structured MRV approach with third party auditing. The GHG mitigation impacts are measured in accordance with the VCS (methodology VM0009) Verra, 2017b).

For the community/social dimension, the impacts are categorised into direct and indirect effects. While direct effects are monitored through evaluating data reported by so called "on the ground management (OGM) teams", indirect effects are monitored by interviewing a sample of rural district households and people operating in the project area. Concerning indirect effects, guiding questions are asked about the satisfaction and perceived impact of the project, which also examine the general situation along indicators regarding annual household income, number of household members, views towards the project, etc.

For measuring the biodiversity and environmental impacts of ongoing activities and the biodiversity of flora and fauna in the project area, a set of indicators is developed and stated in the CCBS monitoring plan accordingly. This includes, for instance, the number of snare wires found, number of poachers arrested, poached game encountered, team-days spent patrolling, species sighted in the field, the number of animals per species, number of threatened species, tree species observed in the biomass sampling plots and number of individuals per tree species. Such indicators are self-identified and proposed by project developers under the CCBS.

Data collection for monitoring takes place continuously in line with the project activities and is reported upon verification under the CCBS. The verification of impacts is done through the dedicated verification process for the project under Verra (VCS and CCBS procedures), through a combination of document review, interviews with relevant personnel and on-site inspections.

Objectives and trade-offs for the use of sustainable development indicators under the project

As per its concept, the project applies a complex approach for demonstrating sustainable development impacts, with an active assessment against a baseline, several approaches for safeguarding, and a structured MRV approach with third party auditing elements – all involving numerous indicators. This approach for ensuring sustainable development impacts comes with high transaction costs, but at the same time allows for an enhanced understanding of the synergies of GHG mitigation and SDGs, improves the transparency on the additionality of impacts, and improves the certainty of the perceived impacts. The monetisation of impacts (in this case the GHG mitigation) requires a thorough treatment of impact demonstration, but these efforts directly benefit the overall project by supporting other impact areas through the Community and Project Sustainability Fund.

3.3.2 Sustainable development impacts under Gold Standard's Dak Pone Hydro Power Project

The "Dak Pone Hydro Power" Gold Standard project, was developed as a Clean Development Mechanism (CDM) project and provides sustainable and reliable energy to the surrounding community of the province of Kon Tum, Vietnam. The project generates certified GHG emission reductions (CERs) with a Gold Standard label and demonstrates certain sustainable development impacts.

Project design

According to the CDM project description (CDM PDD Dak Pone Project, 2010), through the installation of two hydropower plants (on the Dak Pone River (14 MW) and Dak Ne River (1.6MW)) the dependency of people on carbon-intensive energy generation such as diesel generators and wood-fired heating and lighting can be reduced. As a result, the project claims to contribute to improved indoor/outdoor air quality and better health conditions. Furthermore, the project activity shall enable the surrounding forest to regenerate and shall support the entire regional economy through investments in infrastructure (construction of irrigation canals, bridges and roads).

Sustainable development impacts of the project

In addition to reducing GHG emissions, the project proponents claim to contribute several social and economic co-benefits, importantly the economic development and industrialisation process of the whole Kon Tum province. Moreover, the installed hydropower plants shall provide income to the state budget by means of a revenue tax, a natural resource tax and a tax on CER revenues. Furthermore, it is claimed that the newly created electricity source leads indirectly to decreased losses of electricity and improved stability of electricity supply. As project implementation requires an improved infrastructure system, it is claimed that roads, communication system and water supply will be improved for the benefit of the local communities. Overall, the project envisages that its activities lead to employment of local people, contributing to improvement of living conditions and alleviation of poverty in region. In terms of SDGs, the project reports the following impacts:

- SDG 13 (Climate Action) (minimum target): Leading to a reduction of 30,000 tCO_2e per year and thus directly contributing to climate change mitigation (Gold Standard, 2014; South Pole, 2017)
- SDG 7 (Affordable and Clean Energy): Production of 69,100 MWh (annually) of clean energy and provision to surrounding communities
- SDG 8 (Decent Work and Economic Growth): Creation of 21 new jobs in 2016
- SDG 9 (Industry, Innovation and Infrastructure): Construction of new roads, bridges and irrigation canals

How are sustainable development impacts demonstrated?

Approaches for assessment of sustainable development impacts

Applying the Gold Standard, sustainable development impacts under the Dak Pone project are demonstrated in a structured manner, inter alia by using a scoring approach. Hereby, procedures of the Gold Standard are applied, including the use of indicators under the Gold Standard sustainable development matrix (and the selection of 3 SDG´s in more recent validation reports)[12]. Here, each indicator can score +, -, or 0. Indicators are measured quantitatively and qualitatively. Monitoring reports obtain detailed information of outcomes (e.g. number of jobs created by project activities).

The following indicators are assessed against a baseline: Air quality, water quality and quantity, soil condition, other pollutants, biodiversity, quality of employment, livelihood of the poor, access to affordable & clean energy services, human and institutional capacity, quantitative employment and income generation, access to investment, technology transfer and technological self-reliance.

Approaches for safeguarding against negative impacts

Section 5 illustrates the spectrum of opportunities for safeguarding against negative impacts, including risk identification, safeguarding principles, dedicated impact assessments, stakeholder engagement, and grievance mechanisms. The Dak Pone project sought to address several of these approaches. The project develops 11 safeguarding principles (based on the Gold Standard's vision and mission) and conducts an environmental impact assessment. A “Do no Harm” assessment is carried out according to the project proponent’s project documentation (mainly Environmental Impact Assessment Report), the relevant national/local regulations, and

[12] The sustainable development matrix has been discontinued and its requirements integrated in the Gold Standard for Global Goals.

the approved procedures for the project. Potential negative impacts of project activities are identified (environmental impact assessment) and categorized (into social, and environmental negative impacts). During the construction period, project activities such as material exploitation, material transportation, mine explosion and road construction cause temporary air pollution and affect local environments negatively. The main socio-economic negative impact, which is reported by the project in line with the requirements of the Gold Standard, is the occupation of 116,072 ha land, of which 21,151 ha is agriculture area. According to the governmental regulations and as stated in the GS Passport[13], the occupied land was compensated adequately.[14] Although 24 households are affected, there is apparently no need for resettlement as the occupied land is used for e.g. farming purposes, but not as residential area or settlements.

To minimise negative impacts, different mitigation measures were proposed (such as spraying water for avoidance of dust, among others). Information on which stakeholders have been consulted is available and meets the requirements of the GS. The input and feedback concerning all sustainable development dimensions (both positive contributions and potential risks) raised by the stakeholders is collected and a summary of stakeholder comments is integrated into the project design.[15] In addition, stakeholders were to be involved in further process steps such as the monitoring plan development (e.g. contributing ideas on how to monitor the indicators which were scored positive) (CDM PDD Dak Pone Project, 2010; Deloitte Tohmatsu Evaluation and Certification Organization, 2014; Gold Standard, 2014, 2017e).

Approaches for Monitoring, Reporting and Verification

The project applies a structured approach for MRV with third-party auditing. The sustainability impacts are assessed through Gold Standard specific guidance at that time ("Annex I: Guidance on sustainable development indicators" and "Annex G: Sustainable Development for Hydro"). Based on this a sustainable development matrix is developed, where indicators are being rated with "–" (negative impact), "=" (neutral), "+" (positive impact). A sustainability monitoring plan specifies the indicators to be monitored. For this project these indicators comprise: Quality of employment, other pollutants, quantitative employment and income generation, air quality, water quality and quantity, soil condition, biodiversity/fish passage; for each indicator specific parameters are named, and a baseline and project situation are described. Those reported indicators are verified through third party scrutiny, under the Gold Standard by a GS-VBB (Deloitte-TECO appointed a team with lead auditor Koichiro Tanabe).

Objectives and trade-offs for the use of sustainable development indicators under the project

At the time when the project was designed and commissioned (in 2009/2010), international carbon markets were experiencing a boom, and project developers often opted for extra demonstration of "co-benefits", i.e. sustainable development impacts, through certification institutions such as the Gold Standard. A clear motivation at that time was the price premium per unit of certified GHG emission reduction that could be achieved with demonstration of such additional impacts. The trade-off of additional transaction costs for demonstrating sustainability beyond the GHG emission reduction dimension was acceptable under the circumstances the project was developed in – the demand for high quality carbon credits was high enough for

[13] The GS Passport as a project documentation has been discontinued and its requirements are integrated in the Gold Standard for Global Goals.

[14] Households who have lost their land receive compensation in cash. They must agree their resettlement beforehand. According to Vietnamese Law, the programme is obliged to compensate local impacted for occupied land. However, from the documentation it is not clear how deep GS was scrutinizing on this issue.

[15] Stakeholders were consulted in advance and their comments and concerns have been considered in the project design. A grievance mechanism is in place for communicating concerns of stakeholders, which is constantly checked and verified by the third-party auditor during the verification process.

compensating for the extra costs through price premiums. The application of this approach has contributed to enhanced understanding of the synergies of GHG mitigation and the development agenda.

3.4 Summary of findings and implications for next steps

In this section, we created a typology of approaches programmes use for carrying out sustainable development impact assessment and systems of MRV. In our assessment, **the requirements of sustainable development impact assessment cannot be generalised but depend on the purpose of the assessment under a specific programme or project**, i.e. whether the envisaged or anticipated sustainable development impacts are simply used to market programmes ("information only"); or whether sustainable development impacts are commodified, either by using the results as a marker on GHG credits ("labelling"), or with the intention of creating sustainable development credits ("crediting"). Some purposes may require more stringency, accuracy and detail than others, which can somewhat justify the resulting trade-offs for resource expenditure. While a perfect assessment is not possible, a conscious decision should be made on the balance between rigour and pragmatism for the assessment approach, with the stringency informed by the purpose of the assessment.

In the case of informational uses, a '*simple identification of potential impacts*' approach may be sufficient as it can provide an enhanced understanding of the links to the development agenda without incurring significant transaction costs due to related complexity of the assessment. However, if sustainable development benefit assessment is carried out to commodify the outcome, either by labeling GHG credits or creating standalone sustainable development impacts credit, proving certainty of claims is indispensable. In such cases *assessment of impacts against a baseline* should be necessary to provide the most clarity and certainty. Similarly, the intended use of the sustainable development impact demonstration has clear implications on the design of the MRV system, i.e. information, labelling, crediting. For informational purposes, self-reporting and self-evaluation could be sufficient depending on the required quality and comparability of the information provided. In other cases, a more structured MRV procedure with second- or third-party scrutiny might be required (and internalised in the commodity price).

Overall, we find that programmes should be carefully designed to ensure that the approach taken provides the right level of incentive for appropriate sustainable development impact assessment, in order to realise the potential rationale for the assessment. Awareness of sustainable development impacts can facilitate projects to adjust their designs to maximise those outcomes, even if those outcomes are not explicitly commodified by programmes, but this requires that incentives are in place to consider those links already at the project planning stage.

The two case studies from VCS with CCBS and the Gold Standard illustrate how different assessment approaches are being used to demonstrate sustainable development impacts using indicators. Both cases underscore that a structured and comprehensive approach towards indicators for sustainable development impact demonstration can indeed contribute to improving the understanding of synergies with the development agenda. The cases also show that the structured MRV approach with specific sets of indicators and third-party scrutiny has the potential to increase the transparency on the additionality of the impact, as well as to improve the certainty of the perceived impacts. However, both projects also make clear that enhanced demonstration of sustainability does come with extra transaction costs for highlighting specific impacts. In these particular cases, the transaction costs are ultimately borne by buyers of carbon certificates.

The trade-offs explored between enhanced sophistication of assessment approaches, and higher transaction costs, show that pragmatic approaches are needed to reduce the resource burden associated with stringent sustainable development impact assessment. Hence, the rigour and granularity of assessment should be as simple as possible, while providing the detail and accuracy necessary for the specific purpose. In the next section, we will explore how indicators for sustainable development impact assessment can be optimized towards this objective.

4 Effective indicators for sustainable development impact assessment

In this section, project-level indicators for sustainable development are identified and assessed, related to their ability to deliver on the potential objectives for sustainable development indicators identified in section 2. Based on the assessment, a short list of 12 indicators is selected for further analysis in section 5.

4.1 Sustainable Development Goals and links to project-level impact indicators

A challenge for the assessment of sustainable development impacts under Article 6 is to identify indicators that can transcend the variety of positioning on the definition of sustainable development. In this context, the *2030 Agenda for Sustainable Development* – universally agreed by all UN member states in 2015 – can provide an overall framework for how to approach these issues and objectives for both developed and developing countries. The 2030 Agenda sets out a list of agreed high-level goals and specific targets as the blueprint for sustainable development. The 17 Sustainable Development Goals (SDGs) are broken down into 169 targets and then further into 232 unique indicators to provide a mutual understanding of what sustainable development entails, as well as how to measure it. Since the adoption of the 2030 Agenda and the SDGs, many countries have developed national strategies and action plans to set the SDGs and their targets in their own national context.

A growing body of literature indicates a broad range of synergies between climate change projects in different sectors, and the goals, targets, and indicators of the 2030 Agenda for Sustainable Development. Table 6 gives an overview of the Sustainable Development Goals along with an indication of the extent to which climate change mitigation projects may impact them, based on the SCAN tool. The table shows that mitigation projects can have a relevant impact on all SDGs, with particularly strong links to SDGs 8, 9, 11 and 15.

Table 6: Overview of Sustainable Development Goals and links to mitigation projects

Sustainable Development Goal	Links identified to mitigation projects in the SCAN tool
1 - End poverty in all its forms everywhere	Limited
2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Limited
3 - Ensure healthy lives and promote well-being for all at all ages	High
4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	Limited
5 - Achieve gender equality and empower all women and girls	Limited
6 - Ensure availability and sustainable management of water and sanitation for all	High
7 - Ensure access to affordable, reliable, sustainable and modern energy for all	Medium
8- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Very high

Sustainable Development Goal	Links identified to mitigation projects in the SCAN tool
9 - Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation	Very high
10 - Reduce inequality within and among countries	Limited
11 - Make cities and human settlements inclusive, safe, resilient and sustainable	Very high
12 - Ensure sustainable consumption and production patterns	High
14 - Conserve and sustainably use the oceans, seas and marine resources for sustainable development	Medium
15 - Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Very high
16 - Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	Limited
The SCAN-tool (SDGs & Climate Action Nexus tool), developed by NewClimate Institute in collaboration with ECN part of TNO, can help identify and understand which climate mitigation actions may - positively or negatively - impact specific SDG targets (Gonzales-Zuñiga, Roeser, Rawlins, Luijten, & Granadillos, 2018). The tool covers actions across seven mitigation sectors and collects data from several studies on the nexus between climate mitigation action and specific development areas. A detailed description of the rating in this table is given in *Annex I.* SDG 13 (climate action) is excluded because the aim is to identify links between climate actions and other development areas, thus these links are implicitly represented. SDG 17 (partnerships for the SDGs) is not included because it is not a development area comparable to the other SDGs.	

Source: Authors' own elaboration.

The breadth of the synergies between mitigation project activities and the achievement of the SDGs, along with the universal acceptance of the SDG as markers for sustainable development, make it highly appropriate to consider the impact towards SDG targets when defining indicators for sustainable development impact at the project level. The 232 indicators linked to the specific SDGs and targets16 provides for a point of departure.

However, the agreed SDG framework requires interpretation to apply or make them relevant at an activity level.

[16] For the full list of SDG indicators refer to: The following link leads to the Internet: https://unstats.un.org/sdgs/indicators/indicators-list/

Table 7 shows that the degree to which the formally agreed SDGs indicators can be used on the project-level varies, depending on the nature of the SDG indicator. In some cases, project-level activities directly influence the achievement of the SDG target and the SDG indicators may be directly applicable. However, since the majority of SDG targets are related to outcomes at the macro level (i.e. at the global or national level), not all the targets and their indicators are directly relevant to activities at the micro-level, such as individual climate change mitigation projects. In some cases, where there is a potential indirect link between the project and the SDG target or indicator, proxy indicators could be used to identify the link. In other cases, the SDG target indicators may not be applicable to the project context at all.

Table 7: Applicability of SDG targets and indicators to project level impact indicators

SDG indicators from SDG targets 5.5 and 8.5

SDG indicator	Applicability as project-level impact indicator	Explanation and example
5.5.1 Proportion of seats held by women in national parliaments and local governments	Not applicable in project-context	Indicator is related to outcomes at the political level, therefore not applicable in the project-context
5.5.2 Proportion of women in managerial positions	Applicable on project-level	Indicator can be directly measured at the project-level
8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	Applicable on project-level	Indicator can be directly measured at the project-level
8.5.2 Unemployment rate, by gender, age and persons with disabilities	Transferable to project-level	Proxy indicator: Number of employees in new positions created by the project by gender, age and persons with disabilities

The SDG indicators from SDG targets 5.5 and 8.5 are included as an exemplary illustration of the different ways that SDG indicators can be applicable at the project level.
Source: Authors' own elaboration.

Of the 232 unique indicators identified in the 2030 Agenda framework, we find that approximately 4% of the indicators may be directly applicable at the project level. A further 30% could potentially be indirectly applicable and transferable to the project-level through proxy indicators.

4.2 Identification of project-level indicators for sustainable development impact

Section 4.1 found that some of the indicators of the SDG framework could be relevant for the measurement of impact on the level of specific mitigation project activities, but that the macro-level nature of many of the SDG targets means that the relevance of the SDG indicators for use at the project-level is limited.

Table 8 gives an overview of the approaches towards sustainable development indicators used by the various project-based programmes. The table shows that most programmes refer to the SDG indicators as a reference or starting point when defining project-level impact indicators.

Table 8: Project based programmes and their approach to project-level impact indicators

Programme	Indicator approach
Gold Standard for Global Goals	Indicators are defined on the individual project-level and project developers can either use specific indicators from GS methodologies or GS tools, or define their individual indicators, if applicable in alignment with SDG indicators.
Verra sustainable development VISta standard	The SDG indicator set is used as a reference and individually translated to the project-level where applicable, therefore no universal set of indicators is available

Programme	Indicator approach
Verra CCB Standards	22 standardised indicators grouped into 11 impact categories are available for application at the project-level
UN REDD+ Social and Environmental safeguards	Indicators for demonstrating compliance with the Cancun safeguards are individually developed on the country-level, therefore no universal set of indicators is available
World Bank Mitigation Action Assessment Protocol	MAAP only provides a short list of meta-indicators (e.g. "consideration of possible negative impacts of the mitigation action") and refers to the official SDG indicator list for measuring contributions towards sustainable development

Source: Authors' own elaboration.

In addition to the project-based programmes in Table 8, we have also considered two programmes that do not define sustainability indicators at the activity level– the UN Human Development Index (HDI) and the WHO World Health Statistics. These programmes provide country-level indicators for the assessment of the state of human development and health and link directly to the SDGs. However, because of their macro-nature, the HDI and WHO World Health Statistics, while informative, have limited applicability to the analysis for sections 4.3 on.

- **UN Human Development Index**: The Human Development Index (HDI) monitors indicators for measuring the life expectancy, education, and per capita income. These are explicitly linked to certain SDG targets. Additionally, dashboards on environmental sustainability, socio-economic sustainability and gender equality are available which track progress towards related SDG targets. The SDGs covered are: 1, 3-10, 12, 15, 17. The indicators monitored are 'official SDG indicators' and are measured on the national level, and not on an activity level e.g. the share of population using improved sanitation facilities (related to target 6.2). The indicators are measured on a yearly basis using data from international organisations such as the World Bank, International Labour Organisation (ILO), the World Health Organisation (WHO), etc.

- **WHO World Health Statistics**: Similar to the HDI, the WHO also monitors 36 health-related official SDG indicators by country, based on WHO regions, and globally on a yearly basis. It publishes an annual report called 'WHO health statistics'. The report provides information on the overall national progress on health-related SDG indicators, e.g. the malaria incidence rate (related to SDG target 3.3).

In addition to the project-level indicators already used by the programmes analysed, other tools such as the UNDP Climate Action Impact Tool and the ICAT Sustainable Development Guidance, and sector specific academic studies suggest other relevant indicators. The UNDP Climate Action Impact tool is a bottom-up tool that enables stakeholders to identify and quantify impacts of mitigation actions towards sustainable development (UNDP, 2017). The tool is separated into six impact categories that are linked to the relevant SDGs. The robustness of the output depends on the quality and extent of the quantitative and qualitative data provided by the user. The ICAT Sustainable Development Guidance provides modular guidance that helps users to systematically assess the social, economic, and environmental impacts of policies and actions. It includes an exemplary set of indicators in various impact categories.

An analysis of the SDG indicator framework, the programmes and indexes analysed in Section 3, and further relevant sources, shows that a total of 217 indicators - including nine SDG indicators

- are actively used or are at least potentially applicable to measuring impacts at the project-level. A full list of these indicators is given in Annex II.

This extensive list of indicators makes it necessary to group or shortlist the project-level impact indicators in one way or another to allow for in-depth analysis. It is common practice to group indicators as well as SDGs into different categories, dimensions or themes. The CDM sustainable development tool uses the three dimensions of sustainable development, the so-called "three pillar approach" representing the social, environmental, and economic dimensions, which are further characterized according to different criteria, that were developed from a bottom-up review of aspects of sustainability, as reported by project developers (Olsen, Bakhtiari, Duggal, & Fenhann, 2019). These criteria can be seen as impact categories for indicator classification.

Classifying indicators according to impact categories provides a clear categorisation where one indicator is only linked to one impact category, compared to an approach where one indicator could be linked to several SDGs. Further, categorising indicators into impact categories helps to structure indicators along common types of impacts, thus reducing the complexity of the assessment.

Table 9 gives an overview of the impact categories as defined in the CDM sustainable development tool along with an indication of their SDG linkages and the extent to which they are covered by the identified project-level impact indicators.

The SDG framework suggests a grouping of sustainable development impacts under two categories– "planet" and "people and their prosperity". The latter includes both what was classified in the CDM SD tool under the "three pillar approach" as environmental, social and economic impacts. The combined categorisation into "people and their prosperity" recognises that these impacts are intrinsically linked and thereby acknowledges a critique of the "three pillar approach" namely that issues described as economic could be considered to be more macro-level versions of the social issues, which are also economic in the nature but more relevant outside of the macro-level.

Table 9 shows that impact categories in the economic dimension are less well covered by existing indicators for project-level activities, as these are focused more towards macro-level outcomes that are not easily connected to project-level impacts. By contrast, there are particularly many indicators for the impact categories welfare, health & safety and air.

Table 9: Impact categories and project level impact indicators

Impact Category	Sustainability Dimension	Links identified to project-level impact indicators	Links identified to SDGs
Air	Environmental/ Planet	21	SDG 3, 11
Land	Environmental/ Planet	23	SDG 11, 12, 15
Water	Environmental/ Planet	20	SDG 6, 14
Natural Resources	Environmental/ Planet	17	SDG 11, 15
Jobs	Social/ People and their prosperity	15	SDG 8
Health & Safety	Social/ People and their prosperity	24	SDG 2, 3, 6

Impact Category	Sustainability Dimension	Links identified to project-level impact indicators	Links identified to SDGs
Education	Social/ People and their prosperity	10	SDG 4
Welfare	Social/ People and their prosperity	37	SDG 1, 5, 10, 11, 12
Growth	Economic/ People and their prosperity	10	SDG 9
Energy	Economic/ People and their prosperity	4	SDG 7
Technology	Economic/ People and their prosperity	2	SDG 11
Balance of Payment	Economic/ People and their prosperity	9	SDG 7

Source: Authors' own elaboration.

For the analysis of effective criteria for project level indicators in the next section, we shortlist four impact categories – *land, education, welfare* and *balance of payment* – for a more targeted assessment.

- From the social pillar, the impact category **Welfare** is shortlisted because it has the most indicators, covers many different sustainability aspects and SDGs and therefore offers the most in terms of diversity and potential lessons learned;
- In contrast, we also shortlist **Education** because it has the fewest indicators: it is interesting to understand if this is the case because the category is less complex and can be easily captured with a small set of indicators or so difficult to measure that only a few indicators are relevant.
- From the environmental pillar, we shortlist the impact category **Land**, which covers most indicators, including most SDGs from the environmental pillar. Moreover, compared to the categories Air and Water, Land has been the subject of comparatively less attention in existing research and programmes.
- From the economic pillar, we shortlist the impact category **Balance of Payment**, as it is the one most applicable to the project level when comparing the categories within the economic pillar.

4.3 Determining criteria for effective indicators

Identification of potential issues for indicators

In order to determine criteria for effective indicators, we first reviewed the full list of indicators to identify what types of issues undermine an indicators' ability to effectively deliver on the objectives for sustainable development impact assessment may arise.

We identified the following potential issues:

1. Indicators may be vague and not refer to specific outcomes, which makes it difficult to understand exactly what the link is, or to assess it with any degree of accuracy;
2. Even in the case that a specific outcome or impact is referred to, for some indicators, there may not be an apparent direct link to the project-level which can assist in drawing a conclusion regarding a cause-and-effect relationship;
3. Some indicators are not conducive to the use of quantitative metrics, which detracts from the ability to accurately assess the impact in a transparent way;
4. Some indicators are highly complex and appear to require either significant amounts of data from third-parties, or calculations that would involve assumptions. This could represent an increased burden in order to monitor the indicators; and
5. Indicators may also involve issues that some may see as politically sensitive, which can detract from the ability to implement them in a practical context.

These five issues are considered in greater detail in the context of the objectives for sustainable development impact assessment in the next sub-section. However, not all of the identified objectives are relevant for all programmes and purposes. Developing indicators and approaches to meet all objectives would likely lead to higher transaction costs for monitoring, reporting and verification, which represents an inherent trade off that requires a consideration of the objective of the impact assessment.

Criteria for effective indicators

In this section, we assess the issues identified above based on their ability to deliver on the potential objectives and mitigate against the trade-offs of using sustainable development indicators, as identified in Section 2 in order to define criteria for effective indicators.

Objective: Promote an *understanding of synergies* between mitigation action and development agenda

In order to support an enhanced understanding of the links between mitigation action and the development agenda, indicators need to be clear about precisely what outcomes they are measuring. In this regard, indicators that assess a specific individual metric offer a better understanding than indicators that combine multiple impacts into an aggregated score or index. The following examples help illustrate that difference:

Example 1: *Additional number of households with access to clean energy (from UNDP Climate Action Impact tool)*

Example 2: *Progress towards sustainable forest management (SDG Indicator)*

While the first example indicator measures a specific metric (*additional number of households*) and a clearly defined outcome (*access to clean energy*), the second indicator only includes a vague metric (*progress*) as well as a broad outcome (*sustainable forest management*).

Based on this, one can define the following criteria for how indicators can effectively deliver on the objective to promote an understanding of the synergies between mitigation action and the development agenda:

Criterion 1: The indicator refers to a specific individual outcome.

Objective: *Improve transparency* in the way in which the activity affects development outcomes to determine the additionality of impacts

Indicators have to be suitable for the spatial scope the SD impact is to be assessed in (e.g. supporting the local economy by providing jobs), beyond the immediate geographic boundaries on a macro scale (e.g. impact on balance of payments, towards national sustainable development plans). In order to improve transparency in the way in which an activity affects certain

development outcomes, indicators need to demonstrate a direct and inherently clear cause-and-effect relationship between the activity and the development impact. An impact arising from an activity is additional if it clearly would not have occurred in the absence of the activity. This is related to discussions of causation versus correlation in that it is clear that other trends are not likely to have brought about the impact. For carbon market mechanisms this is often referred to as additionality. In order to evaluate the additionality of an impact it is therefore important to be able to apply the indicator to a baseline as well as the activity scenario. Additionality may be difficult to objectively prove for socioeconomic outcomes but is particularly relevant in cases where quantified sustainability outcomes are monetised or attract a price premium, to ensure that such outcomes are not "double counted".

Example 1: *Additional villages with access to grid (UNDP Climate Action Impact Tool)*

Example 2: *The action enables industries to pursue resource efficient business practice and greater adoption of clean technologies (UNDP Climate Action Impact Tool)*

For a case where the first indicator was, for example, applied to a project activity related to mini-grids, causation is easily demonstrated. In comparison, looking at the second example indicator, the relationship between the activity and impact is less direct and would be more difficult to assess. Based on this, one can define the following criterion:

Criterion 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.

Objective: *Improve the certainty* of the perceived impacts for sustainable development outcomes

The required level of certainty on the perceived impacts for sustainable development outcomes depends on the envisaged use of sustainable development assessment; if outcomes are to be credited and commodified, then a high level of certainty is desirable, while in other cases the stringency of outcome certainty may be considered less important than other objectives. An enhanced certainty of the impacts depends on the following:

Ability to determine a quantitative measurement

Quantitative indicators are widely used in development projects as they give a clear measure and are numerically comparable. This enables project developers to compare the achievements between different projects as well as of the same project at different points in time. In general, quantitative indicators are more objective and do not require a judgement for quantification. In contrast, qualitative indicators capture qualities that are descriptive, subjective and generally more difficult to measure. Further, the ability to quantify an outcome enables an enhanced understanding on the scale of the impact. The examples already used for the first objective clearly illustrate the difference between a quantitative metric and a more qualitative one:

Example 1: *Additional number of households with access to clean energy (from UNDP Climate Action Impact tool)*

Example 2: *Progress towards sustainable forest management (SDG Indicator)*

Based on this, the following criterion is identified:

Criterion 3: The indicator is a quantitative metric.

Confidence in the accuracy of the measurement

In order to provide confidence in the measurement accuracy, it is necessary to assure that the measurement is reliable. The reliability is impacted by the quality of data and the use and appropriateness of input assumptions. Depending on the approaches to the quantification of outcomes, methodological error margins may affect the confidence of measurement accuracy.

Based on this, the following criteria are identified for how confidence in the accuracy of the measurement can be improved:

Criterion 4: The indicator can be determined without calculations which require input assumptions.

Trade-off: Pragmatism of project design and operation

As highlighted before, identifying pragmatic ways to outline actionable and monitorable indicators which can to a certain extent avoid political reservations is a challenge in the uptake of sustainable development indicators in market-based mechanisms. It is therefore relevant to identify those indicators which can optimise the costs borne by project developers during the project design and operation. This involves considering what indicators are already being monitored and what data is available to limit the costs of data collection. Further, the complexity of corresponding MRV measures should be considered. We acknowledge that complexity of MRV is a vague concept that is difficult to assess, which is why we analyse it in more depth in Section 5.

Criterion 5: The complexity of the MRV is manageable.

Criterion 6: The indicator can be monitored with own information and data (do not need to be sourced from elsewhere).

Trade-off: Political sensitivity

A central aspect in overcoming the political sensitivity of standardised indicators is to identify synergies between project-level impact indicators and the SDG goals, targets and indicators, because they are based on a global agreement and are universally accepted as markers for sustainable development. It is further helpful for overcoming potential sensitivities if domestic legislation related to the indicators or international laws and treaties exist, which already set requirements for the indicator and therefore signal or incentivise political acceptance.

Criterion 7: The indicator relates to specific targets of the SDGs.

Criterion 8: The indicator directly relates to national legislation or international treaties.

Table 10 provides a summary overview of the criteria identified for indicators to deliver on these aforementioned objectives for sustainable development indicator use and the possible assessment ratings.

Table 10: Criteria for indicators to deliver on potential objectives

Potential objective for sustainable development indicator use	Criteria	Assessment
1. Promote an understanding of synergies	The indicator refers to a specific individual outcome.	Yes/ No
2. Improve transparency in the causal relationship to ensure additionality	The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.	Low/ Medium/ High
3. Improve the certainty of the perceived impacts		

3.1 Ability to determine a quantitative measurement	The indicator is a quantitative metric.	Yes/ No
3.2 Confidence in the accuracy of the measurement	The indicator can be determined without calculations which require input assumptions.	Yes/ No
4. Pragmatism and cost of project design/ operation	The complexity of the MRV is manageable. The indicator can be monitored with own information and data.	Low/ Medium/ High Yes/ No
5. Political sensitivity	The indicator relates to specific targets of the SDGs. The indicator directly relates to national legislation or international treaties.	Yes/ No Yes/ No

Source: Authors' own elaboration.

Table 11 shows how the identified criteria relate to the specific purposes of programmes.

Table 11: Relation of criteria and purposes of programmes

<table>
<tr><th></th><th rowspan="2">Assessment for informational purposes</th><th colspan="2">Assessment for commodification</th></tr>
<tr><th>Labelling scheme</th><th>Crediting scheme</th></tr>
<tr><td>Criteria to address general objectives for sustainable development impact assessment in indicators</td><td colspan="3"></td></tr>
<tr><td>Criteria 1: The indicator refers to a specific individual outcome.</td><td colspan="3">Fulfilment of the criteria is essential for the purpose.</td></tr>
<tr><td>Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.</td><td>Fulfilment of the criteria is beneficial and important for the purpose.</td><td>Fulfilment of the criteria is beneficial and important for the purpose.</td><td>Fulfilment of the criteria is essential for the purpose.</td></tr>
<tr><td>Criteria 3: The indicator is a quantitative metric.</td><td>Fulfilment of the criteria is beneficial but not always prioritised</td><td>Fulfilment of the criteria is beneficial and usually important for the purpose.</td><td>Fulfilment of the criteria is essential for the purpose.</td></tr>
<tr><td>Criteria 4: The indicator can be determined without calculations which require input assumptions.</td><td>Fulfilment of the criteria is beneficial but not always prioritised</td><td>Fulfilment of the criteria is beneficial and important for the purpose.</td><td>Fulfilment of the criteria is beneficial for the purpose and a question of quality.</td></tr>
<tr><td>General trade-offs to be avoided</td><td colspan="3"></td></tr>
<tr><td>Criteria 5: The complexity of the MRV is manageable.

Criteria 6: The indicator can be monitored with own information and data.</td><td colspan="3">Fulfilment of the criteria is up to the individual project but will result in lower costs.</td></tr>
</table>

Criteria 7: The indicator should relate to specific targets of the SDGs.	Fulfilment of the criteria is required to decrease risk of political sensitivity.
Criteria 8: The indicator directly relates to national legislation or international treaties.	Fulfilment of the criteria is beneficial for decreasing the risk of political sensitivity.

Source: Authors' own elaboration.

The criteria for effective indicators as summarised in

Table 10 were more systematically compared to the project-level impact indicators in the four shortlisted impact categories – *welfare, education, land* and *balance of payment*– to indicate the general status of existing indicators with regards to their ability to deliver on the objectives of sustainable development impact assessment. The evaluation indicates that fewer than half of the indicators would meet all of the identified criteria to be able to effectively deliver on all of the objectives. While almost all indicators are a quantitative metric, common issues with the indicators are that they often do not offer transparency on the cause and effect relationship, and that measurement often would require significant input assumptions.

The comparison of the indicators to the criteria shows similar results across the four impact categories. However, a few points are noteworthy. While the cause-and-effect relationship appears to be more direct in the impact category *land*, comparably more data from outside sources is needed to calculate these impacts. While the indicators in the categories *education* and *land* almost only include indicators with a specific outcome, approximately a third of indicators in the *welfare* and *balance of payment* categories are non-specific. From the indicators in the impact category *education*, many input assumptions are needed to calculate the project impacts, since it is difficult to measure the quality of education and to prove additionality, e.g. that someone would not have been enrolled elsewhere in a without-project scenario. The apparent difficulty to address *education* indicators without third-party data access may be a contributor to the situation that fewer indicators are available for *education* on the project level.

Another complexity that was observed in the evaluation of indicators from the four impact categories was that one can draw a distinction between indicators which are a "simple" measurement of one specific outcome (e.g. *number of women employed under the action*), and indicators which appear to be more "complex" in a way that they combine more than one measurement within one indicator, often combining both an assessment of the quantity and the quality of the outcome in one metric (e.g. *total number of people for whom access to, or quality of, education is expected to improve;* where the degree of *improvement* that qualifies under the indicator is a secondary measurement to the number of people). This difference between simple and complex indicators, and implications for how such indicators can be most effectively implemented, will be a topic of exploration in Section 5, and is a factor for the selection of indicators for further analysis in the next section.

4.4 Selection of indicators for further analysis

In this section, we select those project-level indicators that are taken forward for further analysis to Section 5. In order to select these, the indicators within each impact category are further broken down into sub-categories related to the type of thing they assess, for instance indicators that assess gender equality within the impact category *welfare*. In a second step, those indicators that perform poorly against the criteria of effective indicators are excluded from the shortlist.

We selected one to two types of indicators for each impact category and then two indicators per type: the objective is to be able to objectively compare simple and complex indicators for each type of impact, while ensuring that as many different types of indicators as possible could be covered by the analysis, in order to produce a broad perspective of results that cover as diverse a range of methodological considerations as possible. For the impact categories of *welfare*, *education* and *balance of payments*, the distinction between simple and complex indicators is proposed as the most methodologically interesting avenue for exploration.

For the impact category *land*, the categorisation of indicators did not produce the same clear division between simple and complex indicators. Rather, the selected indicators were proposed for further analysis on the basis of them offering alternative ways of assessing similar outcomes. Through the proposed indicators for *land*, lessons can be drawn in the analysis on whether there are advantages or disadvantages to developing indicators that focus on *absolute* or *proportional* improvements, and whether there are significant differences in the implications of indicators that deal with the issue of *avoiding* negative impacts as opposed to leading to *improvements* in the outcomes for the same issue.

Table 12 gives an overview of the shortlisted indicators, the impact category as well as the type of indicator.

Table 12: Proposed selection of project-level impact indicators

	Indicator	Method	SDG relation (target)
1	Number of women employed under the action	Simple - Equality	Gender Equality (5.5)
2	Number of women provided with access to modern technology and/or finance (e.g. microfinance, mobile phones etc.)	Complex - Equality	Gender Equality (5.b)
3	Investment in housing	Simple - Investment	Sustainable Cities (11.1), No Poverty (1.4)
4	Investment in green/resources - efficient buildings	Complex - Investment	Sustainable Cities (11.1)
5	Additional number of teachers/trainers trained	Simple - Training	Quality Education (4.c)
6	Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	Complex - Training	Quality Education (4.4)
7	Additional material composted	Absolute measurement (composting)	Sustainable Cities (11.6)
8	Percentage of municipal waste composted	Percentage compost	Sustainable Cities (11.6)
9	Avoided soil erosion	Avoidance concept (soil quality)	Life on Land (15.3)
10	Soil quality improvement	Improvement concept (soil quality)	Life on Land (15.3)
11	New capacity added – renewable energy	Simple – Renewable energy	Affordable and Clean Energy (7.2)
12	Reduction in fossil fuel imports	Complex– Renewable energy	Affordable and Clean Energy (7.2)

Source: Authors' own elaboration.

The indicators presented in Table 12 are taken forward for further evaluation to the analysis in the next phase of this research project. We do not consider these indicators fixed, but rather take them forward as interesting examples with the greatest learning potential. Based on the analysis in the next steps, we will suggest adapted indicators or tweaks to the indicators selected.

4.5 Summary of findings and implications for next steps

The Sustainable Development Goals (SDGs) are highly relevant as a framework for sustainable development impact assessment, but the official SDG indicators are only partially applicable to project-related activities. The breadth of the synergies between mitigation project activities and the achievement of the SDGs, along with the universal acceptance of the SDG as markers for sustainable development, make it highly appropriate to consider the impact towards SDG targets when defining indicators for sustainable development impact assessment at the project level. Depending on the project, some SDG indicators are directly applicable as project-level impact indicators (~4%), but most of the SDG indicators are relevant at the macro level and are either not applicable for measuring project-level impact or can only be used on the project-level through proxy indicators (~30%).

From the 217 relevant project-level indicators that were identified from the literature and existing programmes, most of these existing indicators exhibit a number of drawbacks that would prevent the indicators from being able to fully deliver on the full range of potential objectives for sustainable development impact assessment. Fewer than half of the indicators that are relevant to the impact categories *land*, *welfare*, *education* and *balance of payment* met all of the criteria that we identified for indicators to effectively meet the set objectives. In some cases, this may be by design since not all of the potential objectives are relevant for all programmes and purposes. Furthermore, developing indicators and approaches to meet all objectives can lead to higher resource expenditures and transaction costs for monitoring, reporting and verification.

Section 5 will build on these findings to explore a selection of the indicators in greater detail, developing effective solutions for their further refinement and implementation, in a way that they could deliver on all potential objectives for sustainable development impact assessment, while controlling for high transaction costs and political sensitivities.

5 Improved approaches for implementing sustainable development indicators

5.1 Overview of indicators and approaches considered

Indicators for the assessment of sustainable development impacts

Section 3 found that an approach that considers the quantitative assessment of specific individual impacts against a baseline has the most potential to deliver on the full range of purposes that sustainable development impact assessment might have – i.e. informational purposes only, labelling standards, or commodification and crediting. Since UNFCCC negotiators have not yet clarified the rationale of and provisions for sustainable development impact assessments in Article 6 of the Paris Agreement, this study looks into options for indicators that are flexible enough to deliver on all potential objectives and purposes, if required.

We identified a selection of indicators that allows for a quantitative assessment of specific individual impacts against a baseline. Since this is a complex and resource-intensive exercise for project developers and programme administrators, the analysis in Sections 5.2 and 5.3 focuses on pragmatic solutions and frameworks for monitoring, reporting and verification, which can ease the implementation process for developers and programme administrators.

The indicators which we identified through the shortlisting process in Section 4, are further explored in Sections 5.2 and 5.3. This list of 12 indicators is not exhaustive, but rather a demonstration of how indicators can be effectively implemented to meet the needs and objectives of sustainable development assessments while minimising costs and political sensitivities. All indicators on the list are designed to assess positive sustainable development impacts. In Section 6 we elaborate on measures and indicators used to operationalise safeguards against negative impacts.

In addition to discussing options for the implementation of these indicators, Section 5.3 also includes recommendations for replication of the process for developing indicators and how these indicators can be used in various contexts. The initial list provides 12 indicators with related specification, however, the findings of the analysis in the following sections leads us to propose some adjustments to some of the indicators to enhance their usability. A detailed overview of the analysis for each of the selected indicators is provided in Annex III.

5.2 Optimising the indicators specification to enhance MRV approaches

This section will analyse how indicators can be optimised, related in particular to the following implications for MRV approaches:

- Different levels of specificity in the definition of an indicator;
- Different degrees of complexity and multi-dimensionality of an indicator; and
- Different approaches for an indicator's expression: the language and type of formulation used to define and communicate an indicator.

5.2.1 Specificity in the definition of an indicator

Although all indicators in our selection refer to a specific impact rather than to an aggregation of multiple impact areas, some indicators are more precise than others. The vaguer an indicator is, the more it can lend itself to flexible interpretation. For instance, the indicator 1 *investment in housing* leaves room for interpretation if no exact definition and measurement procedures are

provided, as investment in housing can be expressed in different ways, for instance as the "direct investment in USD" but also in the "number of newly built houses". An indicator referring to units of homes built ("number of newly built houses") is a more specific and significant reference than the indicator related to investment in USD ("direct investment in USD"). While the metric "USD" appears easier to compare across borders, the economic dimension in certain country contexts should also be considered. Investment costs for buildings vary between regions and countries, as a result of material, energy and labour costs, and so on. Hence, the metric "number of houses newly built" may be more suitable for comparing and more meaningful than measuring the indicator "investment in housing" in USD.

The analysis of the selected indicators suggests that indicator specificity is one of the most important issues for monitoring and reporting, including for the ease of interpretation and policy relevance of the information that the indicator is designed to deliver.

Indicators need to be highly specific in order to be accurately measured and meaningful to their target group. Some programmes have been less specific in the definition of indicators, so project developers had the flexibility to define approaches that were most pragmatic in their projects' contexts. While ill-defined indicators may suffice for programmes that seek to provide *information only*, our analysis shows that such indicators are insufficient if the reported impacts should be comparable.

Numerous interpretations exist for the word "quality" in the indicator 10 *soil quality improvement*. These include the ability to yield a higher volume of crops; sequester carbon; maintain a healthy ecosystem; act as a habitat for biodiversity; cycle nutrients; support land stability; and support water management. Higher quality in some of these areas does not necessarily correspond to higher qualities in others; some may even be competing objectives. Similarly, depending on local context, the indicator 4 *investment in green/ resource–efficient buildings* can be – technically or economically - interpreted in different ways. To assist in the identification of measurement techniques and to avoid misinterpretations at the point of reporting and communicating the information, indicators must be defined more specifically.

The claim that less specific indicators may offer more flexibility is short-sighted. In fact, more specific indicators may lose their relevance in some contexts, but in those cases project developers have the option to use other, more relevant indicators instead. Flexibility in the definition of an indicator does not necessarily reduce the costs of the implementation process. On the contrary, the more clearly defined the indicator, the clearer the options for their measurement. From the perspective of programmes or standards, more specific indicators allow for a more efficient adherence to the guidelines for indicator implementation and processes for verification.

To achieve a suitable balance between pragmatism and transaction costs, a project developer should be flexible in the selection of MRV approaches. A well-defined and specific indicator can still include a variety of options to offer flexibility to project-specific circumstances. Box 3 gives a general overview of how flexibility is understood in the context of this study, while Section 5.3.1 elaborates on a concrete example.

Box 3: Flexibility on MRV

The Paris Agreement and its Rulebook on a common Enhanced Transparency Framework (common transparency and accounting rules) grants some flexibility to Parties that need it according to their capacity. The modalities, procedures and guidelines17 for the transparency framework for action and support referred to in Article 13 of the Paris Agreement specify the flexibility that is available to those developing country Parties that need it in the light of their capacities reflecting flexibility, including in the scope, frequency and level of detail of reporting, and in the scope of the review. The application of flexibility provided is to be self-determined.

For the sustainable development benefits and indicators, flexibility can be provided on different levels, when it comes to the transparency and MRV framework:

- Scope: Project proponents could be required to report on sustainable development indicators but are flexible in choosing the indicators from a given set of indicators. For instance, the project would need to report on three relevant indicators for its project type, which can be selected from a list of 20 predefined indicators.
- Frequency: With regard to the frequency of measuring and reporting, some flexibility could be granted, e.g. reporting every second year instead of annually. However, for sustainable development indicators frequent reporting is desirable to ensure a clear cause-and effect relation and should be aligned with the emission reduction reporting, which usually on an annual basis.
- Detail of measuring and reporting: The choice of the monitoring and reporting methodology could be made dependent on the options available within the project scope and the specific context. Depending on the assessment, some indicators require a higher certainty in the accuracy of information to be meaningful, while others may be determined by using approximation or are derived from default values. Flexibility can also be granted if insufficient data is available due to the absence or inefficiency of measurement results.
- Scope of the review: For the review process, flexibility can be provided with regards to the evaluation and can range from self-evaluation, to quality control (secondary party) to a structured verification with third party auditing. Depending on the use of the indicators, e.g. labelling or crediting, a stricter review may, however, be required (compare Section 4)

For the analysis on improved approaches for implementing sustainable development indicators in this section, flexibility mainly refers to the scope of reporting and the detail of measuring and reporting.

[17] Decision 18/CMA.1 on Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement in UNFCCC/PA/CMA/2018/3/Add.2

5.2.2 Complexity of dimensions within an indicator

Indicators can be categorised into two types with regard to the complexity:

- **One-dimensional (simple) indicators** are those which measure one single data point, for example indicator 1 *number of women employed under the action.*
- **Multi-dimensional (complex) indicators** measure multiple data points and combine them into a single expression. An example from the list of indicators in this study is the difference between indicator 3 *investment in housing* and indicator 4 *investment in green/resource-efficient buildings*. Here, indicator 4 requires the definition of "green/resource-efficient buildings" to be set and measured in addition to the size of the investment.

One-dimensional indicators are usually directly related to or the basis for multi-dimensional indicators. That means that multi-dimensional indicators can build upon or be derived from a related simple indicator through either aggregation or by introducing specific categories / criteria that need to be fulfilled (specification of indicators). Hence, multiple definitions and additional specification of the complex indicators are required, e.g. investments in housing in general expressed in USD (one-dimensional) or number of houses (one-dimensional) is an integral part of indicator 4. A multi-dimensional indicator could be *investment in green/resource-efficient buildings* where not only the investment variable is measured but also some reassurance that the houses have been built to certain energy efficiency or sustainability standards.

Both categories, one-dimensional as well as multi-dimensional, entail advantages and disadvantages:

One-dimensional (simple) indicators provide more distinct and comparable information and, in some cases, **reduce the complexity of monitoring and verification**, compared to multi-dimensional indicators:

> **Example:** Indicator 11 new capacity added – renewable energy and indicator 12 reduction in fossil fuel imports:
>
> In order to measure and report on the one-dimensional indicator 11 new capacity added – renewable energy the project developer can make use of its own operation data and information. This is easily compared between countries and project activities. It may however not describe and quantify what effect the renewable energy project has had on the energy security of the country. Yet, the data collected can serve as a basis to infer that information.
>
> In order to report on the multi-dimensional indicator 12 reduction in fossil fuel imports, information from other actors or on the national level is required, which increases the MRV efforts. This may relate more to the policy level in terms of trends affecting energy security, but although increased renewable energy capacity can reduce fossil fuel imports, many other factors may also be relevant such as international market prices for fossil fuels, or energy efficiency measures in the country, or supply disruptions. The cause and effect relationship of increased capacity in renewable energy in this case is weaker. The increased policy relevance comes with a trade off in the MRV effort and in a determination of a cause and effect relationship.

One-dimensional indicators may be difficult for some audiences to contextualise:

> **Example: Indicator 9** avoided soil erosion:

While the exact definition of a one-dimensional indicator offers consistent and exhaustive information about the issue analysed, such an indicator can be difficult to contextualise, and therefore lose its value in terms of its meaningfulness or policy relevance. A simple absolute measurement of the magnitude of total soil loss by soil erosion, measured as tonnes per hectare over the monitored area, may be understandable to the community of earth scientists, but other audiences may not be able to understand whether a reading might represent a high or low amount of erosion without more information about its scale or context.

However, the use of multi-dimensional indicators to provide context for policy relevance can also be politically sensitive:

Example: Indicator 4 investment in green/resources - efficient buildings:

The determination of the definition of additional dimensions can be politically sensitive, if internationally agreed definitions are not available and used. An example here is the minimum performance standard, e.g. in kWh/m²a, required to define an energy – efficient building.

On the other hand, the **multi-dimensional indicator may allow to identify a more verifiable sustainable benefit** than those that can be derived from simple indicators:

Example: Indicator 3 investment in housing and indicator 4 investment in green/resources - efficient buildings:

A more complex indicator such as reduced percentage of urban population living in slums, informal settlements or inadequate housing source can be indirectly seen as investments in housing but require much more information on the local context on quantity and quality of formal and informal housing units. This is an advantage of multi-dimensional indicators as they can provide more targeted and relevant information, but also may be politically sensitive – even in attempting to attain the data as they may highlight the extent of slum dwelling populations. In the case of indicator 3 investment in energy / resource efficient housing, the indicator is related to a quality and performance standard, which provides a higher significance and validity, but is also more complex to generate. Hence, the disadvantage of multi-complex indicators is in comparison to simple indicators that some requirements have to be defined and it needs to be proven that these are met, e.g. minimum performance standards for energy efficient houses. This makes the measurement of the indicator more cumbersome, since besides the sole number of houses also the quality and performance of those need to be determined and measured.

Multi-dimensional indicators may require more accurate measurement techniques for the information to be reliable. Error margins in simple absolute measurements are easy to understand and account for. However, in the case of categorical rather than absolute measurements – required when employing multi-dimensional indicators for all but one of the indicator's dimensions – normal error margins can lead to false measurements if the range of uncertainty pushes the reading into a different category.

Example: Indicator 9 *avoided soil erosion* and indicator 4 *investment in green/resources - efficient buildings*:

For example, if "severe soil erosion" is defined as the loss of more than 11 t/ha over the period of a year, then the soil erosion measurement technique with an error margin of 36-60 t/ha is too inaccurate to give a meaningful estimate of the proportion of the land considered to be exposed to severe soil erosion. In the same way, the number of new green

buildings is meaningless if the dimension green / energy efficiency is not measured as well. That means the project does not only measure the number of houses built but also the energy and resources consumed.

More sophisticated and accurate measurement techniques, needed to MRV multi-dimensional indicators, are usually associated with higher costs or are phasing **other barriers** such as data availability or confidentiality.

Example: Indicator 2 *number of women provided with access to modern technology and/or finance*:

For instance, to measure the indicator 2 *number of women provided with access to modern technology and/or finance (e.g. microfinance, mobile phones etc.)* personal data may be required or at least costumer information on information on bank account ownership and the beneficiary of a mobile phone contract.

Table 13: Comparison of pros and cons of one-dimensional and multi-dimensional indicators

Category	One-dimensional	Multi-dimensional
Comparability and consistency	Higher	Medium - Low
Completeness and transparency	Higher	Depending on context
Political relevance; ability to contextualise	Lower	Higher
Political sensitivity	Lower	Higher
Measurability and practicability for projects	Potentially less demanding	Potential more demanding
MRV cost and complexity	Potentially less demanding	Potential more demanding

Source: Authors' own elaboration, based on analysis above.

Based on the review of the advantages and disadvantages of each type of indicator, we draw the following conclusion:

The higher complexity of multi-dimensional indicators suggests that their use should be limited. In the case of approaches where sustainable development impacts are credited, comparability of information is essential and multi-dimensional indicators are not suitable, unless they are used and defined in a uniform way that allows for the comparison amongst different project and country contexts. For the indicator pairs analysed in this study we find that in most cases the one-dimensional indicator is more applicable.

Example: Indicator 5 *additional number of teachers/trainers* trained and indicator 6 *total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities*:

The one-dimensional indicator 5 *additional number of trainers trained* cannot provide a measure that is comparable between different project contexts, while the tweaked multi-dimensional indicator 6 *additional number of skilled workers trained and employed under the project activity* delivers on that objective.

For informational and labelling programmes, one-dimensional indicators are recommended wherever possible due to the superior comparability of the information they communicate and since they may leave the project participants with more flexible options for monitoring and

verification approaches, compared to complex expressions that are particularly sensitive to accuracy of measurements in order to be meaningful. Multi-dimensional indicators can provide more context to assist interpretation and policy relevance, but the provision of this context within the indicator requires definitions that can also be politically sensitive. That context can also be provided in isolation from the absolute indicator at the point of communication.

5.2.3 Type of expression used in an indicator

From the selected indicators, two distinctions are identified related to the type of expression in the indicator:

- **Absolute and proportional expressions**: Indicators 7 and 8 (*Composting*) assess a similar impact, with one being an absolute and one a proportional expression of the indicator.
- **Indicators that express avoidance versus those that express additional improvement**: most of the indicators used in the literature are expressed in terms of an "improvement" or an "addition" compared to a baseline. Some indicators are related to the concept of "avoidance" or "reduction" compared to a baseline. This is not to be confused with safeguards that secure against negative impacts of the project, since the indicators intend to measure the projects' positive impact on avoidance or reduction of an undesirable outcome that would have happened in the baseline, without the project. Indicators 9 and 10 (*Soil quality*) assess a very similar impact with one being an avoidance-based and one an improvement-based indicator.

For absolute and proportional indicators different approaches for the measurement and determination of the indicator value are required. While for absolute indicators, the data can usually be sourced by the project directly, the proportional expression needs a comparative value. For instance, the indicator 8 *percentage of municipal waste composted* is multi-dimensional and proportional expressed. Hence, to determine the indicator value in the baseline and in future, the total amount of municipal waste needs to be known. Depending on the project boundary these amounts may be related to the project, the city, region or country the project is implemented in meaning that the scope of the sustainable development impact MRV may need to be much larger than the geographical scope of the project itself. Hence, the proportional indicator can only be reported on project level if aggregated numbers for the region or country level are available. The choice of measuring has also implications for determining the baseline under the absolute or proportional expression. For instance, the baseline for direct measuring of specific, absolute numbers should reflect the situation before the implementation of the project; in many project cases this baseline is zero. Alternatively, the baseline for indirect measuring of aggregated, proportional indicators should consider the development of the indicator without the project and express both, the total development of the figure and the additional part stemming from the project, if possible. The share of municipal waste composted, for example, could be reflected in the baseline (for instance 5% without the project and 15% after project implementation). But again, for the proportional expression a comparative figure or benchmark is necessary, which is to be sourced from historical data and national or international statistics, as the project itself cannot account for aggregated data.

For indicators addressing *avoidance* and *improvement*, there is no significant difference between approaches for monitoring and reporting for these different expressions, if they are presenting the same trend and the same impacts. Both expressions could be phrased more neutrally as a "change", in order to make them equally as appropriate for a wide range of applications, including monitoring for safeguard principles. However, the expressions

"avoidance of potential negative trend" and "improvement of a trend" may be easier to interpret and more policy relevant than neutral expressions, and it makes no significant difference to the monitoring and reporting approaches where the data point collected remains the same neutral indicator of state.

***Avoidance* and *improvement* indicators need to be compared to the historical development or a baseline scenario.** The "change" measured by an indicator always depends on the historical development and a defined target to be reached, or take into account a baseline scenario and specific developments considered herein (e.g. business as usual development, dynamic use and penetration of technologies, consumption patterns, efficiency standards etc.). The deployment does not necessarily reflect the business-as-usual (BAU) situation, and if so the set target for the indicator should be more efficient on the project level. Baselines can be projected to be stable, increase or decrease subject to the underlying development of the indicator. For example, in case investment in efficient buildings shall replace or avoid the future use of conventional fossil fuel energy sources, in the baseline scenario without the project, the use of fossil fuel may continue to prevail or could decrease due to affordability and economic development related to renewable energies. In other cases, where, for instance, no regulatory framework for waste management exists, the baseline scenario could rather be a business-as-usual development and hence no waste would be composted, if no project will take place. The indicator should measure the change compared to this baseline. The avoidance and improvement dimension of indicators can also be used to set actual target to be achieved by a project.

5.3 Success factors for effective implementation

A strong monitoring, reporting and verification (MRV) system for the assessment of sustainable development impacts requires robust determination of the respective set of indicators, the use of appropriated measuring devices, and a clear management process for data monitoring, reporting and verification. Each of these elements could potentially represent a challenge for the implementation of the MRV framework. Based on the lessons learned from the elaboration of MRV procedures for the selected indicators, this section will reflect on some of the success factors that can overcome persisting barriers that prevent effective implementation.

While section 3.2.2 identified that the objectives of sustainable development impact assessment require a structured approach to monitoring, reporting and verification, rigid requirements can lead to a number of barriers, as shown in Table 14.

Table 14: Barriers arising from rigid requirements in monitoring and reporting

Barrier	Explanation	Success factors to overcame barrier
Financial barriers	More sophisticated monitoring and verification are often more costly to implement, resulting either in the activity not being measured and the indicator not used, the activity being incorrectly measured as a result of not being able to follow the approach thoroughly, or the transaction costs increasing as a result of employing the monitoring and verification requirements correctly.	▪ Provision of flexibility in approaches to monitoring and verification ▪ Dedication of clear responsibilities ▪ Capacity building and training

	The ability and necessity of a project to adopt sophisticated approaches and absorb transaction costs will vary between projects and programme approaches.	
Technical barriers	Some measurements may not be technically feasible, if for example, required equipment is not available, if the approach is not common practice in a specific area or country, or if the approach requires third party data that is not routinely collected in the region of the project. This is the case not only for project participants at the monitoring phase but also for local verifiers.	▪ Provision of flexibility in approaches to monitoring and verification ▪ Link to internationally accepted benchmarks and best practice ▪ Use of reliable and accessible data sources
Political barriers	Political sensitivities could exist if defined approaches conflict with alternative approaches that are traditionally used in a specific area or country.	▪ Link to internationally accepted benchmarks and best practice ▪ Dedication of clear responsibilities ▪ Capacity building and training

5.3.1 Provision of flexibility in approaches to monitoring and verification

Structured approaches to monitoring and verification can still include several flexibilities to adapt to specific contexts and capacities.

For example, multiple methods could be applied to monitor the indicator of soil erosion. All of the methods below are relatively uncomplicated in practice, but differ in terms of the equipment required and the suitability for their local context:

- Measurements of soil height against erosion stakes (very easy to monitor, but high uncertainty range of 36-60 t/Ha)
- Contour plotting frames (high accuracy though only suitable for very small land areas; perhaps suitable for micro-scale agriculture and land use management).
- Runoff plots where collectors are stationed at artificial boundaries to physically monitor the volume of soil run-off (high accuracy though only suitable for cultivated fields)
- Mesh bags can be used to measure changes in the distribution of soil across a field (the accuracy of the approach is uncertain, though trials show correlation to the results from other approaches such as run-off plots (Hsieh, Grant, & Bugna, 2009)).

The selection of methods for monitoring and verification can be made depending on the options available within the specific context and the purpose of the assessment. For some applications that require a higher certainty in the accuracy of information, some methods may be unsuitable, but it is usually possible to provide some flexibility by offering several approaches that provide a

reliable indicator of a trend and a scale of order magnitude, which is arguably sufficient for most purposes of sustainable development impact assessment. However, to allow for full comparability of projects on the same indicator the measuring needs to be accurate and at the same level (e.g. for crediting purposes).

Flexibility can also be granted if insufficient data is available due to the absence or inefficiency of measurement results or data, e.g. due to a mission weighting monitoring system. Here temporary national or international default values could be used (in a tier preference), at least in the beginning and when an ex-ante estimation of the impact is done. Once the MRV system is implemented the calculations should be updated with measured values.

5.3.2 Link to internationally accepted benchmarks and best practice

Data sources or international standards may be required as a reference when multi-dimensional indicators are defined. For instance, the definition of standards / requirements of minimum living standards might be different across countries, which will possibly reduce the comparability. In case of "proper" housing, international standards and definitions for proper living can be used as minimum standards if national standards are not defined and available. Another example are energy performance standards and levels which may be not available for each country (relevant for multi-dimensional indicators). In this case samples or national / international default values can be used as a proximation.

5.3.3 Reliable and accessible data sources

Statistics are relevant for both input values and for cross-checking of results. If data is not available, a tiered approach should be followed: If local data is not available, national data should be used. If national data is not available, international data or default values should be used. The source and justification should be documented. Unreliable or missing aggregated data can be a major barrier, such as in the case of the indicator 2 *number of women provided with access to modern technology and/or finance (e.g. microfinance, mobile phones etc.)*, as numbers on employment rates, financial account ownership and mobile operator contracts may be not available. Through collaboration with international verifiers organisations collecting such data could be supported to improve geographical coverage or indicator coverage. The verifier could also help to ensure quality control through site visits and interviews with stakeholders.

5.3.4 Dedication of clear responsibilities

If the design of the MRV system does not provide clear responsibilities for each actor involved (e.g. waste collection, compost processing etc. for indicator 7 *additional material composted*), there is a risk that the implementation of the system will not be successful. The establishment of a management framework for the MRV system at the institutional and organisational level is essential for the successful implementation and the continuation of the MRV operations. The monitoring and the MRV system should be considered at all stages of the project cycle, i.e. the design, implementation and operation phase. This will ensure the MRV is well integrated into the overall project implementation.

5.3.5 Capacity building and training

Capacity building and training for staff / project proponents is essential to ensure adequate MRV. To assure the quality of data handling, training should be provided to monitoring personnel in line with the individual MRV design of the project. The project proponent should provide its staff with all necessary information and training material that enables the responsible person to conduct the monitoring process as required by the MRV design. The MRV

procedures for each project should outline the institutional set-up and responsibilities, in particular with regards to data recording, reporting and verification (data quality control). This should include information on necessary skills and competencies to implement the procedures and propose any training required to enable the personnel to fulfil the tasks.

5.3.6 Overview of monitoring and reporting options for the selected indicators

Table 15 summarises the proposed optimised monitoring option for the 12 indicators. Based on the analysis above and through the proposed MRV options for each indicator that are presented in more detail in Annex III, we identified general recommendations and success factors. Full details of the proposed implementation options for each indicator are presented in separated dedicated tables for each indicator in Annex III. Each of these indicator tables includes full details of the proposed approach for monitoring, reporting and verification.

Table 15: Optimised monitoring options for the shortlisted indicators

	Welfare		Welfare		Education	
	Simple - Investment	**Complex - Investment**	**Simple - Investment**	**Complex - Investment**	**Simple - Investment**	**Complex - Investment**
Indicator	**Number of housing units n_y**	**Number of housing units in green/resources - efficient buildings**	**Number of women employed under the action**	**Number of women provided with access to modern technology and/or finance (e.g. microfinance, mobile phones etc.)**	**Additional number of teachers/trainers trained**	**Additional number of skilled workers trained and employed under the project activity**
Data Unit	Number of housing units per year (No.)	Number of housing units per year (No.)	Number of jobs for women generated by the project (No./year)	Number of women who have an account at various financial institutions / own a mobile phone (No./year)	-	Number of full-time equivalent skilled workers who were trained
Description	Number of adequate, safe and affordable housing units built with new investments per year	Number of in green/resources - efficient housing units built with new investments per year fulfilling minimum energy / resource efficiency standards.	Increasing the number of women having a job. Employment promotion of women enhance women's economic empowerment	Increasing the number of women who have access to modern technologies in order to enhance women's economic empowerment	In general, the indicator is not applicable/ realistic in a project scenario.	Skilled labour refers to labour that requires workers who have specialized training or a learned skill set to perform the work.
SDG relation (target)	SDG Target 11.1: Safe and affordable housing		SDG target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life		SDG 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	
Measurement procedures and source of data	*Direct measuring (specific, absolute, improvement)*: Number of housing units are measured directly by the project according to project records, balance sheet or as per annual report.		*Direct measuring* (specific, absolute, improvement): Number of women employed due to project activities are measured directly by the project:	*Direct measuring* (specific, absolute, improvement): Number of women employed due to project activities are measured directly by the project:		*Direct measuring* (specific, absolute, improvement): Employment data base of the project and official documentation from staff trainings.

	• Number of new houses built as a direct consequence of the project In order to specify efficiency standards an energy performance benchmark based on whole-house energy performance should be defined	• Number of created jobs for women as per company staff records or balance sheet	• Number of created jobs for women as per company staff records or balance sheet		
Monitoring frequency	Annually reporting of measured / recorded values. To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and continuously operated throughout the lifetime of the project	Data collection and reporting is based on an annual basis. Monitoring and evaluation processes involve both women and men data.			Annual reporting of measured values. To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and be continuously operated throughout the lifetime of the project.

	Land		**Land**		**Balance of Payment**	
	Simple – Investment	**Complex - Investment**	**Simple - Investment**	**Complex - Investment**	**Simple - Investment**	**Complex - Investment**
Indicator	**Additional material composted**	**Percentage of municipal waste composted**	**1. Magnitude of soil erosion / 2. Area affected by severe soil erosion**	**Soil stability**	**New capacity added – renewable energy**	**Reduction in fossil fuel imports**
Data Unit	Total quantity of waste composted at the facility (tonnes per month/year)	Total quantity of municipal waste composted (tonnes per month/year)	1. Magnitude of total soil loss by soil erosion (t / Ha) *And* 2. Area affected by soil severe erosion (km2 or % of defined region) (severe erosion defined as >11 t ha-1 yr-1t/Ha)	Aggregate stability of soil (% of soil with aggregates > 0.25mm)	MW of new capacity added	MWh produced Value of imported fossil fuel avoided (USD)

Description	The amount of waste treated aerobically such as composting and proper soil application of the compost to treat biomass or other organic matter in a controlled biological way.	The percentage of municipal waste treated aerobically such as composting and proper soil application of the compost to treat biomass or other organic matter in a controlled biological way.	Soil erosion is the physical loss of soil from an area by wind, water or other means. Land management practices may help to avoid soil erosion. 1. Mass of soil that is lost per hectare of land over a period of time. 2. Extent of the area of land (either expressed in absolute terms in hectares or as a % of the study area)	Soil aggregates are groups of soil particles that bind to each other more strongly than to adjacent particles. Aggregate stability refers to the ability of soil aggregates to resist disintegration when disruptive forces associated with tillage and water or wind erosion are applied. The indicator shows the proportion of soil which contains aggregates of soil particles that are greater than 0.25mm.	New capacity of renewable energy added under the project activities Renewable energy is defined as energy generated from natural resources which are either available with no time limit or replenish more quickly than the rate at which they are consumed, including bioenergy, geothermal, hydropower, marine, solar and wind energy.	Reduction in fossil fuel imports linked to the project
SDG relation (target)	SDG Target 11.6: Reduce the environmental impact of cities		SDG Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.		SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix	
Measurement procedures and source of data	*Direct measuring* (specific, absolute, improvement): Additional composting caused by project activities are measured directly by the project: • Treated waste in tonnes by using a weighbridge or any other applicable and calibrated weighing device, e.g. belt-scales • Weighting of waste delivered into the composting facility using the carrying capacity/weight of each truck (in tonnes) or belt delivering waste to the composting installation in year y. Measuring each truck with help of an weight or take random samples of		*Direct measuring* (specific, absolute, improvement): Several measurement options are available and any one of them could be used depending on the means most easily available to the project operator.	*Direct measuring* (specific, absolute, improvement): Reliable data at the project level can only be achieved through soil sampling techniques on-site (sampling techniques require only very basic specialised measurement equipment)	*Direct measuring* (specific, absolute, improvement): New renewable energy capacity added • MW of renewable energy capacity added	*Direct measuring* (specific, absolute, improvement): Reduction in fossil fuel imports • MWh generated by added renewable energy capacity • assumption on the rate at which RE generation offsets the need for fossil fuel imports • Cost of fossil fuel imports

	trucks to determine the average load carried				• Value of imported fossil fuel avoided (USD)
Monitoring frequency	On site-measurement: Continuous data collection is carried out through truck or belt weighting every time new material enters or leaves the facility. Reporting is performed on a daily and monthly basis with aggregation for annual reporting. In the case of an existing composting plant, an inventory is carried out before the start of the project.	Monitoring is required on at least a monthly basis to achieve a reliable annual average that is not over sensitive to fluctuations attributed to individual weather events.		Monitoring required on a monthly basis. To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and continuously operated throughout the lifetime of the project.	

5.4 Summary of findings and recommendations for optimising indicators

The following recommendations can be made for the formulation of indicators in a way that facilitates effective implementation, without necessarily increasing the complexity of the assessment approach.

- **Indicator definitions should be specific enough to ensure that there cannot be multiple interpretations of 'the indicator'**. With regard to monitoring and verification, a specific definition offers more clarity on the different measurement and verification approaches available, with efficiency gains from replication at a greater scale. At the point of reporting and communication, specific definitions ensure comparability and avoid misinterpretation. Specific indicator definitions do not compromise flexibility for the project developer since there can still be flexibility in the available approaches for monitoring, and project developers can still be free to select and use other indicators that are more appropriate to their context.

- **One-dimensional indicators should be used whenever possible to ensure comparability and reduce costs**. Multi-dimensional indicators provide incomplete data that can hide information, obscure cause and effect relationships, and lead to misinterpretations. When sustainable development impacts are credited, however, comparability of information is essential, so multi-dimensional indicators are not suitable. Further, multi-dimensional indicators can require additional processes for monitoring and reporting including on a larger geographic scope, which may require a higher level of accuracy than the processes for one-dimensional indicators in order to be meaningful. Multi-dimensional indicators can provide more context and increase policy relevance. However, the provision of this context requires additional definitions within the indicator that can be politically sensitive.

- **Indicators should be expressed in absolute terms.** Absolute figures are required to report the impact of the activity on project level. Reporting on proportional indicators can only be applied on project level if aggregated numbers for the region or country level are available, this will complicate the MRV for the project developer. Absolute figures will further increase the comparability and ease the verification.

After analysing the selected indicators, we identified the following five success factors to overcome barriers hindering indicators' implementation:

1. Structured approaches to monitoring and verification should include various **flexibilities** which allow adapting to specific contexts and capacities. It is usually possible to offer a flexible range of approaches, which provide a reliable indicator of a trend and a scale of order magnitude, sufficient for most purposes of sustainable development impact assessment.
2. In order to reduce disproportional efforts and transaction cost for the project proponent the measuring of the indicators should **allow the use of national and international default values and standards**, where measured figures are not available (or only with comparatively unreasonable efforts). This should be done in a tiered approach as appropriate.
3. **Reliable and accessible data sources** are crucial for the successful implementation of indicators. The source and justification of all data should be documented. Collaboration with

international verifier organisations can help overcoming problems with unreliable or missing data**.**

4. MRV systems need to include a management framework at the institutional and organisational level that **provides clear responsibilities for each actor.** This reduces the risk of unsuccessful implementation.
5. **Capacity building and training for staff** is essential to ensure an adequate MRV implementation. To ensure the quality of the assessment, the project proponent should provide its staff with all necessary information and training in line with the individual MRV design of the project.

Full details for potential approaches for optimising the specific selected indicators in this analysis are provided in Annex III.

6 Safeguarding against negative impacts

While the assessment approach for the demonstration of positive sustainable development impacts should be determined based on the objectives of the specific programme, the analysis also showed that regardless of the approach taken, it is of key importance that this is complemented by stringent safeguards against potential negative impacts on progress towards the sustainable development goals, or human rights more generally. Accordingly, in this section we perform a brief analysis of the approaches adopted by different programmes for safeguarding against negative impacts and consider the potential role of indicators for that purpose.

While a universal definition of safeguards does not exist, for the purposes of this report, we identify safeguards as principles, rules, and procedures that (1) ensure that projects anticipate potential adverse impacts on the local environment and communities; (2) avoid such impacts, or (3) where these impacts are unavoidable, minimise the adverse effects (based on GEF, 2019).

Whereas project developers can select a small number of indicators to prove their project has sustainable development co-benefits, avoidance of negative impacts requires that project developers screen and mitigate the full spectrum of possible adverse consequences. Although all institutions and programmes we reviewed have safeguarding principles in place, their approaches to safeguards vary. In this section, we undertake a comparative analysis of different approaches to provide an initial overview of best practices and assess what role indicators can play in safeguarding principles.

We first discuss the relevance of safeguards for market mechanisms. We then turn to processes for safeguarding principles' implementation. Lastly, we consider the role of indicators, taking the safeguarding principles 'labour rights', 'gender equality and women's rights', and 'land and soil conservation' as examples.

6.1 The relevance of safeguards

A lack of detailed safeguards can lead to the implementation and registration of projects that have negative impacts on the environment and local communities and sometimes result in severe human rights violations, including the right to life, health, safety and physical and psychological integrity (Perez, Hofbauer, Mayrhofer, & Calzadilla, 2016).

While quantitative assessment of negative project impacts was not systematically carried out in the Clean Development Mechanism, a number of individual projects have made international newspaper headlines and drawn critique from local and international civil society, due to human rights violations and incitement of community conflicts, among other issues (see e.g. Perez et al., 2016) (Schade & Obergassel, 2014) (Obergassel et al., 2017). The establishment of safeguards against negative impacts remain a politically sensitive issue under market mechanisms and Parties and stakeholders have different views on the role of safeguards for Article 6 instruments. The high-level guidance for REDD+ related activities included in the Cancun Agreement included a number of safeguards for forest and land related projects, which achieved broad consensus and therefore often serve as a starting point for other programmes (Schneider et al., 2018). However, the interrelation between REDD+ and Article 6 of the Paris Agreement remain unclear, and countries and stakeholders do not widely agree on the minimum safeguarding criteria that should be included in the rules for Article 6 mechanisms more generally (Verles, Braden, Taibi, & Olsen, 2018).

We reviewed eight offsetting programmes, listed in table 16, to identify what role safeguards play in those programmes. We identified three broad categories of safeguards:

1. **Social safeguards** covering issues that influence the wellbeing of project stakeholders who are affected either with the project directly or indirectly through its activities;
2. **Environmental safeguards** that cover issues related to localised and transboundary environmental damage and biodiversity conservation; and
3. **Governance and procedural safeguards** that ensure the project complies with applicable legislation; that affected individual and communities are involved in decision-making processes; and that grievance mechanisms are in place to address (perceived) negative impacts.

While all programmes that we reviewed include these three overarching categories, important differences exist with regard to their interpretation of the principles and the level of detail. Further, implementation stringency varies among different frameworks (Schneider et al., 2018). Table 16 provides an overview of common safeguarding principles that we identified and to what extent existing programmes implement these principles. Generally, programmes define principles around the themes 'human rights', 'gender equality', 'cultural heritage', 'biodiversity', and 'transparency and disclosure'. All the standards and programmes that we reviewed had in place processes for checking compliance with safeguards both ex-ante and ex-post.

Table 16: Common safeguarding principles for existing programmes and funds

	CDM	Gold Standard[18]	Verra VISta[19]	REDD+ (Cancun safeguards)[20]	Adaptation Fund[21]	International Finance Corporation[22]	UNDP[23]	Green Climate Fund[24]
Social safeguards								
Human rights	-	X	-	-	X	X	X	X
Gender equality and women's rights	-	X	(X)	-	X	(X)	X	(X)
Labour rights	-	X	X	-	X	X	X	X
Corruption	-	X	X	X (2a, 2b)	-	-	-	X
Cultural heritage	-	X		X (2d)	X	X	X	X
Indigenous peoples' rights	-	X	X	X (2c, 2d)	X	(X)	X	X
Land acquisition, displacement, and involuntary resettlement	-	X	X	-	X	X	X	(X)
Public health and safety	-	X	-	-	X	X	X	-
Environmental safeguards								

18 The following link leads to the Internet: https://globalgoals.goldstandard.org/100-gs4gg-safeguarding-principles-requirements/

19 The following link leads to the Internet: http://verra.org/wp-content/uploads/2018/06/SD-VISta-Program-Guide-v0.1.pdf

20 The following link leads to the Internet: https://unfccc.int/resource/docs/2010/cop16/eng/07a01.pdf

21 The following link leads to the Internet: https://www.adaptation-fund.org/wp-content/uploads/2015/09/Environmental-Social-Policy-approved-Nov2013.pdf

22 The following link leads to the Internet: https://www.ifc.org/wps/wcm/connect/24e6bfc3-5de3-444d-be9b-226188c95454/PS_English_2012_Full-Document.pdf?MOD=AJPERES&CVID=jkV-X6h

23 The following link leads to the Internet: https://www.undp.org/content/undp/en/home/librarypage/operations1/undp-social-and-environmental-standards.html

24 The following link leads to the Internet: https://www.greenclimate.fund/documents/20182/574763/GCF_policy_-_Environmental_and_Social_Policy.pdf/aa092a12-2775-4813-a009-6e6564bad87c

	CDM	Gold Standard[18]	Verra VISta[19]	REDD+ (Cancun safeguards)[20]	Adaptation Fund[21]	International Finance Corporation[22]	UNDP[23]	Green Climate Fund[24]
Pollution prevention and resource efficiency	-	X	-	X (2e)	X	X	X	X
Protection of natural habitats	-	X	-	-	X	X	X	X
Biodiversity conservation	-	X	-	X (2)	X	X	X	X
Sustainable natural resource management	-	X	-	-	-	X	X	X
Transboundary risks and impacts	-	X	-	-	-	(X)	X	(X)
Climate change mitigation	-	X	-	X	X	-	(X)	X
Land and soil conservation	-	X	-	-	X	-	-	-
Governance and procedural safeguards								
Compliance with law and obligations	-	X	X	X (2a)	X	X	X	X
Stakeholder engagement and feedback processes	X	X	X	X (2d)	X	X	X	X
Grievance mechanisms	-	X	X	-	X	X	X	X
Transparency and disclosure	-	X	X	(X)	X	(X)	X	X

6.2 Processes for implementation of safeguards

Safeguarding against adverse impacts consists of two steps:

1. Identifying risks associated with the proposed project; and
2. Minimising or avoiding potential negative consequences.

Having clear rules for project developers to identify potential risks of an activity is a key first step for minimising and managing those risks.

Most reviewed programmes require project developers to identify risks at the project outset. The Gold Standard (2018c) for instance, requires potential project developers to submit a 'Safeguarding Principles Assessment' (see Box 4 for further details). SD VISta requires project developers to include one or more causal chains that describe the project's effects on 'people and their prosperity' and/or on the 'planet' in the project design document. These causal chains must include all direct positive and negative impacts. Indirect consequences may be included but are not required.

Common measures to identify risks include conducting Environmental and Socio-Economic Impact Assessments (EIA and SEIA, respectively) and seeking stakeholder engagement:

- **Environmental and Socio-Economic Impact Assessments**: Environmental Impact Assessments (EIAs) and Socio-economic Impact Assessments (SEIA) are commonly used tools for predicting as well as mitigating negative impacts of projects. While some programmes define their own requirements (e.g. Gold Standard, Verra SD VISta), others refer to requirements under national law (e.g. REDD+, MAAP) which may lead to uneven outcomes in different countries.

- **Stakeholder engagement**: Stakeholder engagement during project design and implementation is necessary to identify risks and vet proposed risk mitigation measures. Relevant stakeholders include communities in the proximity of the project, local governments, and civil society. The reviewed programmes commonly call for local consultations and a global public comment period to facilitate stakeholder engagement during project design. In addition, it is important that project developers define clear channels for stakeholder engagement and feedback during project execution. Such continuous engagement can go a long way in increasing the credibility of safeguard implementation.

To minimise or avoid the potential negative consequences identified, programmes commonly employ grievance mechanisms, as well as the use of indicators and MRV:

- **Grievance mechanism:** A mechanism for receiving and addressing complaints from stakeholders regarding harms and conflicts that arise from the project is an important institutional tool for safeguarding against impacts during a project's operations. While grievance mechanisms at the programme level are important as a measure of last resort, these mechanisms are often not accessible for certain types of stakeholders (e.g. local populations who are not aware of their rights or who do not have the means to reach out to an international body). For this reason, project level grievance mechanisms should be established, in addition to mechanisms at the programme level.

- **Use of indicators:** Indicators are sometimes used to gauge the implementation of some safeguarding principles. An indicator can dictate the kind of evidence towards the project's approach to mitigate a risk (e.g. distribution of home water treatment units in the community to avoid the risk of waterborne diseases such as cholera, typhoid) *or* to show how the project implements a safeguard (e.g. record of men and women employed as a measure to promotes equal opportunity). However, pre-defined indicators alone cannot control for all safeguarding principles, since negative impacts do not only affect a series of pre-defined conditions, but rather approaches are needed to address any number of potential negative impacts which may arise unexpectedly.
- **MRV requirements:** Some programmes require projects to include information on how social and environmental safeguards are implemented in their regular MRV. Both Gold Standard and Verra SD VISta require project developers to have monitoring plans. These include monitoring variables for the identified risk mitigation measures and include implementation of safeguarding principles, as well as the measurement approach for identified indicators and the frequency of monitoring. Monitoring reports should provide updates on the status of implementation and success of risk mitigation measures, and are required include supporting evidence (Gold Standard, 2018b; Verra, 2019c). Gold Standard requires monitoring reports to be verified by approved auditors.

Box 4: Safeguarding approaches
Gold Standard's principle *gender equality and women's rights*

Gold Standard's principle gender equality and women's rights recognises and seeks to contribute to SDG 5, which is to achieve gender equality and empower all women and girls. The principle spells out that Gold Standard does not certify projects that contribute to discrimination against women or reinforce gender-based discrimination and/or inequalities. Project developers should meet four mandatory requirements to comply with this principle (Gold Standard, 2018c):

1. The project shall complete the following gender assessment questions in order to inform requirements 2-4 (below):
   a. Is there a possibility that the project might reduce or put at risk women's access to or control of resources, entitlements and benefits?
2. Is there a possibility that the project can adversely affect men and women in marginalised or vulnerable communities (e.g. potential increased burden on women or social isolation of men)?
3. Is there a possibility that the project might not take into account gender roles and the abilities of women or men to participate in the decisions/designs of the project's activities (such as lack of time, childcare duties, low literacy or educational levels, or societal discrimination)?
4. Does the project consider gender roles and the abilities of women or men to benefit from the project's activities (e.g. do the project criteria ensure that it includes minority groups or landless peoples)?
5. Does the project design contribute to an increase in women's workload that adds to their care responsibilities or that prevents them from engaging in other activities?

6. Would the project potentially reproduce or further deepen discrimination against women based on gender, for instance, regarding their full participation in design and implementation or access to opportunities and benefits?
7. Would the project potentially limit women's ability to use, develop and protect natural resources, considering different roles and priorities of women and men in accessing and managing environmental goods and services?
8. Is there a likelihood that the proposed project would expose women and girls to further risks or hazards?
9. The project shall not directly or indirectly lead or contribute to adverse impacts on gender equality and/or the situation of women.
10. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work.
11. The project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks.

To demonstrate compliance with these four mandatory requirements, project developers need to use various safeguarding approaches. These could include stakeholder consultations and impact assessment for mandatory requirement 1; reporting and providing documentary proof for mandatory requirements 2 and 4; and using monitorable indicators for mandatory requirement 3. Gold Standard's gender policy requires project developers to engage in "gender sensitive stakeholder consultations", but project developers are free to use also other approaches to demonstrate compliance with the mandatory requirements.

6.3 Using indicators for safeguarding principles

In the previous section, we found that some programmes make use of indicators to assess the implementation of safeguards and to monitor against identified risks. Pre-defined indicators alone cannot control for all safeguarding principles, since negative impacts do not only affect a series of pre-defined conditions, but indicators may play a useful role for monitoring the status of specific risks which are identified to be especially relevant for the project activity.

This section illustrates how and what kind of indicators may be used for *labour rights*, *gender equality and women's rights*, and *land and soil conservation*. The proposed indicators are not meant be a comprehensive and exhaustive list, that should be employed in full for each project, but to give an exemplary overview over possible indicators, that can help assessing the respective safeguarding principle.

Labour rights

The safeguarding principle 'labour rights' encompasses the workers' right to decent employment, the minimisation of risks to health and safety in the workplace, and the avoidance of forced and child labour. This directly relates to SDG 8: "promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all". Although not possible for all of the SDG 8 targets and indicators, Table 17 shows that some targets and their respective indicators can directly be related to the project level.

Table 17: SDG 8 targets and indicators

SDG8: Decent work and economic growth

Target	Indicator
8.7: Take immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	8.7.1: Proportion and number of children aged 5-17 years engaged in child labour, by sex and age
8.8: Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	8.8.1: Frequency rates of fatal and non-fatal occupational injuries, by sex and migrant status
	8.8.2: Increase in national compliance of labour rights (freedom of association and collective bargaining) based on International Labour Organization (ILO) textual sources and national legislation, by sex and migrant status

Though they do not always explicitly refer to specific indicators, the programmes that we have reviewed require proof that projects respect workers' rights. Proof can be provided for instance by submitting documentation of working agreements; setting requirements for occupational risk prevention and reduction; and organising worker trainings aimed at local skill development.

SDG indicator 8.8.2 specifically refers to the International Labour Organization (ILO), the specialised UN agency for labour. The ILO has eight legally binding treaties on labour rights, covering issues such as freedom of association, forced labour, and child labour. Currently, 145 of the 187 ILO Member States have ratified all eight conventions[25], which reflects widespread acceptance of the ILO's norms. Indeed, most reviewed programmes require project developers to adhere to the rules prescribed by the ILO treaties.

Table 18 includes an overview of indicators that could be used to monitor issues related to labour rights, in line with the ILO groups of indicators (Anker, Chernyshev, Egger, Mehran, & Ritter, 2002).

Table 18: Potential indicators to monitor labour rights

ILO groups of indicators	Exemplary indicators
Employment opportunities	• Not reducing the number of overall jobs
Unacceptable work	• Child labour; ○ Use of age verification measures • Forced labour
Adequate earnings and productive work	• Minimum wages that provide income levels over the subsistence level; and • Guaranteed employee training opportunities
Decent hours	• Working hour limits (maximum number of working hours per week); • Provisions for compensation for overtime; and • Paid annual leave
Stability and security of work	• Type of employment generated by the project (permanent or contractual/daily wage);

25The following link leads to the Internet: https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:10011:::NO:10011:P10011_DISPLAY_BY,P10011_CONVENTION_TYPE_CODE:1,F

	• Duration of the generated jobs (permanent or temporary); and • Policies on terminations, including provisions on voluntary resignation by employees
Balancing work and family life	• Provisions for annual leave; and • Parental leave provisions
Fair treatment in employment	• Disclosure of jobs per gender, race, ethnicity, disabled, vulnerable communities etc. Where relevant; • Quota for female employees in senior and middle management; and • Limited salary band wages per employment level (gender wage gap)
Safe work	• Identification and documentation of potential hazards and measures for emergency preparedness; • Documentation of accidents and injuries, segregated by fatal and nonfatal injuries; • Occupational safety training for workers in the last year; and • Workplace safety checks by an independent auditor
Social protection	• Provision of employee health insurance, pension schemes, etc.
Social dialogue and workplace relations	• Existence of labour associations/workers' council; and • Opportunities and set procedures for arbitration

Gender equality and women's rights

Of the eight programmes we reviewed, only three very explicitly state that projects shall not counteract gender equality and women's rights: Gold Standard for Global Goals, the Adaptation Fund, and UNDP. Three others require projects to safeguard against negative impacts on women, while neither the CDM nor the Cancun Safeguards include gender equality or women's rights as a safeguarding principle (Table 16).

Table 19 includes an overview of indicators that could be used to monitor issues related to gender equality and women's rights, in line with the nine targets and 14 indicators for SDG 5 on gender equality, and the set of indicators developed the Centre of Women's Research (CENWOR) to measure and prove countries' compliance with the Convention on the Elimination of all Forms of Discrimination Against Women (CEDAW) (CENWOR, 2004).

Table 19: Potential indicators to monitor gender equality and women's rights

Elements of safeguarding principle 'Gender equality and women's rights'	Exemplary indicators
Equal opportunity and treatment in employment (based on CEDAW Article 11)	• Number of women employed by the project (CENWOR) • Proportion of women employed by the project (CENWOR) • Proportion of women senior and middle management (SDG indicator 5.5.2) • Number of women who are dismissed from employment during pregnancy or maternity leave (based on CEDAW indicator 11.8)
Equal pay for equal work (based on CEDAW Article 11)	Average hourly earnings for men and women in the project (CENWOR)

Land and Soil Conservation

The safeguarding principle 'land and soil conservation' closely relates to SDG 15: "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss". This principle aims to avoid and/or minimise impact of the project on the surrounding landscape and to promote soil conservation.

Soil quality, together with water and air quality, determines environmental quality (Andrews, Karlen, & Mitchell, 2002). Soil degradation is the decline of soil quality over time and usually a consequence of land misuse (Lal, 1993). Accordingly, measuring soil quality prior to the start of a project, during the project's operations, and after the project has ended, helps determine the project's impact on land and soil. A large number of indicators that describe soil quality exist, depending on the specific condition of the soil that one wishes to measure. Bünemann et al. (2018) suggest using a small set of indicators that give an overall indication of soil status, and any potential negative impacts: soil nitrates; soil pH; soil density; number of earthworms Bünemann et al. (2018).

Depending on the project's specific situation, various indicators may be relevant. Indicators related to land and soil conservation are indicators of a certain 'quality' that can be both negatively or positively affected. That is why the same indicators that are relevant for measuring potential benefits (see sections 4 and 5) are usually also relevant for monitoring to safeguard against potential negative impacts. Again, the key difference is that while the reporting of positive impacts can be done by the targeted assessment of specific indicators, safeguarding against negative impacts requires a broader monitoring across a large range of potential issues, where indicators can play a role.

6.4 Summary of findings for safeguarding against negative impacts

All the programmes assessed recognise the importance of safeguarding against negative impacts – which can cover a range of areas relating to human rights violations but often relate to forced relocation, labour rights and gender aspects – and have put processes in place to address this issue.

Stakeholder engagement and grievance mechanisms are particularly common central elements of these approaches. To be most effective at identifying and addressing project-level negative impacts, stakeholder engagement needs to be continuous, rather than executed in a one-off

isolated process, and requires clarity in the channels of communication. This communication channel, along with those associated with a grievance mechanism, should be at the project-level, rather than the mechanism-level to ensure accessibility for stakeholders who are most affected and potentially most vulnerable.

Indicators can play a role to monitor safeguards, as we have indicated in section 6.3. However, pre-defined indicators alone cannot control for all safeguarding principles, since negative impacts do not only affect a series of pre-defined conditions, but rather approaches are needed to address any number of potential negative impacts which may arise unexpectedly.

7 Conclusions

The assessment of sustainable development impacts can be highly beneficial for the optimisation of project outcomes, if appropriately designed.

Sustainable development impact assessment can facilitate not only a better understanding of the impact of climate change mitigation projects for sustainable development outcomes, but can also incentivise the maximisation of those outcomes. This can help climate change mitigation targets ensure that they are better aligned with the national development agenda and can also help to attract more financial support for their implementation. Voluntary market actors, in particular, have shown interest to target such projects, and are willing to pay a premium for those sustainable development outcomes.

Analysis of existing programmes shows that the practical rationale of the sustainable development impact assessment varies. Such assessments can be conducted for information provision only, or can be done for commodification of the outcomes, either through a form of labelling or crediting. Programmes should be carefully designed to ensure that the approach taken provides the right level of incentive for appropriate sustainable development impact assessment, in order to realise the potential rationale for the assessment. Awareness of sustainable development impacts can facilitate projects to adjust their designs to maximise those outcomes, even if those outcomes are not explicitly commodified by programmes, but this requires that incentives are in place to consider those links already at the project planning stage.

The rigour, and granularity of assessment should be as simple as possible, while providing the detail and accuracy necessary for the specific purpose.

The requirements of sustainable development assessment cannot be generalised but depend on the rationale. Unlike emission reduction monitoring, which involves a single indicator that is objectively defined, "sustainable development" is an umbrella term for a potentially infinite number of indicators, not all of which can be objectively defined the same way. The development of a perfectly objective and all-inclusive sustainable development impact assessment is not possible and should not be the aim. While a perfect assessment is not possible, a conscious decision should be made on the balance between rigour and pragmatism for the assessment approach, with the stringency informed by the purpose of the assessment.

In the case that the purpose is for information only, a *simple identification of potential impacts'* approach with self-reporting and self-evaluation may be sufficient, as it can provide an enhanced understanding of the links to the development agenda without incurring significant transaction costs. However, if sustainable development benefit assessment is carried out to commodify the outcome, either by labeling GHG credits or creating standalone sustainable development impact credits, proving a higher certainty of the sustainable development outcome claims is more important, and a more structured MRV procedure with second or third party scrutiny might be required.

Pragmatic solutions can improve sustainable development impact assessment without increasing complexity.

Whatever level of assessment rigour is deemed most appropriate to fulfil the objectives of a project or crediting programme, our analysis of existing sustainable development indicators shows that some criteria and quick-wins can be identified which improve the effectiveness of those indicators, without necessarily increasing the complexity of the assessment approach.

- Indicator definitions should be specific enough to ensure that there cannot be multiple interpretations of 'the indicator'.

- Multi-dimensional indicators – in which multiple conditions are assessed in one single indicator – can support clearer communication of indicators in some contexts, but are more complex to define and monitor, and not easily comparable. One-dimensional indicators can ensure comparability, can reduce complexity of indicator use, and can still be converted to a multi-dimensional indicator at a later stage for more policy relevant communication if necessary.
- Expressing indicators in absolute terms can support their comparability and ease verification.

While these steps can be taken to increase the effectiveness of indicators, not all issues associated with sustainable development impact assessment can be easily solved. Striving to achieve an extremely high level of robustness for a sustainable development impact assessment will likely result in significant complexity and costs. While there are no perfect solutions for the complete removal of these complexities, the following success factors, identified from the experiences of existing programmes, may reduce them:

- Provision of flexibility in MRV approaches, which allows adapting to specific contexts and capacities;
- Use of national and international default values and standards where possible to reduce disproportional efforts and transaction cost;
- Support access to reliable data sources, e.g. through collaboration with international verifier organisations;
- Inclusion of a management framework at the institutional and organisational level that provides clear responsibilities for each actor in the MRV system;
- Capacity building and training for staff to ensure an adequate MRV implementation.

Stringent safeguards are required to control for potential negative impacts for sustainable development outcomes.

While the assessment approach for the demonstration of positive sustainable development impacts should be determined based on the objectives of the specific programme, the analysis also showed that regardless of the approach taken, it is of key importance that this is complemented by stringent safeguards against potential negative impacts.

All the programmes assessed in this research recognise the importance of safeguarding against negative impacts and have put processes in place to address this issue. Indicators can play an important role in safeguarding against negative impacts, as we have indicated in section 6.3. However, pre-defined indicators alone cannot control for all safeguarding principles, since negative impacts do not only affect a series of pre-defined conditions, but rather approaches are needed to address any number of potential negative impacts which may arise unexpectedly. In particular, stakeholder engagement and grievance mechanisms with clear communication channels at the project-level were noted to be important elements of ensuring that potential negative impacts can be identified and addressed.

Compared with the development of indicators to assess positive sustainable development impacts, there appears to be less of a case for a rigid and structured definition of indicators to address safeguards against negative impacts. However, our analytical overview of existing approaches leads us to the conclusions that adopting thorough modalities and processes for

identifying and avoiding, minimising, and mitigating negative impacts should be stringent requirements for any programme, regardless of the level of stringency that is determined as most appropriate for the assessment of positive sustainable development impacts.

Further research to support the design of programmes the international negotiations.

With the ongoing discussions on Article 6 of the Paris Agreement, there is an important opportunity to learn from the experiences of existing and historical programmes for market-based mechanisms. While exact details for approaches for sustainable development impact assessment and safeguards may not be taken up in the eventual text governing Article 6 for the Paris Rulebook, it is important that the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) provides a clear mandate for further details to be established under a workplan in subsidiary body discussions. In a parallel publication – *Indicators for sustainable development under Article 6 of the Paris Agreement* (forthcoming) – we explore the current state of these negotiations considering their historical context, chart out scenarios for where these negotiations may lead to, and provide suggestions for next steps including a draft work plan for such discussions.

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A Annex I

Rating of the linkages between climate mitigation actions and Sustainable Development Goals

The SCAN-tool (SDGs & Climate Action Nexus tool), developed by NewClimate Institute in collaboration with ECN part of TNO, covers actions across seven mitigation sectors and collects data from several studies on the nexus between climate mitigation action and specific development areas. It can help identify and understand which climate mitigation actions may - positively or negatively - impact specific SDG targets (Gonzales-Zuñiga, Roeser, Rawlins, Luijten, & Granadillos, 2018). In the context of this study, the SCAN-tool is used to develop a systematic approach for rating the SDGs with regards to their potential links to mitigation projects. In a first step, the number of linkages per SDG is identified using the SCAN-tool. This number ranges from two links for SDG 5 (gender equality) to 170 identified links for SDG 8 (decent work and economic growth). In a next step, the number of linkages is scaled to a score between 0 – 10. This number then translates to a qualitative rating from "Limited" to "Very high" which indicates the potential impact of climate mitigation actions on the respective SDG. A score of 0 – 2.5 equates to "Limited", 2.5 - 5 to "Medium", 5 - 7.5 to "High" and 7.5 - 10 to "Very high".

B Annex II

Table 20, overleaf, presents an overview of the full list of project level indicators identified through the research of work package 1. The table indicates whether there are identified links to specific SDGs, and which impact category the indicator can be considered within, as described in section 4.2.

Table 20: List of identified project-level impact indicators

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	Verra CCB	SDG 4		Education
Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Verra CCB	SDG 4		Education
Total number of people for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 3		Health & Safety
Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 3		Health & Safety
Total number of people expected to be employed in project activities, expressed as number of full-time employees	Verra CCB	SDG 8		Jobs
Total number of people expected to have improved livelihoods or income generated as a result of project activities	Verra CCB	SDG 8		Jobs
Number of hectares of existing production forest land in which IFM practices are expected to occur as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 15		Land
Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 15		Land
For REDD projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
For ARR projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Expected change in the number of hectares managed significantly better by the project for biodiversity conservation, measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
Expected number of globally Critically Endangered or Endangered species benefiting from reduced threats as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 6		Water
Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 6		Water
Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	Verra CCB	SDG 4	4.5	Welfare
Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	Verra CCB	SDG 5		Welfare
Number of women expected to have improved livelihoods or income generated as a result of project activities	Verra CCB	SDG 5		Welfare
Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Verra CCB	SDG 5		Welfare
Total number of community members whose well-being is expected to improve as a result of project activities	Verra CCB	SDG 3		Welfare
Number of women whose well-being is expected to improve as a result of project activities	Verra CCB	SDG 5		Welfare
Net estimated emission removals in the project area, measured against the without-project scenario	Verra CCB	SDG 13		Air

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Net estimated emission reductions in the project area, measured against the without-project scenario	Verra CCB	SDG 13		Air
Net emissions of ozone depleting substances (such as CFC-11, CFC-113, Halon 1211, Methyl Chloroform)	ICAT Sustainable Development Guidance	SDG 3		Air
Stratospheric ozone concentration	ICAT Sustainable Development Guidance	SDG 3		Air
Emissions of air pollutants such as particulate matter (PM2.5, PM10), ammonia, ground-level ozone (resulting from volatile organic compounds (VOCs) and nitrogen oxides (NOx)), carbon monoxide, sulphur dioxide, nitrogen dioxide, fly ash, dust, lead, mercury, and other toxic pollutants	ICAT Sustainable Development Guidance	SDG 3	3.9	Air
Air pollutants concentration	ICAT Sustainable Development Guidance	SDG 3	3.9	Air
Aerosol particles concentration	ICAT Sustainable Development Guidance	SDG 3	3.9	Air
Indoor and outdoor air quality	ICAT Sustainable Development Guidance	SDG 3		Air
Visual range (in units of distance)	ICAT Sustainable Development Guidance	SDG 3		Air
Deciview (dv)	ICAT Sustainable Development Guidance	SDG 3		Air
Morbidity (disability-adjusted life years (DALYs), quality-adjusted life year (QALY), and averted disability-adjusted life years (ADALYs)) due to air pollution	ICAT Sustainable Development Guidance	SDG 3		Health & Safety
Mortality (avoided premature deaths per year) due to air pollution	ICAT Sustainable Development Guidance	SDG 3		Health & Safety

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Reduction in SOx	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in NOx	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in Suspended Particular Matter	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in Volatile Organic Compound	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in Particulate Matter	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
New capacity added – renewable energy	UNDP Climate Action Impact Tool	SDG 7	7.2	Balance of Payment
New investments – power generation	UNDP Climate Action Impact Tool	SDG 7	7.2	Balance of Payment
New investments – transmission and distribution	UNDP Climate Action Impact Tool	SDG 7	7.2	Balance of Payment
Renewable as % of total capacity	UNDP Climate Action Impact Tool	SDG 7	7.2	Balance of Payment
Reduction in fossil fuel imports	UNDP Climate Action Impact Tool	SDG 7		Balance of Payment
Additional enrollment in pre-primary education (below 6 years)	UNDP Climate Action Impact Tool	SDG 4	4.2	Education

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Additional enrollment in primary education (7-12 years)	UNDP Climate Action Impact Tool	SDG 4	4.1	Education
Additional enrollment in secondary education (13-18 years)	UNDP Climate Action Impact Tool	SDG 4	4.1	Education
Additional enrollment in vocational, university or tertiary institutions	UNDP Climate Action Impact Tool	SDG 4	4.3	Education
Additional number of teachers/trainers trained	UNDP Climate Action Impact Tool	SDG 4		Education
Additional scholarships provided	UNDP Climate Action Impact Tool	SDG 4	4.b	Education
Additional households with access to clean energy	UNDP Climate Action Impact Tool	SDG 7	7.1	Energy
Additional metered connections	UNDP Climate Action Impact Tool	SDG 7	7.1	Energy
Additional villages with access to grid	UNDP Climate Action Impact Tool	SDG 7	7.1	Energy
Investments in industrial activity under the action (large)	UNDP Climate Action Impact Tool	SDG 9	9.2	Growth
Investments in industrial activity under the action (SME)	UNDP Climate Action Impact Tool	SDG 9	9.3	Growth
Investments in micro and one - person enterprises	UNDP Climate Action Impact Tool	SDG 9	9.1 + 9.3	Growth

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Investments in research and development	UNDP Climate Action Impact Tool	SDG 9	9.5	Growth
Investments in intellectual property rights	UNDP Climate Action Impact Tool	SDG 9	9.5	Growth
Investments in pilot research projects	UNDP Climate Action Impact Tool	SDG 9	9.5	Growth
Investments in transport sector - Road	UNDP Climate Action Impact Tool	SDG 9	9.a	Growth
Investments in transport sector - Rail	UNDP Climate Action Impact Tool	SDG 9	9.a	Growth
Investments in transport sector– Sea and waterways	UNDP Climate Action Impact Tool	SDG 9	9.a	Growth
Investments in transport sector - Air	UNDP Climate Action Impact Tool	SDG 9	9.a	Growth
Investments in climate and disaster risk management (e.g. sea walls)	UNDP Climate Action Impact Tool	SDG 13	13.1	Health & Safety
Investments in public climate risk reduction infrastructure (e.g. stormwater protection)	UNDP Climate Action Impact Tool	SDG 13	13.1	Health & Safety
Investments in emergency services (e.g. flooding)	UNDP Climate Action Impact Tool	SDG 13	13.1	Health & Safety
Investments in water treatment/purification facilities	UNDP Climate Action Impact Tool	SDG 6	6.3	Health & Safety

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Investments in irrigation systems	UNDP Climate Action Impact Tool	SDG 6	6.b	Health & Safety
Investments in water supply systems (e.g. borewells, pipelines)	UNDP Climate Action Impact Tool	SDG 6		Health & Safety
Investments in toilets	UNDP Climate Action Impact Tool	SDG 6		Health & Safety
New land brought under the cultivation	UNDP Climate Action Impact Tool	SDG 2	2.4	Health & Safety
Additional export of crops, animals etc.	UNDP Climate Action Impact Tool	SDG 2	2.b	Health & Safety
Specific investment towards rural infrastructure (e.g. irrigation canals, water pumping etc.)	UNDP Climate Action Impact Tool	SDG 2	2.a	Health & Safety
Specific investment towards research and development (e.g. agriculture productivity, gene banks, livestock etc.)	UNDP Climate Action Impact Tool	SDG 2	2.a	Health & Safety
Number of additional people provided with access to health services	UNDP Climate Action Impact Tool	SDG 2	2.4	Health & Safety
Number of additional children vaccinated	UNDP Climate Action Impact Tool	SDG 2	2.5	Health & Safety
Number of additional health workers directly employed	UNDP Climate Action Impact Tool	SDG 2	2.b	Health & Safety
Number of additional government health programmes organized	UNDP Climate Action Impact Tool	SDG 2	2.a	Health & Safety

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Number of additional people covered by health insurance or public health system	UNDP Climate Action Impact Tool	SDG 2	2.a	Health & Safety
Number of additional health related infrastructure set - up	UNDP Climate Action Impact Tool	SDG 2	2.a	Health & Safety
Number of new jobs created (total)	UNDP Climate Action Impact Tool	SDG 8	8.5	Jobs
Number of new jobs created – people with disabilities	UNDP Climate Action Impact Tool	SDG 8	8.5	Jobs
Number of new jobs created – poor and vulnerable sections	UNDP Climate Action Impact Tool	SDG 8	8.5	Jobs
Number of new jobs created – specialized skills (e.g. Technical)	UNDP Climate Action Impact Tool	SDG 8	8.2	Jobs
Number of new jobs created – senior positions (e.g. managers)	UNDP Climate Action Impact Tool	SDG 8	8.2	Jobs
Migration avoided due to new jobs created (people)	UNDP Climate Action Impact Tool	SDG 8		Jobs
Employees with access to employment benefits (e.g. pension)	UNDP Climate Action Impact Tool	SDG 8	8.5	Jobs
Additional income generated in public sector employment	UNDP Climate Action Impact Tool	SDG 8	8.5	Jobs
Additional income generated in private sector employment	UNDP Climate Action Impact Tool	SDG 8	8.5	Jobs

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Avoided deforestation	UNDP Climate Action Impact Tool	SDG 15	15.2	Land
Afforestation (new forest added)	UNDP Climate Action Impact Tool	SDG 15	15.2	Land
Avoided soil erosion	UNDP Climate Action Impact Tool	SDG 15	15.3	Land
Additional material recycled	UNDP Climate Action Impact Tool	SDG 12	12.5	Land
Additional material composted	UNDP Climate Action Impact Tool	SDG 12	12.3	Land
Additional material directed from uncontrolled landfill/incineration to controlled landfill or incineration	UNDP Climate Action Impact Tool	SDG 12	12.4	Land
Additional e - waste recycled/disposed of appropriately	UNDP Climate Action Impact Tool	SDG 12	12.5	Land
Additionally protected endangered species	UNDP Climate Action Impact Tool	SDG 15	15.5	Natural Resources
Additionally protected reserves	UNDP Climate Action Impact Tool	SDG 15	15.9	Natural Resources
Investments in wastewater systems	UNDP Climate Action Impact Tool	SDG 6	6.3	Water
Reduction in chemical oxygen demand (COD)	UNDP Climate Action Impact Tool	SDG 6	6.3	Water

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Reduction in biochemical oxygen demand (BOD)	UNDP Climate Action Impact Tool	SDG 14		Water
Reduction in bacteria and coliforms	UNDP Climate Action Impact Tool	SDG 14		Water
Reduction in marine pollution	UNDP Climate Action Impact Tool	SDG 14		Water
Reduction in sea/ocean acidification	UNDP Climate Action Impact Tool	SDG 14		Water
Reduction in sustainable fishing	UNDP Climate Action Impact Tool	SDG 14		Water
Reduction in coastal/marine area under conservation	UNDP Climate Action Impact Tool	SDG 14		Water
Additional industrial wastewater treated appropriately	UNDP Climate Action Impact Tool	SDG 6	6.3	Water
Additional number of water treatments – facility level	UNDP Climate Action Impact Tool	SDG 6	6.1	Water
Additional number of water treatments / filtration - household level (e.g. Household water purification system)	UNDP Climate Action Impact Tool	SDG 6	6.2	Water
Additional number of irrigation Systems (e.g. Solar powered irrigation pumps)	UNDP Climate Action Impact Tool	SDG 6	6.4	Water
Additional number of direct water supply sources (e.g. Borewells)	UNDP Climate Action Impact Tool	SDG 6	6.5	Water

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Additional volume of safe water effectively treated / supplied	UNDP Climate Action Impact Tool	SDG 6	6.3	Water
Additional number of people living on more than $1.25 per day	UNDP Climate Action Impact Tool	SDG 1	1.1	Welfare
Additional number of people with social security	UNDP Climate Action Impact Tool	SDG 1	1.3	Welfare
Additional resources to implement programmes and policies for poverty reduction	UNDP Climate Action Impact Tool	SDG 1	1.a	Welfare
Additional gender-sensitive policy frameworks at regional and national level to accelerate investment in poverty reduction	UNDP Climate Action Impact Tool	SDG 1	1.b	Welfare
Additional policy frameworks at regional and national level to reduce inequality and empower vulnerable groups	UNDP Climate Action Impact Tool	SDG 10	10.3	Welfare
Additional number of people from vulnerable backgrounds participating in decision-making	UNDP Climate Action Impact Tool	SDG 10	10.6	Welfare
Additional official development assistance including foreign direct investment for community/country	UNDP Climate Action Impact Tool	SDG 10	10.b	Welfare
Number of women employed under the action	UNDP Climate Action Impact Tool	SDG 5		Welfare
Number of women trained under the action	UNDP Climate Action Impact Tool	SDG 5		Welfare
Number of women selected for decision making position (e.g. Senior managers, community leaders etc.)	UNDP Climate Action Impact Tool	SDG 5	5.5	Welfare

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Number of women provided with access to modern technology and/or finance (e.g. Microfinance, mobile phones etc.)	UNDP Climate Action Impact Tool	SDG 5	5.b	Welfare
Investments in solid waste management systems	UNDP Climate Action Impact Tool	SDG 12	12.2	Land
Investments in landfill sites and municipal waste	UNDP Climate Action Impact Tool	SDG 12	12.5	Land
Investments in industrial waste management systems	UNDP Climate Action Impact Tool	SDG 12	12.2	Land
Additional units of housing (high, medium, low - income)	UNDP Climate Action Impact Tool	SDG 11	11.1	Welfare
Investment in housing	UNDP Climate Action Impact Tool	SDG 11	11.1	Welfare
Slum rehabilitation	UNDP Climate Action Impact Tool	SDG 11	11.1	Welfare
Investment in slum rehabilitation	UNDP Climate Action Impact Tool	SDG 11	11.1	Welfare
Investment in green/resources - efficient buildings	UNDP Climate Action Impact Tool	SDG 11		Welfare
# of cases of conflict reported due to REDD+ activities	UN REDD+	SDG 16		Balance of Payment
# of REDD+ projects that conducted conflict analysis prior to implementation	UN REDD+	SDG 16		Balance of Payment

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
# of land conflicts reported in areas where REDD+ actions are implemented	UN REDD+	SDG 16		Balance of Payment
# people that have benefited from training for improved livelihoods through REDD+ actions	UN REDD+	SDG 4		Education
Indicator E.5.1 # people with improved food security (more food, more nutritious, available throughout the year) through REDD+ actions	UN REDD+	SDG 2		Health & Safety
Types of compensation provided for livelihood restoration	UN REDD+	SDG 8		Jobs
# of households with diversified livelihoods	UN REDD+	SDG 8		Jobs
# people that have benefited from jobs through REDD+ actions	UN REDD+	SDG 8		Jobs
Indicator E.1.1 # high conservation value (HCV) areas identified and mapped in areas where REDD+ will support logging and oil palm, and additionally high carbon stock (HCS) areas where oil palm is supported	UN REDD+	SDG 15		Land
Indicator E.3.3 # of interventions aimed at agricultural diversification involving pesticide use which have integrated pest management plans in place	UN REDD+	SDG 15		Land
# of REDD+ projects that contribute to National Climate Change Policy and Strategy and related	UN REDD+	SDG 13		NA
Type of contribution of REDD+ projects to National Climate Change Policy and Strategy	UN REDD+	SDG 13		NA
# of REDD+ coordination meetings among inter-agencies and technical working groups	UN REDD+	NA		NA
# Regional Inter-Agency Task Team (RIAT) meetings held	UN REDD+	NA		NA
% of REDD+ documents including strategies, plans, programs and projects that are publicly accessible.	UN REDD+	NA		NA
% of REDD+ contracts awarded through competitive bidding.	UN REDD+	NA		NA

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
% of projects for which annual audited reports have been submitted	UN REDD+	NA		NA
% of REDD+ governance structures with published TOR and internal regulations	UN REDD+	NA		NA
# of meeting minutes or other reports of REDD+ governance structures that demonstrate adherence to the internal regulations and are shared publicly	UN REDD+	NA		NA
# of enforcement actions supported by REDD+	UN REDD+	NA		NA
% and volume of timber products for export supported by REDD+ that are registered in the national Chain of Custody system	UN REDD+	NA		NA
# of different types of contribution of REDD+ projects to enhance resources and capacity of law enforcement	UN REDD+	NA		NA
# of social or co- management agreements for REDD+ activities	UN REDD+	NA		NA
# of projects that have conducted environmental and social risk screening, and developed livelihood restoration plans as needed	UN REDD+	SDG 1		Welfare
% of REDD+ projects that demonstrate compliance with the Community Consultation Guidelines	UN REDD+	NA		NA
# of sites of cultural importance identified and respected through appropriate measures	UN REDD+	NA		NA
# stakeholder analysis conducted and # stakeholder engagement plans	UN REDD+	NA		NA
# plans and reports communicated and adapted in response to stakeholder consultation	UN REDD+	NA		NA
# of young people disaggregated by gender, participating in each REDD+ consultation	UN REDD+	SDG 5		Welfare
# of stakeholder meetings held	UN REDD+	NA		NA
type of capacity building and other support to stakeholder representatives to represent their constituents	UN REDD+	NA		NA

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Level of information dissemination and understanding of people (including women and youth) about REDD+ activities in their area	UN REDD+	NA		NA
# Projects that have completed environmental screening and classification, conducted ESIA if required and have approved and implemented ESMP or other plans as required	UN REDD+	SDG 15		Natural Resources
# concessions supported by REDD+ certified to sustainability standards (RSPO, FSC etc.)	UN REDD+	NA		NA
# participatory land use plans supported by REDD+	UN REDD+	NA		NA
# of REDD+ projects consistent with National Forestry Reform Law and related policies and strategies	UN REDD+	SDG 15		Natural Resources
# of REDD+ projects that contribute to Liberia's biodiversity policies	UN REDD+	SDG 15		Natural Resources
# ha of natural forests, HCV or HCS areas converted resulting from REDD+ support, where relevant	UN REDD+	SDG 15		Natural Resources
Existence of spatial analysis of drivers of deforestation	UN REDD+	SDG 15		Natural Resources
# projects designed and implemented to explicitly address local drivers of deforestation	UN REDD+	SDG 15		Natural Resources
Type of contribution to Pro-Poor Agenda for Prosperity and Development (PAPD)	UN REDD+	SDG 1		Welfare
% of women and men participants in REDD+ activities and decision-making.	UN REDD+	SDG 5		Welfare
Relative impacts of REDD+ activities on women and men	UN REDD+	SDG 5		Welfare
# of REDD+ projects that address differences in impacts between men and women	UN REDD+	SDG 5		Welfare
# maps of rights to land and resources supported by REDD+	UN REDD+	SDG 1		Welfare

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
# of communities with registered customary claims to land with support from REDD+ action	UN REDD+	SDG 1		Welfare
% of REDD+ projects for which the cost and benefits are assessed for all stakeholder groups	UN REDD+	SDG		Welfare
type of benefits shared with different stakeholder groups	UN REDD+	SDG 8		Welfare
Changes in household income in areas where REDD+ is implemented	UN REDD+	SDG 1		Welfare
Number in open dump fires	Gold Standard for Global Goals	SDG 11	11.6	Air
Noise pollution	Gold Standard for Global Goals	SDG 11	11.6	Air
Total energy and industry-related GHG emissions by gas and sector, expressed as production and demand-based emissions (tCO2e)	Gold Standard for Global Goals	SDG 13	13.2	Air
Net GHG emissions in the Agriculture, Forest and other Land Use (AFOLU) sector (tCO2e)	Gold Standard for Global Goals	SDG 13	13.2	Air
Per capita greenhouse gas emissions	Gold Standard for Global Goals	SDG 13	13.2	Air
GHGs emissions by sector (City GHGs emission inventory)	Gold Standard for Global Goals	SDG 13	13.2	Air
Official climate financing from developed countries that is incremental to ODA in US$	Gold Standard for Global Goals	SDG 13	13.a	Balance of Payment
Workshop, seminars, and training related activities for capacity-building	Gold Standard for Global Goals	SDG 17	17.6	Education
Indicator on international cooperation and capacity building in water and sanitation-related activities (in development)	Gold Standard for Global Goals	SDG 6	6.a	Health & Safety

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Indicator on participation of local communities for improving water and sanitation management (in development)	Gold Standard for Global Goals	SDG 6	6.b	Health & Safety
Soil quality improvement	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of urban solid waste regularly collected and well managed	Gold Standard for Global Goals	SDG 11	11.6	Land
Total annual municipal waste collected	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of the total municipal solid waste disposed of in sanitary landfills	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of the city's municipal solid waste that is disposed of in open dumps, controlled dumps, or bodies of water or is burnt	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of municipal waste composted	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of municipal waste used for energy generation	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of municipal waste recycled	Gold Standard for Global Goals	SDG 11	11.6	Land
Percentage of population with regular municipal solid waste collection	Gold Standard for Global Goals	SDG 11	11.6	Land
Losses from natural disasters, by climate and non-climate-related events in US$ and lives lost	Gold Standard for Global Goals	SDG 12	13.1	NA

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Availability and implementation of a transparent and detailed deep decarbonization strategy, consistent with the 2°C or below global carbon budget, and with GHG emission targets for 2020, 2030 and 2050.	Gold Standard for Global Goals	SDG 12	13.3	NA
Co-ordination mechanism to mainstream the climate resilience in city, including sector, planning	Gold Standard for Global Goals	SDG 17	17.6	NA
climatearea per 100,000 residents	Gold Standard for Global Goals	SDG 11	11.7	Natural Resources
Ratio of land consumption rate to population growth rate, at comparable scale (in development)	Gold Standard for Global Goals	SDG 11	11.7	Natural Resources
Percentage change in number of native species	Gold Standard for Global Goals	SDG 15	15.5	Natural Resources
Presence of urban building codes stipulating either the use of local materials and/or new energy efficient technologies or with incentives for the same	Gold Standard for Global Goals	SDG 11	11.c	Technology
Percentage of water lost in the water distribution system	Gold Standard for Global Goals	SDG 11	11.6	Water
Percentage of wastewater flows treated to national standards [and reused]	Gold Standard for Global Goals	SDG 11	11.6	Water
Area of public space as a proportion of total city space	Gold Standard for Global Goals	SDG 11	11.7	Welfare
(Net) urban population density	Gold Standard for Global Goals	SDG 11	11.7	Welfare
12.a.1 Amount of support to developing countries on research and development for sustainable consumption and production and environmentally sound technologies	SDG Indicator	SDG 12		Technology

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
7.2.1 Renewable energy share in the total final energy consumption	SDG Indicator	SDG 7		Energy
8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	SDG Indicator	SDG 8		Jobs
8.4.1 Material footprint, material footprint per capita, and material footprint per GDP	SDG Indicator	SDG 8		Natural Resources
15.2.1 Progress towards sustainable forest management	SDG Indicator	SDG 15		Natural Resources
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	SDG Indicator	SDG 6		Water
6.5.1 Degree of integrated water resources management implementation (0-100)	SDG Indicator	SDG 6		Water
5.1.1 Whether or not legal frameworks are in place to promote, enforce and monitor equality and non-discrimination on the basis of sex	SDG Indicator	SDG 5		Welfare
5.5.2 Proportion of women in managerial positions	SDG Indicator	SDG 5		Welfare
Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities	Verra CCB	SDG 4		Education
Total number of people for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Verra CCB	SDG 4		Education
Total number of people for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 3		Health & Safety
Number of women for whom health services are expected to improve as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 3		Health & Safety
Total number of people expected to be employed in project activities, expressed as number of full-time employees	Verra CCB	SDG 8		Jobs

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Total number of people expected to have improved livelihoods or income generated as a result of project activities	Verra CCB	SDG 8		Jobs
Number of hectares of existing production forest land in which IFM practices are expected to occur as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 15		Land
Number of hectares of non-forest land in which improved land management practices are expected to occur as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 15		Land
For REDD projects: Estimated number of hectares of reduced forest loss in the project area measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
For ARR projects: Estimated number of hectares of forest cover increased in the project area measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
Expected change in the number of hectares managed significantly better by the project for biodiversity conservation, measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
Expected number of globally Critically Endangered or Endangered species benefiting from reduced threats as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 15		Natural Resources
Total number of people who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 6		Water
Number of women who are expected to experience increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	Verra CCB	SDG 6		Water
Number of female community members who are expected to have improved skills and/or knowledge resulting from training as part of project activities	Verra CCB	SDG 4	4.5	Welfare

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Number of women expected to be employed as a result of project activities, expressed as number of full-time employees	Verra CCB	SDG 5		Welfare
Number of women expected to have improved livelihoods or income generated as a result of project activities	Verra CCB	SDG 5		Welfare
Number of women and girls for whom access to, or quality of, education is expected to improve as result of project activities, measured against the without-project scenario	Verra CCB	SDG 5		Welfare
Total number of community members whose well-being is expected to improve as a result of project activities	Verra CCB	SDG 3		Welfare
Number of women whose well-being is expected to improve as a result of project activities	Verra CCB	SDG 5		Welfare
Net estimated emission removals in the project area, measured against the without-project scenario	Verra CCB	SDG 13		Air
Net estimated emission reductions in the project area, measured against the without-project scenario	Verra CCB	SDG 13		Air
Net emissions of ozone depleting substances (such as CFC-11, CFC-113, Halon 1211, Methyl Chloroform)	ICAT Sustainable Development Guidance	SDG 3		Air
Stratospheric ozone concentration	ICAT Sustainable Development Guidance	SDG 3		Air
Emissions of air pollutants such as particulate matter (PM2.5, PM10), ammonia, ground-level ozone (resulting from volatile organic compounds (VOCs) and nitrogen oxides (NOx)), carbon monoxide, sulphur dioxide, nitrogen dioxide, fly ash, dust, lead, mercury, and other toxic pollutants	ICAT Sustainable Development Guidance	SDG 3	3.9	Air
Air pollutants concentration	ICAT Sustainable Development Guidance	SDG 3	3.9	Air

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
Aerosol particles concentration	ICAT Sustainable Development Guidance	SDG 3	3.9	Air
Indoor and outdoor air quality	ICAT Sustainable Development Guidance	SDG 3		Air
Visual range (in units of distance)	ICAT Sustainable Development Guidance	SDG 3		Air
Deciview (dv)	ICAT Sustainable Development Guidance	SDG 3		Air
Morbidity (disability-adjusted life years (DALYs), quality-adjusted life year (QALY), and averted disability-adjusted life years (ADALYs)) due to air pollution	ICAT Sustainable Development Guidance	SDG 3		Health & Safety
Mortality (avoided premature deaths per year) due to air pollution	ICAT Sustainable Development Guidance	SDG 3		Health & Safety
Reduction in SOx	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in NOx	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in Suspended Particular Matter	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in Volatile Organic Compound	UNDP Climate Action Impact Tool	SDG 3	3.9	Air
Reduction in Particulate Matter	UNDP Climate Action Impact Tool	SDG 3	3.9	Air

Indicator	Programme	SDG link	Specific SDG target (if any)	Impact Category
New capacity added – renewable energy	UNDP Climate Action Impact Tool	SDG 7	7.2	Balance of Payment

C Annex III

Indicator 1 + 2: Welfare - *Investment in housing* and *Investment in green/resources - efficient buildings*

Table 21: Proposed indicator definition and specification

	Simple - Investment	**Complex - Investment**
Indicator	Number of housing units n_y	Number of housing units in green/resources - efficient buildings
Data Unit	Number of housing units per year (No.)	Number of housing units per year (No.)
Description	Number of adequate, safe and affordable housing units built with new investments per year providing minimum living standards, such as access to improved water supply and sanitation, sufficient living area, and durability of housing.	Number of in green/resources - efficient housing units built with new investments per year fulfilling minimum energy / resource efficiency standards.
SDG relation (target)	SDG Target 11.1: Safe and affordable housing	SDG Target 11.1: Safe and affordable housing
Measurement procedures and source of data	*Direct measuring (specific, absolute, improvement)*: Number of housing units are measured directly by the project according to project records, balance sheet or as per annual report. • Number of new houses built as a direct consequence of the project	*Direct measuring (specific, absolute, improvement)*: Number of housing units are measured directly by the project according to project records, balance sheet or as per annual report. • Number of new houses built as a direct consequence of the project. In order to specify efficiency standards an energy performance benchmarks based on whole-house energy performance should be defined, e.g. • Current common prevailing practice according to current building codes / energy conservation ordinance resulting in energy consumption x kWh/m^{2}a *or* historical performance benchmark of existing building stock built in the last 5 years • New buildings with higher efficiency, i.e. less energy consumption than the performance benchmark Different categories could be introduced that compare the efficiency standard to the benchmark, e.g. efficiency category 60

		corresponds to an energy consumption of 40% below the performance benchmark.[26]
Baseline and target value (if, direct impact objective of the project)	Baseline - Number of housing: 0 Target - Number of housing: y no. of housing units	Baseline - Number of housing: 0 Target - Number of housing: y no. of housing units
Monitoring frequency	Annually reporting of measured / recorded values. To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and continuously operated throughout the lifetime of the project	Annual reporting of measured values. To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and continuously operated throughout the lifetime of the project
Verification and QC and QA procedures	QC: Project owner / proponent collects data and preparing monitoring records based on clearly assignable identification number for each housing unit / building (incl. location, address, coordinates and ID). The project checks that assumptions and criteria for selection of housing boundaries, housing standards, base years, activity data and other parameters are documented. If national data is available, comparison against such data should take place. QA: Data and information provided by the project proponent, i.e. number of housing or USD spent, should be checked internally through a technical review by a person not involved in the data collection and processing to ensure the accuracy and completeness of data. In case of errors, corrective action will be applied to avoid future similar mistakes. For data quality assurance the reviewer should review and check: a) the accuracy, completeness, and consistency of all monitored data; b) collected data to verify that each project activity has been implemented and is performing as expected, i.e. meeting the required housing performance standards; c) ensure data have been properly entered into data templates, forms, or software. Make plausibility check with external national, local statistics on new housing developments, e.g. building and construction permits in the municipality / region. Check consistency of the monitored records with the records from previous monitoring intervals.	QC: Project owner / proponent collects data and preparing monitoring records based on clearly assignable identification number for each housing unit / building (incl. location, address, coordinates and ID). The project checks that assumptions and criteria for selection of housing boundaries, housing standards, base years, activity data and other parameters are documented. If national data is available, comparison against such data should take place. QA: Data and information provided by the project proponent, i.e. number of housing or USD spent, should be checked internally through a technical review by a person not involved in the data collection and processing to ensure the accuracy and completeness of data. In case of errors, corrective action will be applied to avoid future similar mistakes. For data quality assurance the reviewer should review and check: a) the accuracy, completeness, and consistency of all monitored data; b) collected data to verify that each project activity has been implemented and is performing as expected, i.e. meeting the required housing performance standards; c) ensure data have been properly entered into data templates, forms, or software. Make plausibility check with external national, local statistics on new housing developments, e.g. building and construction permits in the municipality / region. Check consistency

[26] Similar KfW Efficiency House Standard,

	External Verification: Should include a desk review of the monitoring record (reports) for the number of houses and investments; Number and standard of housing units should be verified by external third party through annual on-site audits. This should be undertaking for a minimum sampling number representing a representative amount of dwelling / buildings. Verification needs to occur for the baseline (e.g. energy performance benchmark of baseline houses) and the project activities (e.g. housing living standards and energy demand for individual buildings). Onsite spot check for at least a representative number of housings should verify the performance of the project buildings.	of the monitored records with the records from previous monitoring intervals. External Verification: Should include a desk review of the monitoring record (reports) for the number of houses and investments; Number and standard of housing units should be verified by external third party through annual on-site audits. This should be undertaking for a minimum sampling number representing a representative amount of dwelling / buildings. Verification needs to occur for the baseline (e.g. energy performance benchmark of baseline houses) and the project activities (e.g. housing living standards and energy demand for individual buildings). Onsite spot check for at least a representative number of housings should verify the performance of the project buildings.
Comments	Definition of proper, safe and affordable housing: The indicator measures the number of housing (of urban population) providing proper housing, e.g. no slums, informal settlements or inadequate housing. According to the UN a slum household is defined as a group of individuals living under the same roof lacking one or more of the following conditions: access to improved water, access to improved sanitation, sufficient living area, and durability of housing. National and local definitions and regulations of what is proper, safe and affordable should be taken into consideration and documented to determine in the national context: “adequate”, “safe”, “affordable”	Definition of standards / requirements of green/resources - efficient buildings required (different standards exits per country, e.g. due to climate condition, cultural living practice and technical construction practices. National and local definitions and regulations on energy standards, e.g. building codes, shall be take into consideration. Energy performance and demand can vary significantly depending on the climate zone, the construction standards, building type (e.g. residential, commercial, public) and behaviour of the occupants. Normalisation with the help of Heating Degree Days (HDD) or Cooling Degree Days (CDD) will facilitate the comparison between different regional conditions.

Table 22: Assessment against criteria for effective indicators

Criteria	Simple indicator	Complex indicator
Criteria 1: The indicator refers to a specific individual outcome.		
Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.		
Criteria 3: The indicator is a quantitative metric.		
Criteria 4: The indicator can be determined without calculations which require input assumptions.		
Criteria 5: The complexity of the MRV is manageable.		
Criteria 6: The indicator can be monitored with own information and data.		
Criteria 7: The indicator should relate to specific targets of the SDGs.		
Criteria 8: The indicator directly relates to national legislation or international treaties.[27]		

[27] Criteria 8 is dependent on the country context of the individual project and therefore not assessed in this analysis

Indicator 3 + 4: Welfare - *Number of women employed under the action* and *Number of women provided with access to modern technology and/or finance (e.g. microfinance, mobile phones etc.)*

Table 23: Proposed indicator definition and specification

	Simple - Investment	Complex - Investment
Indicator	Number of women employed under the action	Number of women provided with access to modern technology and/or finance (e.g. microfinance, mobile phones etc.)
Data Unit	Number of jobs for women generated by the project (No./year)	Number of women who have an account at various financial institutions (No./year) *Or* Number of women who own a mobile phone (No./year)
Description	Increasing the number of women having a job. Employment promotion of women enhance women's economic empowerment and ensure equal access to and control over productive resources, services, and assets, such as land, other property, income, information, financial services, and other economic opportunities.	Increasing the number of women who have access to modern technologies in order to enhance women's economic empowerment and ensure equal access to and control over productive resources, services, and assets, such as land, other property, income, information, financial services, and other economic opportunities.
SDG relation (target)	SDG target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic, and public life	SDG target 5.b: Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women
Measurement procedures and source of data	Direct measuring (specific, absolute, improvement): Number of women employed due to project activities are measured directly by the project: Number of created jobs for women as per company staff records or balance sheet Indirect measuring (aggregated, proportional, improvement): Proportion of women employed (in proportion to the share of the company/region/country) Using existing sex-disaggregated baseline data (from national, international statistics)	Direct measuring (specific, absolute, improvement): Number of women provided with access to modern technology and/or finance due to project activities are measured directly by the project: Number of women who have an account at various financial institutions, sourced from records of the financial institutions or through surveying Number of women who own a mobile phone (No./year) sourced from records of the mobile phone companies or through surveying Indirect measuring (aggregated, proportional, improvement): Proportion of women having access to modern technology and/or finance (in proportion to the share of the company/region/country)

		Using existing sex-disaggregated baseline data (from national, international statistics)
Baseline and target value (if, direct impact objective of the project)	Baseline: Direct investments / number of women employed under the action: 0 Target: Direct investments / number of women employed under the action: x in year xy	Baseline: Direct investment/ Share of women who have an account at various financial institutions: x No. in year xy) Direct investment/Share of women who own a mobile phone: x No. in year xy Target: Direct investment/ Share of women who have an account at various financial institutions: x No. in year xy) Direct investment/Share of women who own a mobile phone: x No. in year xy
Monitoring frequency	Data collection and reporting is based on an annual basis. Monitoring and evaluation processes involve both women and men data.	Data collection and reporting is based on an annual basis. Monitoring and evaluation processes involve both women and men data.
Verification and QC and QA procedures	QC: To ensure the accuracy of the data collection, the reported information should be compared to collected data from personnel records, company balance sheet, etc. QA: Check the consistency of the monitored data with data records from previous monitoring intervals, internal double-checks are carried out, Aggregated data should be reviewed and modified as appropriate External Verification: External verification can take place in form of site visits/interviews of personnel from the project.	QC: To ensure the accuracy of the data, the reported information shall be compared to aggregated account information provided by financial institutions and mobile phone operators. QA: Check the consistency of the monitored data with data records from previous monitoring intervals, internal double-checks are carried out, Aggregated data should be reviewed and modified as appropriate. External Verification: External verification can take place in form of site visits/interviews with personnel from financial institutions and mobile phone operators.
Comments		

Table 24: Assessment against criteria for effective indicators

Criteria	Simple indicator	Complex indicator
Criteria 1: The indicator refers to a specific individual outcome.		
Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.		
Criteria 3: The indicator is a quantitative metric.		
Criteria 4: The indicator can be determined without calculations which require input assumptions.		
Criteria 5: The complexity of the MRV is manageable.		
Criteria 6: The indicator can be monitored with own information and data.		
Criteria 7: The indicator should relate to specific targets of the SDGs.		
Criteria 8: The indicator directly relates to national legislation or international treaties.		

Indicator 5 + 6: Land - *Additional material composted* and *Percentage of municipal waste composted*

Table 25: Proposed indicator definition and specification

	Simple – Investment	Complex - Investment
Indicator	Additional material composted	Percentage of municipal waste composted
Data Unit	Total quantity of waste composted at the facility (tonnes per month/year)	Total quantity of municipal waste composted (tonnes per month/year)

Description	The amount of waste under aerobic treatments such as composting and proper soil application of the compost to treat biomass or other organic matter in a controlled biological way.	The percentage of municipal waste under aerobic treatments such as composting and proper soil application of the compost to treat biomass or other organic matter in a controlled biological way.
SDG relation (target)	SDG Target 11.6: Reduce the environmental impact of cities	SDG Target 11.6: Reduce the environmental impact of cities

Measurement procedures and source of data	Direct measuring (specific, absolute, improvement): Additional composting caused by project activities are measured directly by the project:
	• Treated waste in tonnes by using a weighbridge or any other applicable and calibrated weighing device, e.g. belt-scales
	  ○ Weighting of waste delivered into the composting facility using the carrying capacity/weight of each truck (in tonnes) or belt delivering waste to the composting installation in year y. Measuring each truck with help of an weight or take random samples of trucks to determine the average load carried
	  ○ If the compost facility sells its compost on, then the quantity of compost sold from order books could be used a measurement procedure and QC
	Alternatively, indirect measuring can be used, if direct data are not available:
	• Total amount of waste prevented from disposal (tons per month)
		Direct measuring (specific, absolute, improvement): Additional composting caused by project activities are measured directly by the project:
		• Treated waste in tonnes by using a weighbridge or any other applicable and calibrated weighing device, e.g. belt-scales

Baseline and target value (if, direct impact objective of the project)	Baseline: • Direct investments / number of tonnes of composting waste: x tonnes/month xy Target: • Direct investments / number of tonnes of composting waste: y tons/month xy	Baseline: • Total quantity of municipal waste composted: x tonnes/month or year xy • Quantity of composting in proportion to the total waste of the municipal: x %/month or year xy Target:

		• Total quantity of municipal waste composted: y tonnes/month or year xy • Quantity of composting in proportion to the total waste of the municipal: y %/month or year xy
Monitoring frequency	On site-measurement: Continuous data collection is carried out through truck or belt weighting every time new material enters or leaves the facility. Reporting is performed on a daily and monthly basis with aggregation for annual reporting. In the case of an existing composting plant, an inventory is carried out before the start of the project.	On site-measurement: Continuous data collection is carried out through truck or belt weighting every time new material enters or leaves the facility. Reporting is performed on a daily and monthly basis with aggregation for annual reporting. In the case of an existing composting plant, an inventory is carried out before the start of the project.
Verification and QC and QA procedures	QC (quality control): Maintenance and calibration of equipment: Weighbridge or any other applicable weighing device is subject to periodic calibration (in accordance with stipulation of the weighing device supplier) Regular and rotating on-site-data collection to obtain reliable and realistic monitoring data; collected data are compared with existing data (from previous composting activities) or national data QA: Check the consistency of the monitored data with data records from previous monitoring intervals; in order to ensure the accuracy of the data collection, internal double-checks are carried out External Verification: an external sample of the compost on site to check whether a minimum quality standard has been reached and whether aerobic conditions for further degradation are ensured	QC (quality control): Maintenance and calibration of equipment: Weighbridge or any other applicable weighing device is subject to periodic calibration (in accordance with stipulation of the weighing device supplier) Regular and rotating on-site-data collection to obtain reliable and realistic monitoring data; collected data are compared with existing data (from previous composting activities) or national data QA: Check the consistency of the monitored data with data records from previous monitoring intervals; in order to ensure the accuracy of the data collection, internal double-checks are carried out External Verification: an external sample of the compost on site to check whether a minimum quality standard has been reached and whether aerobic conditions for further degradation are ensured
Comments	Definition of compost: Compost is a mixture of various decaying organic waste while Composting describes the part of the nutrient cycle in which organic material is broken down by soil organisms (heterotrophic) under the influence of atmospheric oxygen (aerobic). In addition to carbon dioxide, water-soluble minerals such as nitrates, ammonium salts, phosphates, potassium and magnesium compounds, which act as fertilizers, are emitted.	Definition of compost: Compost is a mixture of various decaying organic waste while composting describes the part of the nutrient cycle in which organic material is broken down by soil organisms (heterotrophic) under the influence of atmospheric oxygen (aerobic). In addition to carbon dioxide, water-soluble minerals such as nitrates, ammonium salts, phosphates, potassium and magnesium compounds, which act as fertilizers, are emitted.

	Identified landfill(s) should be able to accommodate the waste to be used for the duration of the project	Definition of municipal and other waste management: Municipal Solid Waste is waste generated by households, and waste of a similar nature generated by commercial and business establishments, industrial and agricultural premises, institutions such as schools and hospitals, public spaces such as parks and streets and construction sites. Neither hospital nor industrial waste may be treated by anaerobic digestion, thermal treatment or mechanical treatment.

Table 26: Assessment against criteria for effective indicators

Criteria	Simple indicator	Complex indicator
Criteria 1: The indicator refers to a specific individual outcome.		
Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.		
Criteria 3: The indicator is a quantitative metric.		
Criteria 4: The indicator can be determined without calculations which require input assumptions.		
Criteria 5: The complexity of the MRV is manageable.		
Criteria 6: The indicator can be monitored with own information and data.		
Criteria 7: The indicator should relate to specific targets of the SDGs.		
Criteria 8: The indicator directly relates to national legislation or international treaties.		

Indicator 7 + 8: Land - *Additional material composted* and *Percentage of municipal waste composted*

Table 27: Proposed indicator definition and specification

	1a – Soil quality (simple; avoided)	1b – Soil quality (complex; avoided)	2 – Soil quality (improvement)
Indicator	Magnitude of soil erosion	Area affected by severe soil erosion	Soil stability
Data Unit	Magnitude of total soil loss by soil erosion (t/ Ha)	Area affected by soil severe erosion (km^2 or % of defined region)(sever erosion defined as >11 t/Ha)	Aggregate stability of soil (% of soil with aggregates > 0.25mm)
Description	Soil erosion is the physical loss of soil from an area by wind, water or other means. Land management practices may help to avoid soil erosion. The indicator assesses the mass of soil that is lost per hectare of land over a period of time.	Soil erosion is the physical loss of soil from an area by wind, water or other means. Land management practices may help to avoid soil erosion. The indicator assesses the extent of the area of land (either expressed in absolute terms in hectares or as a % of the study area) which is considered to be affected by severe erosion, defined as the loss of more than 11 tonnes of soil per hectare per year.	Soil aggregates are groups of soil particles that bind to each other more strongly than to adjacent particles. Aggregate stability refers to the ability of soil aggregates to resist disintegration when disruptive forces associated with tillage and water or wind erosion are applied. The indicator shows the proportion of soil which contains aggregates of soil particles that are greater than 0.25mm.
SDG relation (target)	SDG Target 15.3: By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.		
Measurement procedures and source of data	Several measurement options are available and any one of them could be used depending on the means most easily available to the project operator. • Measurements of soil height against erosion stakes (each mm change is equivalent to approximately 12 t/Ha assuming a bulk density of 1.2 g/cm^3; high uncertainty range of 36-60 t/Ha) • Contour plotting frames (high accuracy though only suitable for very small land areas; perhaps suitable for micro-scale agriculture and land use management). • Runoff plots where collectors are stationed at artificial boundaries to physically monitor the volume of soil run-off (high accuracy though only suitable for cultivated fields)		Reliable data at the project level can only be achieved through soil sampling techniques on-site (sampling techniques require only very basic specialised measurement equipment)

	• Mesh bags can be used to measure changes in the distribution of soil across a field (the accuracy of the approach is uncertain, though trials show correlation to the results from other approaches such as run-off plots). Measurements should be taken in multiple areas across the study area to define either an average for the area analysed for the simple indicator or the proportion of the land area where severe erosion takes place, for the complex indicator. The different measurement methods entail different uncertainties. The project owner could choose which method is most pragmatic for application in the local context, as long as there is transparency in the method chosen and the associated uncertainty. While any of the methods may be suitable for indicating a reliable trend and therefore for informational purpose or a labelling scheme, there may be differences in the suitability of different methods for sustainable development impact crediting approaches, if the crediting approaches should be proportional to the specific incremental impacts.
Baseline and target value	Baseline: A method is required to assess what would have happened in the absence of the project. The baseline value sought is as follows: *magnitude of total soil loss by soil erosion (t/Ha); area affected by soil severe erosion (km^2 or % of defined region); aggregate stability of soil (% of soil with aggregates > 0.25mm)* The following approaches could be applied, depending on the means available to the project site: • Corresponding measurements at a similar plot of land that is not covered by the measures and can therefore act as a control site. • Comparison to trends on the same plot of land in previous years, if available. Since the factors affecting soil erosion and soil quality, and external influences acting on the land, are unique for each plot of land at any point of time, all potential approaches for establishing a baseline contain considerable uncertainties since it cannot be determined that unique external factors are not in play at the target area. Target value: *change in the magnitude of total soil loss by soil erosion (t/Ha) change in area affected by soil severe erosion (km^2 or % of defined region); improvement in the aggregate stability of soil (% of soil with aggregates > 0.25mm)*
Monitoring frequency	Monitoring is required on at least a monthly basis to achieve a reliable annual average that is not over sensitive to fluctuations attributed to individual weather events.

Verification	QC: Collect data and preparing monitoring records based on the chosen approach for measurement; since several monitoring approaches are available, it is important to clearly document and report the approach taken and any uncertainty associated with the approach, given the local context. Check that assumptions and criteria for selection of boundaries, base years, activity data and other parameters are documented. QA: Check accuracy, completeness, and consistency of all monitored data. Make plausibility check with external statistics or reports from other similar projects. External Verification: External verification would be needed in order to confirm the legitimacy of the baseline. Since it is not possible to objectively provide evidence of a baseline for soil erosion without the project, as per the issues identified above, independent expert judgement is required to identify whether or not external factors could cause the target area to deviate from either its historical trend or the trend of a control area. In the likely situation that the involvement of an external professional third-party verifier is not feasible, both due to cost considerations and insufficient knowledge of the local landscape, a trusted third-party local stakeholder could provide their impartial opinion on the legitimacy of the recordings. This is difficult to establish and also not necessarily reliable. External verification *could* also be extended to on-site spot checks to verify that the chosen method for measurements is applied correctly, and appropriate documentation.
Further comments	

Table 28: Assessment against criteria for effective indicators

Criteria	1	2	3
Criteria 1: The indicator refers to a specific individual outcome.			
Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.			
Criteria 3: The indicator is a quantitative metric.			
Criteria 4: The indicator can be determined without calculations which require input assumptions.			
Criteria 5: The complexity of the MRV is manageable.			
Criteria 6: The indicator can be monitored with own information and data.			
Criteria 7: The indicator should relate to specific targets of the SDGs.			
Criteria 8: The indicator directly relates to national legislation or international treaties.			

Indicator 9 + 10: Education - *Additional number of teachers/trainers trained* and *Total number of community members who are expected to have improved skills and/or knowledge resulting from training provided as part of project activities*

Table 29: Proposed indicator definition and specification

	Simple - Training	**Complex - Training**	
Indicator	Additional number of teachers/trainers trained	Additional number of skilled workers trained and employed under the project activity[28]	
Data Unit	*Intentionally left blank since the indicator is not deemed applicable at the project level*	Number of full-time equivalent skilled workers who were trained under the project activity	
Description		Skilled labour refers to labour that requires workers who have specialized training or a learned skill-set to perform the work. In a project context these will mainly be blue-collar workers, who can have varied levels of training or education. The indicator additionally includes employment under the action to secure that the trained skill is relevant and beneficial for the person trained.	
SDG relation (target)		SDG 4.4: By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship	
Measurement procedures and source of data		Sources for data are the employment data base of the project and official documentation from staff trainings. **Direct measuring** (specific, absolute, improvement): Number of skilled workers trained and employed under the project activity	
Baseline and target value (if, direct impact objective of the project)		Baseline: • Number of people employed who participated in training activities under the project: 0	Target: • Number of people employed who participated in training activities under the

[28] Indicator name has been tweaked to be more meaningful

		Collect information on people's skills prior to the project activity to ensure that skill was acquired through the project training and not before.	project: x number of people
Monitoring frequency		Annual reporting of measured values. To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and be continuously operated throughout the lifetime of the project.	
Verification and QC and QA procedures		QC: To ensure the accuracy of the data collection, the reported information should be compared to collected data from personnel records to also ensure the additionality of the skill acquired. QA: Check the consistency of the monitored data with data records from previous monitoring intervals, internal double-checks are carried out. External Verification: External verification can take place in form of site visits and interviews of personnel who was trained under the project activity.	
Comments			

Table 30: Assessment against criteria for effective indicators

Criteria	Simple indicator	Complex indicator
Criteria 1: The indicator refers to a specific individual outcome.		
Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.		
Criteria 3: The indicator is a quantitative metric.		
Criteria 4: The indicator can be determined without calculations which require input assumptions.		
Criteria 5: The complexity of the MRV is manageable.		
Criteria 6: The indicator can be monitored with own information and data.		
Criteria 7: The indicator should relate to specific targets of the SDGs.		
Criteria 8: The indicator directly relates to national legislation or international treaties.		

Indicator 11 + 12: Balance of Payment - *New capacity added – renewable energy* and *Reduction in fossil fuel imports*

Table 31: Proposed indicator definition and specification

	Simple – Renewable Energy	Complex – Renewable Energy
Indicator	New capacity added – renewable energy	Reduction in fossil fuel imports
Data Unit	MW of new capacity added	MWh produced Value of imported fossil fuel avoided (USD)
Description	New capacity of renewable energy added under the project activities Renewable energy is defined as energy generated from natural resources which are either available with no time limit or replenish more quickly than the rate at which they are consumed, including bioenergy, geothermal, hydropower, marine, solar and wind energy. The indicator does not cover thermal capacity but includes both on-grid and off-grid power capacity.	Reduction in fossil fuel imports linked to the project
SDG relation (target)	SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix	SDG 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix
Measurement procedures and source of data	Direct measuring (specific, absolute, improvement): New renewable energy capacity added • MW of renewable energy capacity added	Direct measuring (specific, absolute, improvement): Reduction in fossil fuel imports • MWh generated by added renewable energy capacity • assumption on the rate at which RE generation offsets the need for fossil fuel imports • Cost of fossil fuel imports

			• Value of imported fossil fuel avoided (USD)	
Baseline and target value	*Direct measuring*:		*Direct measuring*:	
	Baseline: • MW of renewable energy capacity added: 0	Target: • MW of renewable energy capacity added: x MW	Baseline: • MWh produced by added renewable energy capacity: 0 • Ex-ante fossil fuel price • Value of imported fossil fuel avoided: 0 USD	Target: • MWh produced by added renewable energy capacity: x MWh • Ex-ante fossil fuel price • Value of imported fossil fuel avoided: x USD
Monitoring frequency	Monitoring required on an annual basis To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and be continuously operated throughout the lifetime of the project		Monitoring required on a monthly basis To ensure an accurate and comprehensive assessment, MRV and data collection should begin at the start of the project implementation and continuously operated throughout the lifetime of the project	
Verification and QC and QA procedures	QC: Cross check measurement results with records for sold electricity. QA: The data and information provided by the project proponent should be checked internally through a review and cross check with official data of installed capacity from the grid operator the project is connected to ensure the accuracy and completeness of data. External Verification: Should include a desk review of the monitoring record (reports); spot check should be performed to verify the operation of the renewable energy plants.		QC: For indirect measurements national data is required For the direct measurement the energy amount produced by the project needs to be recorded. Monitoring equipment should comprise of two energy meters, one main meter and another check meter. The energy content of this amount will then be multiplied by the ex-ante fossil fuel price. QA: For data QA, the data and information provided by the project proponent should be checked internally through a review by a person not involved in the data collection and processing to ensure the accuracy and completeness of data. In case of errors, corrective action will be applied to avoid future similar mistakes. For data quality assurance the reviewer should review and check: a) the accuracy, completeness, and consistency of all monitored data; b)	

		collected data to verify that each project activity has been implemented and is performing as expected c) ensure data have been properly entered into data templates, forms, or software; External Verification: Should include a desk review of the monitoring record (reports); verification of the baseline for indirect measures
Further comments		

Table 33: Assessment against criteria for effective indicators

Criteria	Simple indicator	Complex indicator
Criteria 1: The indicator refers to a specific individual outcome.		
Criteria 2: The indicator establishes a direct and inherently clear cause-and-effect relationship between the activity and the impact.		
Criteria 3: The indicator is a quantitative metric.		
Criteria 4: The indicator can be determined without calculations which require input assumptions.		
Criteria 5: The complexity of the MRV is manageable.		
Criteria 6: The indicator can be monitored with own information and data.		
Criteria 7: The indicator should relate to specific targets of the SDGs.		
Criteria 8: The indicator directly relates to national legislation or international treaties.		