

Assessment Guidelines

Version 0.2 | October 2020



ASSESSMENT GUIDELINES

VERSION 0.2 | OCTOBER 2020

About this version

LandScale version 0.2 incorporates feedback received on version 0.1 during the first public consultation period and field-testing from August to October 2019. Responses and key changes to version 0.1 are available in a [summary of the version 0.1 public comments](#).

Version 0.2 will have a piloting phase conducted in more than 10 landscapes around the world and is [open for public comment](#) until December 1, 2020. The pilots' experience and input, as well as feedback from the second public consultation, will be incorporated into version 1.0, available in 2021.

Version 0.2 includes the following resources:

- [LandScale overview](#): a brief description of what LandScale is, how it works, who can use it, and where it is being piloted
- [Summary of the assessment framework](#): a brief description of the assessment framework including pillars, goals, and indicators
- [Assessment Framework](#): goals, indicators, and performance metrics that constitute the scope of an assessment
- [Assessment Guidelines](#) (this document): detailed guidance on the process of conducting a LandScale assessment
- [Verification Mechanism](#): the system for evaluating adherence to the LandScale guidelines and verifying the reliability of assessment results
- [Claims Guidelines](#): information on the type of claims that may be made based on LandScale assessment results and the process for communicating such claims
- Supplementary resources including:
 - [Annex 1. Sustainable Landscape Partnership Module](#)
 - [Annex 2. World Ecosystem Map and IUCN Typography](#)
 - [Annex 3. Human Rights Assessment Guidance](#)
 - [Annex 4. Human Rights Enabling Conditions](#)
 - [Annex 5. Terms & Definitions](#)
 - [Annex 6. Restoration Typology](#)
 - [Various appendices](#)

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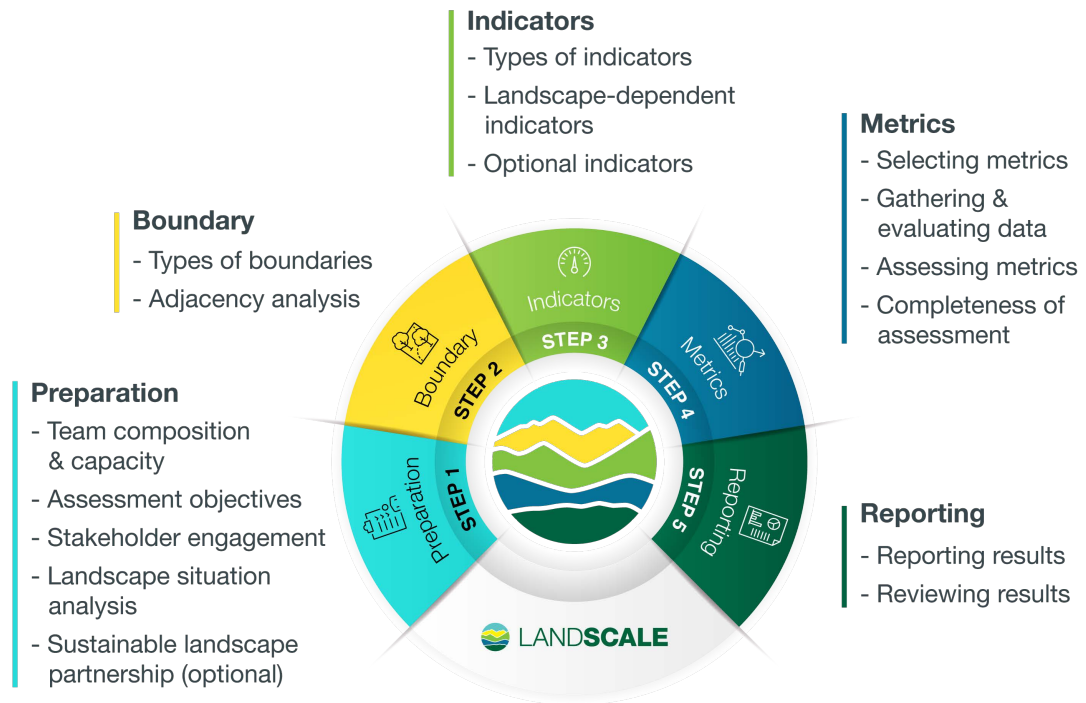
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Introduction

These guidelines help users conduct LandScale assessments in a pragmatic and cost-effective way. Based on field testing, the entire process is expected to take two to three months, with approximately 40-60 person-days of effort.

Figure 1. Overview of the Assessment Guidelines



The five steps of the assessment process are summarized below and elaborated fully in the five sections of this document:

- **Step 1: preparation**

This step includes the initial work of selecting and composing a LandScale assessment team, taking stock of the landscape context, and using this information to conduct initial scoping of the assessment. This step also includes the option of documenting progress toward establishing and implementing a sustainable landscape partnership.

- Step 2: boundary selection

Following LandScale guidelines, the assessment team defines the area for which the assessment will be conducted.

- Step 3: indicator selection

Based on the landscape context and user interests, the assessment team defines the topical scope of the assessment by selecting which landscape-dependent and optional indicators to include.

- Step 4: metric selection

Once indicators have been selected, the assessment team selects one or more metrics for each indicator. These metrics are then assessed using data that meet LandScale quality criteria.

- Step 5: reporting results

Assessment results are synthesized and uploaded to the LandScale reporting platform. At this point, a completeness check and quality assurance of the assessment results (optional) may be carried out, as specified in the [Verification Mechanism](#).

While the five steps are generally sequential, users may find it useful to approach steps 2 through 4 iteratively. For instance, information on data availability may require revisiting earlier decisions about indicator selection, and possibly even the landscape boundary.

Insights from field-testing of LandScale version 0.1 are highlighted in boxes throughout the guidelines to illustrate in practice many of the actions required. Supporting resources are also available in the form of [annexes and appendices](#), which provide more detailed information on some of the steps.

LandScale provides a standard reporting template for version 0.2 (currently only available to LandScale pilots) where the outputs of all steps can be documented. It includes detailed guidance and instructions for reporting on each step of the assessment process. For LandScale version 1.0, the reporting template will be incorporated into the reporting platform, where content will be automatically aggregated into a standardized report.

STEP 1

Preparation



1 Preparation

This section provides guidance on the preparation step, which starts by constituting an assessment team with the necessary expertise, knowledge, and skills to carry out a successful assessment. The section continues with guidance on documenting the assessment objectives, engaging with stakeholders, and determining the frequency interval for repeat LandScale assessments. Step 1 is also supported by two annexes; the LandScale situation analysis (LSA) and the sustainable landscape partnership (SLP) module. The LSA, which is required, provides a structured format to document essential landscape characteristics as the context for the assessment. The SLP, which is optional, allows the documentation of key elements of a multi-stakeholder initiative.

1.1 Assessment Team Composition and Capacity

The LandScale *assessor* is defined as the entity or team that conducts a LandScale assessment. This may be an organization or team composed of NGOs, consultancies, research institutions, and other entities with locally relevant expertise on the assessment scope. Whether a single organization or a partnership undertakes the assessment, a team effort is needed.

An assessment team requires the following types of expertise:

- Technical knowledge of sustainability

Assessors need to be able to access technical expertise in all sustainability themes covered by the four pillars of the assessment framework. This includes interdisciplinary expertise in issues related to land use, natural resource management, commodity production, social development, human rights, and governance, as well as agriculture or forestry if these are significant sectors in the landscape.

For the human well-being and governance pillars, the assessment team must have social expertise. If possible, the team should include a human rights impact assessment expert from a local or international organization as a team member or external advisor to help ensure adherence to internationally accepted approaches related to human rights. The team should include, at a minimum, capable and neutral local expert(s) that leads the assessment of the social indicators. The person or team selected for this role should meet the criteria below, which are considered essential for building trust and ensuring that local stakeholders are comfortable sharing information:

- Speak the local language

- Be committed to an objective and inclusive assessment, including willingness to engage separately with marginalized or vulnerable groups to the extent necessary to properly understand their perspectives
 - Understand the key social issues affecting local people and communities
 - Have knowledge and experience related to human rights issues and impact assessments
 - Have experience conducting household surveys, interviews, focus groups, and other types of engagements with local communities
 - Have a general understanding and knowledge of local culture, context, and politics
- Data and analysis expertise

The team should include expertise in social and environmental data and data analysis so that it will be able to identify data sources, assess data quality, and calculate metrics based on secondary and possibly primary data. In addition to broad expertise with sustainability data, it is also helpful to have expertise related to each LandScale pillar. Skills in geographic information systems (GIS) analysis are also valuable.

The assessment team may wish to extend its own capacity related to data by engaging with other organizations, experts, or landscape stakeholders, for instance in the following ways:

- Provide access to data

Where data exists but is not publicly available, data partners can grant or facilitate access to such data (see steps 4 and 5 for more information). Direct personal engagement may be useful to build trust and communicate the benefits of sharing data for a better assessment result.
- Support data collection

In cases where appropriate secondary data sources cannot be identified or accessed, the assessment team may wish to partner with other organizations to help collect primary data. For instance, a partner could conduct or support the collection of biodiversity data to address indicators and metrics in LandScale pillar 1.

1.2 Documenting the Assessment Objectives

Documentation of the assessment objectives (or the reasons for conducting a LandScale assessment) provides important context for those interested in the results. These objectives are often developed in the context of landscape goals (see below) and

via stakeholder engagement (see section 1.3). Assessment objectives will inform the remaining steps, beginning with the landscape boundary selection. The objectives or reasons for conducting an assessment can be documented in the version 0.2 reporting template.

1.2.1 Goals and targets

LandScale users are encouraged but not required to document any existing landscape sustainability goals, targets, and milestones, and to align these with the structure of the LandScale assessment framework. Goals, targets, and milestones may be those set by multi-stakeholder initiatives in the landscape or by other parties.

Goals are overarching statements about the ultimate desired results for sustainability within the landscape. Targets are more specific performance outcomes that quantify and provide detail on intended results, for instance at the level of individual metrics in the LandScale assessment framework. Targets may be quantitative or qualitative. Milestones specify interim results toward targets at specific points in time. LandScale version 0.2 does not include guidelines for developing landscape goals, targets, and milestones; however, there are many existing resources available to help guide this process.

To the extent that there are existing goals, targets, and milestones for the landscape that align with the LandScale assessment framework, assessors are encouraged to evaluate and report performance in relation to these benchmarks as part of each assessment. If there are existing goals, targets, and milestones for the landscape that do not align with the LandScale assessment framework, the user is encouraged to engage with the owner(s) of these goals to strengthen alignment with the assessment framework so that LandScale can serve as an effective tool to monitor and report against the landscape's objectives.

1.3 Stakeholder Engagement

Throughout the application of LandScale, input from local stakeholders can help ensure that the assessment is accurate and reflects stakeholders' interests and needs. Stakeholder engagement is required only for the assessment of human rights indicators (goal 2.2 in steps 3 and 4). However, LandScale recommends ongoing engagement with key landscape stakeholders through every step of the assessment guidelines. Stakeholder engagement should be reported in the assessment results (step 5). A reporting template for doing so is provided for the organizations piloting version 0.2.

It is recommended that before starting the assessment, the assessor develops a plan for stakeholder engagement at each stage of the assessment process where this is deemed useful or necessary. This includes; landscape boundary selection, indicator selection, metric selection, data procurement, and review and interpretation of assessment results.

Recommendations on when and how to obtain stakeholder input are provided in boxes situated at the end of the guidelines for each step.

1.4 Determining When to Conduct a Repeat Assessment

After a first assessment has been conducted in a given landscape, LandScale recommends updating the assessment at least once every three years. This periodicity helps to ensure sufficiently current information and detect important trends. When assessments are used to justify claims about landscape status or trends (see [Claims Guidelines](#)), they should be updated to use the most recent available data for the relevant indicators.

1.5 Landscape Situation Analysis (LSA)

The LSA provides a structured format to assist the assessor in characterizing the landscape and understanding internal and external factors that affect, and are affected by, landscape sustainability. It is a tool to capture and synthesize additional contextual information about the landscape and inform decisions about assessment objectives and relevant indicators. The LSA is also the place to specify which economic activities the assessment will cover. The scope of economic activities will inform the breadth of sectors that will be assessed for specific indicators¹.

The LSA should be informed by the assessor's understanding of the landscape context and supplemented by information from desk-based research and interviews with key stakeholders. The assessor should aim to collect the data in each of the LSA categories to get a holistic picture of the current landscape context, which will provide context for readers of the assessment report. The LSA is also integrated into the version of a 0.2 reporting template for LandScale Pilots to facilitate its completion and other assessment requirements. The assessor should complete the LSA at the start of the first LandScale assessment and revisit it in repeated assessments to update information that has changed.

1.6 Sustainable Landscape Partnership (SLP) Module

The SLP module is an optional component of LandScale that supports multi-stakeholder groups to document their activities and progress related to integrated landscape management in a structured manner. The module includes five elements: structure and governance of the partnership, stakeholder engagement, sustainability goals, action plans, and monitoring and evaluation. The module can help actors involved in, or considering engaging with, a sustainable landscape partnership to understand the progress in establishing the partnership, how it functions and what it has achieved, as

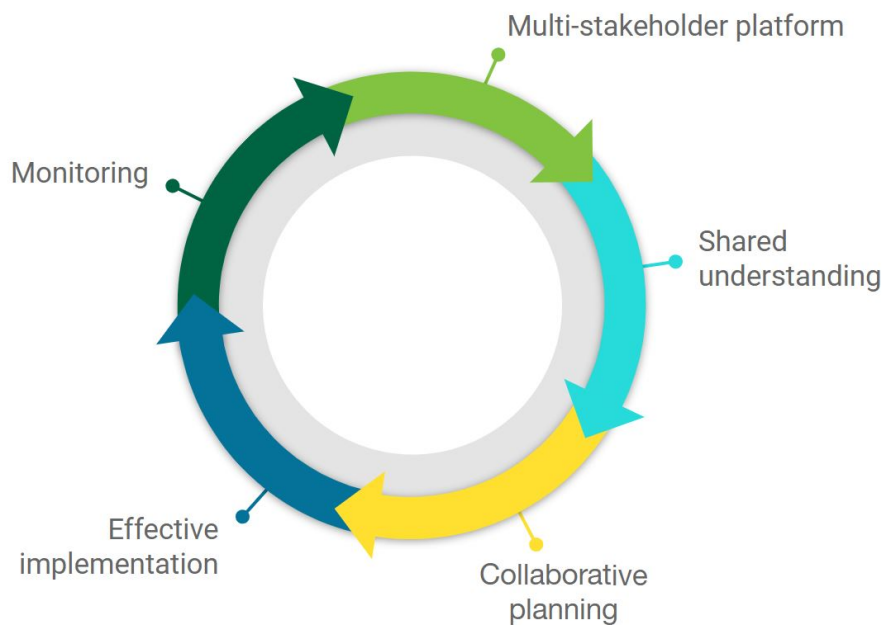
¹ The scope of economic activities is only relevant for the indicators in goals 2.2, 3.2, and 4.1. The rest of the indicators will be assessed regardless of the economic activities of interest.

well as helping to identify aspects that may warrant further attention. This information can be integrated into the LandScale assessment report to provide valuable context for interpreting LandScale assessment results. It may also increase interest in the landscape and the partnership, and boost confidence by buyers and investors in sourcing from or funding activities in the landscape.

The module is designed to be applied in a participatory manner to generate information that is reflective of the entire partnership and its work. LandScale recognizes that landscape initiatives take different forms and that there is no “one-size-fits-all” when it comes to their design and implementation. Therefore, the module does not include required thresholds for progress or achievements, and it may be used in part or in full. The module is not designed as a comprehensive guide to support the development of a sustainable landscape partnership. However, a list of resources that may help develop and implement sustainable landscape partnerships is provided in the Pillar Resources.²

Box 1. Pilot experience: LandScale’s Role in the Landscape Management Cycle

LandScale can be applied to landscapes in different stages of the landscape management cycle and where different elements of a landscape partnership are present (see figure below³).



² The Pillar Resources document is currently being evaluated and co-developed with LandScale pilots. It will be made available to all LandScale users as part of version 1.0.

³ The figure shows the five elements of integrated landscape management from the “The Little Sustainable Landscapes Book”: WWF, EcoAgriculture Partners, The Nature Conservancy, IDH The Sustainable Trade Initiative, & The Global Canopy Programme. (2015). *The Little Sustainable Landscapes Book*. Global Canopy.

For example, the pilot landscape in Guatemala is using LandScale to engage stakeholders and develop a shared understanding of the issues, whereas the pilot landscape in Ghana is using LandScale to monitor and communicate the impact of multi-stakeholder actions and interventions.

Building stakeholder engagement and a shared understanding: In the context of the LandScale pilot on the Southern Coast of Guatemala, the stakeholders identified the contamination and exploitation of natural resources as a common challenge that requires their collaborative action. Yet there was no shared understanding or agreement on what interventions were needed or the scale at which those should be deployed. To address this, the partners conducting the pilot assessment (Rainforest Alliance and Solidaridad), used LandScale as an organizing framework to identify common goals among the key stakeholders and create a shared action plan for the landscape. The process involved engaging with key stakeholders to understand their needs and challenges, and to shape these into a shared vision, goals, and targets for the landscape. An accompanying action plan for integrated management of the landscape outlines how these goals and targets can be pursued. The goals and targets were aligned to the indicators and performance metrics of the LandScale assessment framework to ensure they were quantifiable and measurable.

Monitoring impact: In the context of the LandScale pilots in Ghana, a shared vision was already in place when the assessment was conducted. The pilots are located in the Kakum and Juabeso-Bia Hotspot Intervention Areas (HIAs), which are priority areas for coordinated interventions at farm and landscape level to address the country's high deforestation rate, which threatens cocoa production. A formal multi-stakeholder platform, with representatives from government agencies, the private sector and civil society, is working with community-based governance bodies to develop a management plan for each HIA. LandScale is being used to measure the impact of the stakeholders' coordinated action and drive further improvement, demonstrating fulfillment of commitments to curtail deforestation under the Cocoa and Forests Initiative.

Box 2. Recommended Stakeholder Input for Step 1

Before starting a LandScale assessment, it is recommended that the assessor raises awareness about the assessment among relevant stakeholders, including any local landscape partnerships as well as partners who the assessment team might want to engage to help collect or access data.

During the initial engagement, the assessor could ensure that stakeholders:

- Understand the objectives for conducting a LandScale assessment;
- Understand what LandScale is, what the assessment process entails, and their opportunities for input and participation in the assessment;

- Are willing to contribute to the assessment by providing data or feedback.

While the methods to raise awareness and secure support from stakeholders will vary, based on the LandScale pilots' experience, we recommend using existing landscape partnership platforms or other multi-stakeholder spaces, leveraging communication channels (e.g., local TV and newspapers as well as social media), and holding meetings and workshops with stakeholders. Representatives from the public sector, local communities, private sector, and civil society should all be included.

1.7 Outputs of Step 1

The required and recommended outputs for step 1 are listed below. For the organizations piloting LandScale version 0.2, these outputs may be documented in the reporting template provided.

Required:

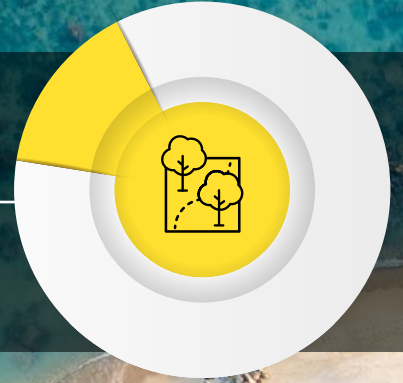
- Assessment team composition and brief description of how the team fulfills the qualifications
- LSA
- Objectives of the LandScale assessment
- Date of the last LandScale assessment for the landscape (for repeat assessments only)

Recommended:

- SLP report

STEP 2

Boundary Selection



2 Boundary Selection

This section guides the assessor through the process of defining an appropriate area for which to conduct the assessment. It explains the three options for defining the landscape boundary and the requirements associated with each.

2.1 Types of Boundaries

Once users have identified a general area of interest to apply LandScale, the next step is to define a precise boundary for which the LandScale assessment will be conducted. The boundary should be relevant to landscape-level sustainability issues and to the actors who are expected to use the assessment results. Getting the boundary right is essential because it informs all further assessment steps, including the selection of indicators and metrics and the data collected to measure them.

2.1.1 What size should the landscape be?

An appropriate area for applying LandScale is typically in the order of hundreds to thousands of square kilometers. The area needs to be large enough for the assessment to capture key interdependencies between sustainability dimensions -- including ecosystems, human well-being, governance, and production -- but small enough to provide meaningful insights at a scale that can inform specific actions to improve sustainability. Users should generally seek a "sweet spot," where the assessment is able to provide a broad view of landscape-level performance, trends, and impacts without far exceeding the bounds of where the LandScale user and landscape stakeholders are able to manage for or influence change.

2.1.2 What kinds of areas should be included within the landscape?

LandScale is most applicable for areas dominated by rural land uses and natural resource-based economies and supply chains. If LandScale is applied in landscapes where urban areas comprise a major portion of the land use, many of the indicators may be skewed to reflect conditions in these urban areas. Therefore, users are encouraged to define landscapes that consist predominantly of rural lands and the small population centers that are embedded within or directly associated with these lands and economic activities.

2.1.3 How should the boundary be delineated?

There are three options for delineating the landscape boundary:

1. Jurisdiction
2. Catchment

3. User-defined landscape delineated based on context-relevant considerations such as company sourcing areas, investment or project areas, ecoregions, or other geographic parameters of interest to LandScale users

Because the boundaries of single jurisdictions and catchments are pre-defined and generally already accepted as land management units, they can be used without restrictions and without the need for further justification. However, an explanation for their selection is recommended. A user-defined boundary, however, must follow the guidelines below to help ensure consistency of LandScale's application and to account for key interactions and potential impacts in the areas that border the landscape.

When defining the landscape boundary, the assessor is encouraged to consider the availability of data for different potential delineations of the landscape. For instance, official government data and other statistical data tend to be more available for jurisdictions than for catchments or other types of delineations. Water quality and flow information may be more available for catchment delineations. User-defined landscapes are likely to present the greatest challenges to data availability, particularly when such landscapes are not composed of multiple jurisdictions. Therefore, assessors are encouraged to review the requirements and process for steps 3 and 4 before finalizing the landscape boundary selection.

2.1.3.1 Option 1: jurisdiction

A jurisdiction is a political-administrative unit in which government authority is exercised. A jurisdictional boundary for an assessment should generally match the optimal landscape size for LandScale assessments: approximately hundreds to thousands of square kilometers. In most countries, this will correspond to a second or third-level jurisdiction such as a municipality, district, county, or canton.⁴ If a proposed landscape is comprised of a subset of the third-level jurisdictions that make up the second-level jurisdiction, then it is considered a user-defined landscape boundary and must be rationalized according to the guidelines for user-defined landscapes below⁵. Similarly, if a proposed landscape includes more than one second-level jurisdiction (e.g., four adjacent states), then it is also considered a user-defined landscape boundary.

The use of jurisdictions as the landscape boundary can facilitate collaboration with government bodies operating within the jurisdiction. Assessments can provide jurisdictional approaches with information to monitor impact, support management, and attract investment. Furthermore, publicly available datasets relevant for LandScale

⁴ Note that the terms used for second and third-level jurisdictions as well as the corresponding size vary from country to country. For example, municipalities in Brazil are generally many times larger than cantons in Costa Rica, even though both are second-level jurisdictions.

⁵ The rationale behind this is that if the landscape boundary exceeds more than one jurisdiction then it is no longer based on a pre-established and single administrative boundary. Therefore, the boundary selection becomes a subjective decision that needs to be analyzed further to ensure that it accounts for key sustainability interactions.

indicators and metrics – particularly related to socio-economic variables – often report data at the level of jurisdictions and thus may facilitate assessments.

2.1.3.2 Option 2: catchment

A catchment (also known as a drainage basin or watershed) is the area of land from which all precipitation flows to a common outlet. Similar to jurisdictions, a catchment boundary for a LandScale assessment should generally match the optimal landscape size for LandScale assessments: approximately hundreds to thousands of square kilometers. Depending on the region, this could include catchments or sub-catchments.

A catchment boundary may be particularly appropriate for LandScale users reliant on water such as agricultural producers, extractives industries, government water authorities, or hydroelectric power suppliers. If a landscape is made up of more than one watershed or sub-watersheds, then it is considered a user-defined landscape and must be rationalized according to the guidelines below.

2.1.3.3 Option 3: user-defined landscapes

Because landscapes can be defined by multiple ecological, political, historical, economic, and socio-cultural dimensions, LandScale permits users to define landscapes according to locally relevant combinations of these parameters.

User-defined landscapes may be appropriate for a variety of LandScale users that wish to assess sustainability performance over areas that do not correspond to jurisdictional or catchment boundaries. Examples include companies using LandScale to assess sustainability performance in their sourcing areas; governments, donors or lenders using LandScale to assess areas affected by large-scale infrastructure projects; or companies or investors aiming to conduct risk assessment in a specific area of interest.

To ensure that LandScale assessments include a sufficiently broad scope of sustainability issues, the user-defined landscape boundary should encompass the most significant environmental, social, and economic features (and corresponding land uses) that influence, or are impacted by, such activities. These may include, for example, protected areas, critical conservation values, major water bodies, human settlements, or major production areas and processing facilities. To help ensure that this is the case, if a user-defined boundary is proposed, an *adjacency analysis* must be completed as described below.

2.2 Adjacency Analysis

When setting a user-defined landscape boundary an adjacency analysis is required to help ensure that the selected assessment area will accurately capture key aspects of landscape performance and effectively inform landscape management decisions. More specifically, the adjacency analysis helps a) ensure the assessment boundary is defined to include key areas impacted by activities in the landscape, b) determine if the assessment boundary matches the boundary relevant for landscape management and

action, and c) prevent exclusion of relevant adjacent areas with sustainability challenges, such as degraded natural areas or farmworker communities experiencing high poverty.

The adjacency analysis includes three steps: a) analyzing adjacencies relative to the initial proposal for a user-defined landscape; b) making boundary adjustments, if and as needed; and c) documenting the decisions made. These steps are described further below. Generally, the adjacency analysis can be carried out based on desk analyses and input from stakeholders and subject matter experts, solicited either individually or in a workshop setting. See box 3 for an example of how a LandScale pilot conducted the adjacency analysis.

2.2.1 Analyze adjacencies

The assessor should analyze adjacencies and other ramifications of the initially proposed landscape boundary for an area extending at least 10km from the proposed boundary. A first step is to collect information on land uses and other major features (e.g., protected areas, human settlements, major production or processing sites, or others) within the adjacent areas. The assessor should then analyze the relationship between the proposed user-defined landscape boundary and this adjacent boundary in the following ways:

- **Impacts on the adjacent area:** Identify the actual or potential impacts of activities within the proposed user-defined landscape on the adjacent area. This could include, for instance, pollution, or runoff, or major employers in the landscape whose employees live predominantly in the adjacent area. If significant impacts on the adjacent area are identified or predicted, then the user-defined landscape boundary should generally be expanded to include the affected areas.
- **Impacts from the adjacent areas:** Identify the actual and potential impacts of activities or features in the adjacent area on the proposed user-defined landscape. This could include, for instance, major infrastructure or mineral or hydrocarbon extraction sites in the adjacent areas. If features in the adjacent areas are expected to significantly affect the proposed user-defined landscape, then the assessor should consider including these features or areas within the landscape boundary. However, this is not obligatory in all instances: for instance an adjacent city could have impacts on the nearby outlying landscape, but the assessor may wish to exclude the city so as to ensure that the assessment reflects the outlying rural area of interest to the LandScale user.
- **Sensitive resources within the adjacent areas:** Identify sensitive resources in the adjacent area. Ecologically sensitive resources include High Conservation Value (HCVs), fragile ecosystems, and habitats for endangered species. Socially sensitive areas may include indigenous territories or populations, areas of high poverty, and cultural heritage areas. If activities in the proposed user-defined

landscape affect these resources - and especially if they pose risks of negative impacts to them, then the landscape boundary should be expanded to include the areas containing these sensitive resources. Additionally, if exclusion of adjacent areas would tend to exclude marginalized or vulnerable groups whose livelihoods or well-being is tied to the proposed landscape (e.g., indigenous peoples, permanent or migrant farm workers, ethnic minorities, or populations with high levels of poverty), then the assessor should consider expanding the boundary to include such populations.

- **Contiguity:** Determine whether the user-defined landscape is drawn in a way that creates spatial discontinuities, such as gaps, holes, or “fingers” of excluded land surrounded on two or three sides by included land. Generally, unless there is a good rationale for doing so, landscape boundaries should not be highly contorted or irregular.
- **Trends or predicted future changes:** Identify any trends or future predictions that may require a larger landscape delineation to effectively capture or monitor. For instance, if agricultural areas within the proposed user-defined landscape are expanding outward toward undeveloped lands in the adjacent areas, then a larger boundary would generally be appropriate to enable the monitoring of agricultural expansion over time. The final boundary should be one that is expected to remain valid for a decade or more so that follow-on LandScale assessments may be conducted without having to change the boundary.

2.2.2 Adjust the boundary if and as needed

If the analyses and considerations outlined in the prior step reveal the need to expand the initial user-defined landscape boundary, then the assessor should develop a revised boundary that is expanded in a way that addresses these considerations.

2.2.3 Document the results of the analysis

The final step is to document the findings and outcomes of the adjacency analysis, whether it resulted in adjustments to the initial user-defined landscape boundary.

If changes were made to the user-defined landscape boundary as a result of the adjacency analysis, then the assessor should provide maps of both the initial and the revised boundary and explain the reasons for the changes. If no changes were made, then the assessor should document the findings of the adjacency analysis that support retaining the original boundary. Under either scenario, if one or more of the considerations in step (a) suggest a possible need to expand the boundary but the assessor elected not to do so, then the assessor should document the reasons for this decision.

Box 3. Pilot experience: Conducting an Adjacency Analysis for a Multi-Jurisdictional Landscape

In the Peru LandScale pilot, an adjacency analysis helped the assessment team realize the need to include additional districts within the user-defined landscape boundary. The “Mancomunidad Bajo Mayo” is a landscape in Lamas, Peru, whose partners aim to stop and reverse the expansion of agriculture that has resulted in deforestation and loss of biodiversity and ecosystem services, which in turn reduced productivity of current agriculture. To do this, the Rainforest Alliance is convening a multi-stakeholder partnership in this landscape to tackle these challenges and develop a rural economy that creates long-term prosperity.

Given the focus on deforestation and loss of ecosystem services, the Rainforest Alliance began to work with municipal governors in four municipalities adjacent to the Cordillera Escalera Conservation Area. This Conservation Area is the source of the majority of the water and ecosystem services in the area and is vulnerable to the expansion of agricultural production that threaten its ecosystems. Additionally, partners in the landscape, such as the agricultural Cooperative Oro Verde, Grupo Palma (agricultural product wholesaler), and the Regional Department of Agriculture had committed to provide data and information to support the assessment. They defined the landscape based on jurisdictional boundaries to facilitate data availability and because of the commitment of local district mayors to participate in the project. The original boundary included the four districts that comprise the Mancomunidad Bajo Mayo: Pinto Recodo, Alonso de Alvarado, Lamas, and Tabalosos.

Since a multi-jurisdiction boundary is considered a user-defined landscape, the assessment team was required to carry out an adjacency analysis. This process helped them realize that it was necessary to expand the landscape to include two additional districts: San Roque de Cumbaza and Shanao. The analysis showed that the largest portion of the Cordillera Escalera Regional Conservation Area (75%) is within the San Roque de Cumbaza district. The team realized this district would need to be included in order to successfully monitor the encroachment of agriculture into the conservation area, and any associated impacts on ecosystem services. The adjacency analysis also revealed the need to include the Shanao district, which is located between the districts of Lamas and Tabalosos, to create a user-defined landscape with sufficient continuity.

Box 4. Recommended Stakeholder Input for Step 2

If the assessment team chooses a user-defined landscape boundary, it is recommended to get feedback from key stakeholders on the justification for the landscape boundary selected and on the adjacency analysis. This feedback is especially useful for ensuring that the boundary does not exclude key areas or miss key interdependencies.

Input may be collected as part of already-planned stakeholder meetings or ongoing multi-stakeholder processes, or it may be solicited through bilateral or small group interviews with key stakeholders. Where there is an existing SLP, this group may be approached to seek input from its members and their partners, thus facilitating broader consultation while saving the assessor work.

2.3 Outputs of Step 2

The required and recommended outputs for step 2 are listed below. For the organizations piloting LandScale version 0.2, these outputs may be documented in the reporting template provided.

Required:

- For any of the three boundary options:
 - Landscape boundary in .shp or .kml format
 - Size of landscape (in square km)
 - Brief narrative rationale for the proposed landscape boundary
- If a user-defined landscape is proposed:
 - Explanation of why a user-defined landscape is proposed
 - Documentation of the adjacency analysis and its conclusion, including:
 - Summary of adjacent land uses (maps suggested)
 - Findings related to at least the five criteria for the adjacency analysis
 - Conclusion of the analysis, including documentation of the results

Recommended:

- Documentation of stakeholder consultation conducted as part of the process of delineating a user-defined landscape

STEP 3

Indicator Selection



3 Indicator Selection

With the landscape boundary set, LandScale users can proceed with determining which indicators to include in the assessment. This section introduces the LandScale indicator categories and the requirements for their selection. By the end of this step, the assessor will be able to determine the indicators that are required to be assessed and the optional indicators that are relevant for the selected landscape.

3.1 Types of Indicators

LandScale indicators are divided into three categories: core, landscape-dependent, and optional (see table 1 for definitions). All core indicators are mandatory to consider for any LandScale assessment. Every landscape-dependent indicator is mandatory to consider unless the assessor demonstrates that it is not relevant to the given landscape. A core or landscape-dependent indicator should not be excluded from consideration due to a lack of data or capacity to assess it. However, the evaluation of a certain proportion of such indicators may be deferred according to the allowances specified in the completeness of assessment section.

The inclusion of optional indicators is at the discretion of the LandScale user. The user may also choose to include landscape-dependent indicators even if they are not determined to be required according to the selection process outlined below. Users may wish to include non-mandatory indicators as the basis for making claims on the given topic, or for other reasons.

Table 1. Definitions of Core, Landscape-Dependent, and Optional Indicators

<p>Core</p> <p>Mandatory for all LandScale assessments</p>	<p>Deemed critical to landscape sustainability in all landscapes globally.</p>
<p>Landscape-dependent</p> <p>Mandatory in all contexts where relevant; optional in other contexts</p>	<p>Critical sustainability concerns or opportunities in the context of the given landscape where they are deemed applicable. The user may exclude landscape-dependent indicators that are not relevant to the landscape.</p>
<p>Optional</p>	<p>Topics that reflect LandScale users' own sustainable landscape objectives or that add information for issues of high importance to stakeholders.</p>

The designation of each LandScale indicator as core, landscape dependent, or optional is explained in [Appendix 2](#), table 2.

3.2 Selecting Landscape-Dependent Indicators

As previously noted, landscape-dependent indicators address measures of sustainability that are important in some landscapes but not others. LandScale assessors may include any such indicator without further analysis or justification if the need or desirability of their inclusion is evident. When the applicability is unknown or uncertain, the assessor should determine the applicability using the evaluation criteria for each indicator in table 3. Generally, these criteria are based on:

- **Existing status:** Are there existing and significant negative impacts related to this indicator (e.g., on ecosystem health or human well-being)? Or might the indicator reveal significant contributions to sustainability from ongoing actions or investments (e.g., restoration actions occurring or planned)?
- **Trends and drivers:** Do trends (e.g., increasing resource scarcity or competition) and drivers (e.g., market forces or government policy shifts) suggest the possible development of future risks or opportunities related to this indicator?

Table 3 provides examples of information sources that can support review of the above criteria, such as: a) reports, scientific papers, newspaper articles, or other published documents from credible institutions or authors, and b) input from local landscape stakeholders and recognized experts on the respective topic. Seeking input from stakeholders is especially important because their perspectives may offer insights on sustainability concerns or opportunities that are not documented in published materials or revealed by expert opinion.

There are three possible outcomes for the analysis of applicability for each landscape-dependent indicator:

- The indicator is determined to be applicable in the landscape. It should then be included in the LandScale assessment. While not required, a statement explaining rationale for inclusion is useful for readers of the assessment report.
- The determination of applicability is inconclusive due to ambiguous or insufficient information. To be conservative, the indicator should be included in the initial LandScale assessment. If the initial assessment establishes that the indicator is not applicable based on the relevant criteria stated in table 3 below, then it may be dropped as a requirement from subsequent assessments.
- The indicator is determined to be not applicable in the landscape. In this case, the assessor should provide documentation explaining why it is deemed not applicable based on the relevant criteria stated in table 3 below. Landscape-

dependent indicators that are determined not to be required may nevertheless be included voluntarily at the discretion of the LandScale user.

When conducting a repeat LandScale assessment, it is important to revisit decisions about landscape-dependent indicators that were previously deemed non-applicable. This is because conditions may have changed in the interim that now makes one or more applicable.⁶ However, a full re-assessment of applicability is not expected. Rather, for re-assessments, a brief statement explaining why any landscape-dependent indicators were determined to be inapplicable will suffice.

Regarding the landscape-dependent human rights indicators (2.2.1 through 2.2.4), LandScale recognizes that information for selecting and determining the applicability of relevant indicators is often not readily available or accessible at the landscape level. Therefore, LandScale provides a differentiated approach for selecting these indicators, which was developed in collaboration with several organizations that are expert in human rights and their assessment. Specifically, the process of selecting indicators for LandScale goal 2.2 (respect, protect, and fulfill human rights) is focused more heavily on stakeholder consultation and may also entail a higher level of desk-based research than for other landscape-dependent indicators. This process is elaborated in [Annex 3: Human Rights Assessment Process](#). Assessors should use this annex in combination with the criteria in table 3 to select indicators for goal 2.2.

⁶ For example, if restoration was not applicable previously because no restoration had been recently completed or planned, but now there are or will be restoration actions implemented.

Table 3. Criteria for Determining Applicability of Landscape-Dependent Indicators

For each indicator, criteria for inclusion (applicability), criteria for exclusion (non-applicability), and suggested information sources are provided.

Pillar 1: ecosystems	
1.1.5 Ecosystem restoration	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> ● Significant presence of restoration activities or restored land in the landscape, including: <ul style="list-style-type: none"> ○ Areas where restoration has been completed; and or ○ Areas where restoration activities are underway or are expected to be initiated by the time of the assessment report publication <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> ● No significant restoration actions have been occurring or are planned <p>Suggested information sources:</p> <ul style="list-style-type: none"> ● Government agencies, companies, NGOs, farmer associations, or others that conduct or support restoration

<p>1.3.1 Water quantity</p>	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> • Evidence of ongoing or seasonal water stress or vulnerability to water stress based on the water stress factor (see information sources below), stakeholder input, and information on threats to water sources <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> • The water stress factor is below 25% and water supply is not interrupted during the dry season; and • Key stakeholders (e.g., water suppliers and farmers relying on irrigation) indicate lack of water supply problems or concerns; and • Key water supply areas are protected from development and degradation <p>Suggested information sources:</p> <ul style="list-style-type: none"> • For water stress factor: Governmental water agency, FAO SDG indicator, WRI Aqueduct Water Stress and crop water stress, hydrological studies of catchment. The factor should be calculated for the landscape of interest (when the landscape boundary is based on jurisdictions or user-defined, the factor may be calculated for catchment[s] that include and approximate the LandScale assessment area). • For seasonal shortage of water: water suppliers, power companies and media coverage related to interruption of water services • Stakeholder input via workshops or targeted discussions or surveys
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<p>1.3.2 Water quality</p>	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> • Data on suspended solids in key water bodies suggests degraded water quality; or • Data on oxygen demand and nutrients suggest degraded water quality; or • The landscape contains potential major sources of water pollution, such as industrial operations that discharge wastewater, large-scale livestock operations, and large farming areas that contribute non-point source pollution. <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> • Existing reports on the quality of water analyzed in rivers or at the catchment area (before entering into a water treatment plant) shows levels of sediment, nutrients, pathogens, and metals in line with national or other thresholds (e.g. EPA) to sustain aquatic life, recreational activity and irrigation. <p>Suggested information sources:</p> <ul style="list-style-type: none"> • Government bodies, water suppliers, hydropower companies, academic institutions, NGOs.
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Pillar 2: human well-being

2.2.1 Child labor

Note: the criteria shown here should be used in combination with the process in Annex 3.

Criteria for applicability:

- Results from interviews with expert organizations and rights holders or rights holders' advocates determine there is presence of child labor in the landscape.
- Indication of incidence or likelihood of incidence of child labor based on government reports, assessments by NGOs or international organizations, newspapers and journals, and statements or reports from producer and/or community organizations.

Criteria for non-applicability:

- Experts' judgements point to no presence of child labor in the selected economic activities of the landscape.

Suggested information sources:

- **Events-based data:** Information on known or presumed human rights violations based on testimonies of victims and/or witnesses, information provided by the media, and reports by governments, companies, academia, civil society organizations, etc.
- **Socioeconomic and administrative statistics:** Statistical data on human populations, groups, or jurisdictions based on surveys, censuses, and similar methods.
- **Perception and opinion surveys:** Representative sample polls of individuals' personal views on a given issue.
- **Expert judgements:** Data generated through judgment-based assessments of human rights situations with a sample of informed experts.⁷

⁷ United Nations Human Rights Office of the High Commissioner. (2012). *Human Rights Indicators: A Guide to Measurement and Implementation*. OHCHR.

https://reliefweb.int/sites/reliefweb.int/files/resources/Human_rights_indicators_en.pdf

<p>2.2.2 Forced labor</p> <p>Note: the criteria shown here should be used in combination with the process in Annex 3.</p>	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> • Results from interviews with expert organizations and rights holders or rights holders' advocates determine there is presence of forced labor in the landscape. • Indication of incidence or likelihood of incidence of forced labor based on government reports, international organization assessments, local organizations' research, newspapers and journals, and producer and/or community organizations statements or reports. <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> • Experts' judgments point to no presence of forced labor in the selected economic activities of the landscape. <p>Suggested information sources:</p> <ul style="list-style-type: none"> • Same as for 2.2.1
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<p>2.2.3 Workers' rights</p> <p>Note: the criteria shown here should be used in combination with the process in Annex 3.</p>	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> • Results from interviews with expert organizations and rights holders or rights holders' advocates determine there is presence of workers' rights violations in the landscape. • Indication of incidence or likelihood of incidence of workers' rights violations based on government reports, international organization assessments, local organizations research, newspapers and journals, and producer and/or community organizations statements or reports. <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> • Experts' judgments point to no presence of workers' rights violations in the selected economic activities of the landscape. <p>Suggested information sources:</p> <ul style="list-style-type: none"> • Same as for 2.2.1
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<p>2.2.4 Other human rights</p> <p>Note: the criteria shown here should be used in combination with the process in Annex 3.</p>	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> ● Results from interviews with expert organizations and rights holders or rights holders' advocates determine there is presence of other human rights violations in the landscape. ● Incidence or likelihood of incidence of other human rights violations based on government reports, international organizations' assessments or research, newspapers and journals, and producer and/or community organizations' statements or reports. <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> ● Experts' judgments point to no presence of other human rights violations in the selected economic activities of the landscape. <p>Suggested information sources:</p> <ul style="list-style-type: none"> ● Same as for 2.2.1
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Pillar 3: governance

3.2.4 Illegality and corruption related to land and resources

Criteria for applicability:

- Indication of high levels of illegality or corruption related to land or natural resources based on government data and reports, international organizations' assessments, local organizations' research, newspapers and journals, and producer and/or community organizations' statements or reports.

Criteria for non-applicability:

- There is no indication of high levels of illegality or corruption related to land or natural resources in the landscape.

Suggested information sources:

- Same as for 2.2.1

Pillar 4: production

4.1.1 Agricultural, agroforestry, and tree plantation productivity

Criteria for applicability:

- Crop and livestock agriculture, agroforestry, and/or tree plantations constitute a significant portion of the land area in the landscape (e.g., 10% or more) and/or are significant drivers of land-use change or major sources of employment or economic activity.

Criteria for non-applicability:

- Crop and livestock agriculture, agroforestry, and tree plantations do not occur or constitute only a minor portion of the land area in the landscape (e.g., less than ~10%) and are not significant drivers of land-use change or major sources of employment or economic activity.

Suggested information sources:

- Land cover maps
- Crop production data
- Employment data
- Producer or stakeholder input on plans or trends in production expansion

<p>4.1.2 Input use efficiency in agricultural, agroforestry, and tree production systems</p>	<p>Criteria for applicability:</p> <ul style="list-style-type: none"> • Agricultural, agroforestry, and/or tree production systems utilize irrigation water on a widespread basis and/or employ intensive cultivation methods with significant fertilizer inputs. <p>Criteria for non-applicability:</p> <ul style="list-style-type: none"> • These production types constitute only a minor portion of the land area in the landscape (e.g., less than ~10%) and include few or no input-intensive production operations, such as large horticulture, floriculture, or confined animal raising operations; or • The majority of production systems in the landscape are rainfed (i.e., not irrigated) and utilize low levels of synthetic fertilizers and pesticides <p>Suggested information sources:</p> <ul style="list-style-type: none"> • Data on the sale of inputs in the landscape • Data from the government or water managers on irrigation water use • Information from producers, agricultural experts, and stakeholders on use of inputs
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3.3 Selecting Optional Indicators

Optional indicators may be included in the LandScale assessment at the user’s discretion. LandScale users may want to assess optional indicators because they provide additional context on landscape sustainability or address priorities of landscape stakeholders (e.g., governments, producers, or civil society) or external actors (e.g., private companies or investors). Table 4 provides a set of considerations that LandScale users may wish to use when determining which optional indicators to include.

Table 4. Considerations for Determining Which Optional Indicators to Include

Pillar 1: ecosystems	
1.1.4 Natural ecosystem connectivity	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Natural ecosystems in the landscape are threatened with future fragmentation that could reduce the viability of ecosystems and the species they support. Characterizing connectivity prior to further fragmentation will provide a useful baseline. ● Threatened ecosystems and/or species populations in the landscape are in danger of being reduced to non-viable sizes as a result of fragmentation that reduces patch size and movement corridors. ● The landscape is significantly fragmented but there are efforts underway or opportunities for restoring connectivity. Providing this baseline will provide a means to measure effectiveness of restoration efforts. <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● Aerial photography or satellite imagery that provides a visual indication of the degree of fragmentation. ● Spatial analysis of fragmentation of natural ecosystem patterns. ● Assessments of the local status or needs of species dependent upon connected natural ecosystems from government, academic, or NGO studies. ● Reports and information on the above from governmental science or conservation agencies, universities, and NGOs.

1.2.3 Biodiversity
habitat degradation

Suggested considerations for inclusion:

- Significant amounts of habitat degradation are present - or degradation is worsening - within Protected Areas (PAs), Key Biodiversity Areas (KBAs), and other areas identified as important for biodiversity conservation.
- Populations of indicator species, threatened species, or other species of conservation concern are decreasing, which may be associated with habitat degradation.
- There are significant gaps in management effectiveness of PAs.
- Current activities, projects, or trends affecting the landscape (e.g., encroaching land uses and human populations, incursion of infrastructure into or adjacent to these areas) are expected to pose significant new or increased threats to ecosystem health.

Suggested sources of information:

- Inspection of aerial or satellite imagery of natural ecosystems (especially in time series), which may reveal indications of degradation.
- Reports on habitat quality by protected area managers, governmental bodies, academic institutions, or conservation NGOs.

<p>1.2.4 Biodiversity habitat restoration</p>	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Within areas identified as important for biodiversity (see definition in LandScale assessment framework), significant presence of restoration activities or restored land including: <ul style="list-style-type: none"> ○ Areas where restoration has been completed; and or ○ Areas where restoration activities are underway or are expected to be initiated by the time of the assessment report publication <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● Findings of the applicability determination for the landscape-dependent Indicator 1.1.4 on Ecosystem Restoration. ● Reports and information from restoration agencies or projects/programs, other governmental bodies, academic institutions, NGOs, and others.
<p>1.2.5 Biodiversity habitat protection</p>	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Significant areas identified for biodiversity are not included in designated protected areas. <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● Geospatial information on areas of importance for biodiversity as well as protected areas from 1.1.1. Analysis of these data layers in combination can determine the degree to which important biodiversity areas are protected. Relevant data may be provided by government agencies, academic institutions, NGOs, and global, national or local data providers or clearinghouses.

<p>1.3.3 Agriculture, forestry and other land use (AFOLU) sector Greenhouse Gas (GHG) sources and sinks</p>	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Significant land-use changes within the last three years that are capable of increasing or decreasing GHG emissions; and or ● Significant changes in ecosystem carbon sequestration within the last three years; and or ● Significant changes in emissions from agricultural production and processing within the last three years. <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● Official, academic or technical analysis documenting historical land-use change. ● GHG emissions by sectors and corresponding <u>Nationally Determined Contribution</u>
<p>1.3.4 Soil health</p>	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Decreasing soil fertility threatens the sustainability of food systems at the landscape level. <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● Information on crop yields and change in yields over time indicates a potential loss of soil fertility ● Existing assessment of soil erosion rate shows substantial loss of nutrients in agricultural lands ● NGO or scientific papers on soil fertility and soil organic carbon monitoring

<p>1.3.5 Other ecosystem services</p>	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> • Presence of additional ecosystem services that are important for the local economy or human well-being, such as insect pollination for local vegetable or fruit crops, wild harvesting of food or fuelwood for local subsistence, or landscape beauty to support ecotourism <p>Suggested sources of information:</p> <ul style="list-style-type: none"> • Information on the prevalence of crops in the landscape that rely upon insect pollination; a list such crops is available here. • Literature or statistics on the importance of ecotourism (e.g. % of GDP or jobs), spiritual value or other ecosystem services associated with the landscape’s ecosystems.
<p>Pillar 2: human well-being</p>	
<p>2.1.6 Vulnerability</p>	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> • The incidence of crime, natural disasters, or severe shocks is high or is increasing in the landscape due to drivers such as climate change, civil unrest and instability, or diminished effectiveness of law enforcement. <p>Suggested sources of information:</p> <ul style="list-style-type: none"> • National and local news and/or reports • Crime statistics • Information on actual or predicted incidence of natural disasters (e.g., based on climate modeling)

Pillar 3: governance	
3.1.3 Resource tenure	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Ongoing issues or conflicts related to natural resource rights (e.g., carbon rights; water rights; rights to use, harvest, or retain trees; etc.) <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● National and local news and/or reports ● Expert knowledge of applicable laws on resource tenure and incidence or risk of conflict related to natural resource ownership and management
Pillar 4: production	
4.1.3 Adoption of sustainable land management practices	<p>Suggested considerations for inclusion:</p> <ul style="list-style-type: none"> ● Sustainable land management (SLM) practices are being (or are expected to be) conducted and at significant scale. ● Landscape stakeholders recognize the need for greater uptake of SLM to address key sustainability issues such as erosion, soil health, pest control, agrochemical pollution, and others. <p>Suggested sources of information:</p> <ul style="list-style-type: none"> ● Data, studies, expert or stakeholder input on the use of SLM practices.

4.1.4 Adoption of sustainable waste management practices

Suggested considerations for inclusion:

- Sustainable waste management practices are being (or expected to be) conducted at a significant scale.
- Management of agricultural solid waste or wastewater is a significant problem in the landscape.

Suggested sources of information:

- Data, studies, expert or stakeholder input on the adoption of sustainable waste management practices.

Box 5. Pilot Experience: Selecting indicators for a Costa Rican Landscape

The pilot landscape located in the watershed surrounding the capital San José, provides water for hundreds of thousands of people and some of the country's biggest industries. The Agua Tica water fund, comprising members from multiple sectors, implements conservation and regeneration activities to safeguard water quality and quantity in the landscape.

The two objectives of conducting a LandScale assessment were to (a) track and communicate progress at landscape level toward improving socioeconomic and environmental outcomes, and (b) to define common goals with other landscape stakeholders, like coffee and meat producers, who were not members of the water fund to facilitate better alignment. Thus, it was essential to include all these actors in the indicator selection process.

IUCN, the assessor leading this pilot, implemented a multi-phased approach to the landscape-dependent and optional indicator selection process that combined desk-based research with multi-stakeholder outreach. First, they undertook a literature review of the data available and conducted interviews with key players (including the Ministry of Environment, water department, Forestry and Climate Change Fund, Ministry of Agriculture, Coffee Institute of Costa Rica (Icafe), and coffee and milk cooperatives), to build upon the understanding of problems and trends identified through the LSA.

Next, IUCN presented recommendations based on this research to Agua Tica for feedback, including a justification for landscape-dependent indicators determined inconclusive or not applicable and an initial proposal for optional indicators to include. IUCN then shared the list of indicators with other landscape stakeholders to confirm the justifications of applicability and identify indicators of interest to specific stakeholders through 1:1 meetings and an online survey.

The selection of landscape-dependent indicators changed after the outreach was conducted, as some stakeholders expressed a strong interest or concern with certain indicators. For example, although it was not deemed relevant initially based on the applicability criteria, the Indicator 4.1.2 on input use efficiency in agricultural,

agroforestry, and tree production systems was included in the final selection because it was of interest to coffee producers and government officials.

Furthermore, the consultation process revealed conflicting information about the poverty indicator, which was a landscape-dependent indicator in version 0.1. The statistical institute's regional poverty assessment did not indicate that poverty was a critical issue for the landscape. However, through consultation, the assessor recognized the significant disparity in income status and the risk of income volatility between coffee and livestock producers and other sectors. The national statistics did not capture this because they do not estimate sector-specific poverty rates. Based on this new information, the assessor decided that understanding and monitoring a disaggregated view of poverty was important and included it in the assessment.

In preparation for metric selection, IUCN also used the indicator selection outreach process to solicit potential data sources for the selected indicators from landscape stakeholders. Overall, this experience demonstrated the importance of involving and engaging various landscape stakeholders during the indicator selection process.

Box 6. Recommended Stakeholder Input for Step 3

Stakeholder input can be informative to determine which landscape-dependent and optional indicators to include. It is recommended to reach out to landscape stakeholders in order to:

- (a) Get input on the relevance of the indicators when unclear, or if they have additional information that could change the determination of applicability; and
- (b) Ask which indicators are important or of interest to those stakeholders aligned with the assessment objectives.

If it is not possible to determine whether a landscape-dependent indicator is applicable, the assessor should reach out to relevant experts. As good practice, an expert should always be consulted before an indicator is left as “inconclusive”.

3.4 Outputs of Step 3

The required and recommended outputs for step 3 are listed below. For the organizations piloting LandScale version 0.2, these outputs may be documented in the reporting template provided.

Required:

- List of landscape-dependent and optional indicators to be included
- List of landscape-dependent indicators to be excluded with a statement of justification based on the considerations presented in table 3

- Documentation of the process used to determine the applicability of landscape-dependent indicators, including any process for stakeholder consultation and desk-based research

Recommended:

- Brief statement explaining the rationale for the inclusion of the selected landscape-dependent and optional indicators

STEP 4

Metric Selection



4 Metric Selection & Assessment

In step 4, the assessor conducts the following tasks:

- Select candidate performance metrics for each applicable indicator as determined in step 3
- Identify, procure, and screen candidate data required to evaluate each metric
- Conduct an evaluation of data quality, finalize metrics selection, and procure supplemental data as necessary
- Process and analyze data to generate results for each metric
- Document findings and decisions from this process

This section also addresses topics of data sharing, data privacy and security, and data documentation.

Box 7. Recommended Stakeholder Input for Step 4

Once the full set of indicators to be considered in the LandScale assessment has been selected, the assessor should present landscape stakeholders with the candidate performance metrics for each indicator and invite feedback on these metrics' relevance and potential feasibility.

Stakeholders are often also very knowledgeable about data for the landscape. Before engaging in an in-depth data search (section 4.2), it may be useful to present possible data sources to stakeholders to begin identifying additional or preferred data. The initial list of data can come from the global data sources identified in the LandScale pillar resources and the assessor's knowledge about local and national data. Stakeholder input can be gathered through various means such as a workshop, an online document, or targeted feedback.

4.1 Selecting Metrics

The process of selecting metrics entails reviewing the metrics' requirements for each of the indicators selected in step 3 and developing a candidate list of metrics. These candidate metrics are then evaluated for data availability. The list of metrics may be subsequently revised if needed based on data considerations.

The LandScale assessment framework includes three key types of performance metrics (and the option to pose alternate metrics) to facilitate use of the most credible and appropriate metrics while also ensuring flexibility:

Required

Some indicators have one or more required metrics. This is the case when specific metrics are generally the best-fit measure(s) for the indicator and/or a reliable global data set exists to measure them. Where more than one required metric exists per indicator, it is because they are all important for assessing the indicator. Often these multiple required metrics rely on the same data, thus requiring little additional effort.

Alternate metrics

In instances where it is not feasible or appropriate to use the required metric (e.g. due to a lack of data), or where the assessor believes that a different metric will yield more reliable information, users may develop an alternate metric to substitute the required metric for the given indicator. When an alternate metric is proposed, a statement of justification is required describing why the required metric is not feasible and/or why the alternate metric provides a superior measure of the given indicator.

Recommended metrics

These metrics are the default for all optional indicators and sometimes accompany required metrics for other indicators. They are not an alternate for a required metric but instead provide additional information to assess the indicator.

Assessor-defined metrics

Some indicators' metrics are identified as assessor-defined or "determined by LandScale assessors." This more open-ended approach to metric selection is used where the indicator covers a broad topic under which specific metrics need to be defined in a context-sensitive manner, for instance for indicator 1.3.5 other ecosystem services, which addresses all other key ecosystem services in a landscape.

Assessors are free to add additional metrics of their own choosing to any indicator, but these do not substitute for the above metrics.

When LandScale assessors develop their own alternate or assessor-defined metrics, the following criteria should be followed to ensure that the metrics are useful and credible:⁸

- **Relevant:** The metric should provide relevant information on the indicator at landscape scale. An alternate metric must provide similar types of information as the required metric for which it substitutes.

⁸ Adapted from *Understanding Ecoagriculture: A Framework for Measuring Landscape Performance* (Buck et al., 2006).

- **Precise:** The metric should provide reliable information on the indicator.
- **Sensitive:** The metric should be sensitive enough to detect sustainability performance and trends at the scale of the landscape. It should be capable of detecting changes in the state of the indicator from one assessment to the next (i.e., from the baseline assessment to the next three-year update assessment).
- **Easy to understand:** The metric should provide intuitive information to LandScale users.

When an alternate metric is proposed as a substitute for a required metric, as part of the justification for the alternate metric the assessor must provide a brief description of how it addresses each of these criteria.

Box 8. Pilot Experience: Working with Stakeholders to Select the Performance Metrics for a Pilot Landscape Assessment in Lamas, Peru

In Lamas, there are several ongoing public and private initiatives to improve sustainability at landscape scale, each with its own monitoring and evaluation metrics. Local government officials decided to use LandScale to facilitate a multi-stakeholder process to select common metrics. This will help them make better use of limited resources to address common environmental and social problems through these initiatives.

From the beginning of the assessment, the team leading the LandScale assessment worked closely with landscape stakeholders, such as government officials and company representatives, to identify and access relevant data sets. During the LSA and indicator selection process, the team compiled a list of data sources that could be used to evaluate different performance metrics. Through this review, the assessment team determined which required metrics for the selected indicators could be evaluated with suitable data. Where data was not available, they defined alternate metrics for the selected indicators that could be evaluated with available data. This involved targeted desk research and interviews with experts (e.g. local biologists) and local authorities. Where data gaps remained despite this process, a small set of indicators was deferred to a later assessment in accordance with LandScale allowances (see section 4.3 completeness of assessment).

The Peru pilot experience demonstrated how important it was to establish relationships with representatives of the public and private sector (e.g., mayors, government officials, company managers, etc.) and other relevant groups early, as this facilitated data collection and effective stakeholder engagement.

To inform the next tasks of identifying and evaluating data for the metrics, the following tables provide the complete metric description and additional details on how the metric should be measured. The pillar resources supplement this information by identifying recommended data sets, methods, and tools to conduct the measurement. Appendix 2

Rationale for Indicators and Performance Metrics contains further explanation and justification of why the given metrics were chosen for inclusion in the LandScale assessment framework.

While some LandScale metrics entail data collection and analysis only for a single point in time (usually the most recent time possible), others also require using data from a baseline year and analyzing change between two points in time. For metrics that require a baseline measurement, this requirement and guidance on selecting the baseline year are specified in the metric explanation. Where baseline measures are not required for a given metric, assessors may, at their option, still include baseline measurements for prior time periods to enable trend analysis, provided that conditions for prior periods can be reliably determined or estimated based on available information.

In addition to metric-specific baselines, in cases where one or more follow-up LandScale assessments have been conducted for a given landscape, the first assessment serves as a comprehensive baseline against which results of future assessments may be compared. This affords greater opportunities for trend analysis, documentation of improvement, and associated claims in landscapes where LandScale is applied on a repeated basis.

4.1.1 Pillar 1: ecosystems

The ecosystem pillar contains the largest number of indicators and metrics. While there are multiple metrics for some indicators, most of these draw on the same datasets so they offer more information without significant additional input data. The ecosystems pillar tab in the pillar resources document contains data sources and recommendations on measuring each metric. Because “ecosystem type” data is required for numerous metrics, a recommended global data set is identified there, and an ecosystem type classification is provided in Annex 2. However, other ecosystem type classifications and data sources may be used if the assessor judges them to be superior in the given context.

Table 5. Metrics for Goal 1.1 Protect and Restore Natural Ecosystems

Indicator 1.1.1 natural ecosystem protection (core)	
Full metric description	Measurement explanation
<p>1.1.1.1 Total area (ha) and percentage (%) of the landscape that is designated and managed for long-term protection, disaggregated by ecosystem type and protected area (PA) category (national designation and corresponding IUCN PA category) (required)</p>	<p>This measurement is a snapshot of status at the time of the assessment. It requires a spatial intersection among three datasets: the landscape boundary, a map showing PAs by IUCN PA category, and an ecosystem type map. The results will be most efficiently reported in a table format.</p>
<p>1.1.1.2 Total area (ha) and percentage (%) of each natural ecosystem type under protection (i.e., within protected areas), disaggregated by ecosystem type and the protected area category (national designation and corresponding IUCN PA category) (required)</p>	<p>This measurement is a snapshot of status at the time of the assessment. It uses the same datasets as the prior metric but calculates a different set of statistics from them. The results will be most efficiently reported in a table format.</p>

<p>1.1.1.3 Percentage (%) of area of protected areas with effective management, disaggregated by IUCN PA category (recommended)</p>	<p>This measurement is a snapshot of status at the time of the assessment. It requires existing attributes of management effectiveness or a process to derive that attribute for each PA and then to calculate the percentage of PA area determined to have effective management. Management effectiveness is best evaluated using a structured assessment system such as the IUCN Green List standard, but other similar objective methods may suffice (e.g. national assessment of PA management effectiveness). When PA management effectiveness has not been assessed, the assessor can use indicators from criteria 3.2, 3.3, 3.6, and 3.7 of IUCN green list standard⁹ to conduct a suitable assessment. Assessors should report the management effectiveness determination for each PA, in addition to the summary statistic described in the metric, to facilitate clear interpretation.</p>
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⁹ IUCN green list standard <https://www.iucn.org/theme/protected-areas/our-work/iucn-green-list-protected-and-conserved-areas/global-standard>

Indicator 1.1.2 natural ecosystem conversion (core)

1.1.2.1 Total area (ha) and percentage (%) of area of natural ecosystems in the landscape that has been recently converted, disaggregated by ecosystem type (required)

This is a single measurement of the area and percentage of natural ecosystem conversion that has occurred since a baseline year. The baseline should include any periods of rapid conversion, ending at the present date (or within a year of it) and began at least 5 years ago but not longer than 30 years ago. Percent conversion should be calculated by comparing the current extent of natural ecosystems to their extent at the baseline year. If historical data or models of pre-settlement ecosystem distribution exist, assessors may supplement the metric with measures of total conversion since that time (i.e., using an older baseline).

1.1.2.2 Natural ecosystem conversion rate (average area [ha] and percentage [%] conversion per yr), disaggregated by ecosystem type (required)

This measurement is a rate that requires a baseline timeframe. It should be measured for the past 3 years for initial LandScale assessments and since the last assessment (but averaged over a period of no fewer than 3 years) for repeat LandScale assessments. Percentage conversion rate should be calculated as the mean annual rate over the measurement period relative to ecosystem extent at the baseline year for this metric.

Indicator 1.1.3 natural ecosystem degradation (core)

<p>1.1.3.1 Total area (ha) and percentage (%) of natural ecosystems in the landscape that are currently degraded, disaggregated by ecosystem type (required)</p>	<p>This measurement is a snapshot of status at the time of the assessment. It utilizes an ecosystem type map and data on degradation. Measuring degradation is challenging so assessors are afforded flexibility in identifying the best methods and data sets for the given landscape. Several data sets, methods, and tools are identified in the Pillar Resources document as resources.</p>
<p>1.1.3.2 Natural ecosystem degradation rate, disaggregated by ecosystem type (required)</p>	<p>This measurement is a rate that requires a baseline timeframe. Data and processes described for metric 1.1.3.1 also apply to this metric. It should be measured for the past 3 years for initial LandScale assessments and since the last assessment (but for a period of no fewer than three years) for repeat LandScale assessments. Rate should be reported as the mean annual area of newly degraded natural ecosystems (averaged over the measurement period) and the percentage (%) of all natural ecosystem area that this yearly increase represents (also averaged over the measurement period relative to total natural ecosystem extent at the baseline year for this metric).</p>

Indicator 1.1.4 ecosystem restoration (landscape-dependent)

1.1.4.1 Total area (ha) under restoration, disaggregated by ecosystem type and restoration type (required)

This is a single measurement of restoration area that includes prior and current restoration actions. It requires spatial data on restoration (as defined in the LandScale assessment framework) actions and ecosystem types. Past restoration actions can include all of those for which spatial location information is available. For restoration action types see Appendix 4: LandScale Restoration Type Classification, but other accepted classifications (e.g. adopted nationally) may be used.

1.1.4.2 Rate of increase (ha/yr) in total area under restoration, disaggregated by restoration and ecosystem type (recommended)

This measurement is a rate that requires a baseline timeframe. It should be calculated as the total area (ha) of land recently put under restoration (as defined in the LandScale assessment framework) per year. This metric should be measured for the past 3 years for initial assessments and since the last assessment (but for a period of no fewer than three years) for repeat assessments.

Indicator 1.1.5 natural ecosystem connectivity (optional)

1.1.5.1 Assessor-defined metrics of connectivity and/or fragmentation appropriate to the types and patterns of natural ecosystems (recommended)

Assessors should define metrics that are suited to the ecosystems and species in the landscape and feasible with available data and technical capacity. Options can range from the use of simple landscape-wide connectivity/fragmentation indices to more advanced mapping or modeling of species-specific movement corridors. More than one metric may be necessary to capture different aspects of connectivity. The metric may be calculated to measure current status of connectivity and/or amount or rate of change since a baseline year.

Table 6. Metrics for Goal 1.2 Protect and Restore Biodiversity

Indicator 1.2.1 threats to species (core)

1.2.1.1 Changes in threats to threatened species using a metric that measures changes in threats of high scope and severity¹⁰ in the IUCN Red List for threatened species in the landscape (required if IUCN Red List Threatened species are present in the landscape)

This is a trend measurement to assess changes in threats over time from one LandScale assessment to the next. For an initial assessment, present status of threats should be measured. For follow-on assessments, threats should be assessed in the same way to document trends in threats over two or more time periods. The Species Threat Abatement and Recovery (STAR) metric¹¹ is recommended but other measures using localized data on species and threats are also acceptable.

¹⁰ High scope are those that affect the whole or majority of the population and high severity are those that cause very rapid to rapid declines as per <https://www.iucnredlist.org/resources/threat-classification-scheme>

¹¹ The Species Threat Abatement and Recovery (STAR) Metric uses the IUCN Red List of Threatened Species data on globally assessed taxa (currently terrestrial vertebrates; trees to be added soon) to calculate a value (the STAR Score) that represents the opportunity to reduce the risk of species extinction in a particular area or landscape. Further information can be found here:

<p>1.2.1.2 Changes in threats to populations of indicator species or other species identified as important in the landscape (this metric is required if 1.2.1.1 does not apply [there are no IUCN Red List species in the landscape], otherwise it is recommended in addition to 1.2.1.1)</p>	<p>This is a trend measurement to assess changes in threats over time from one LandScale assessment to the next. For an initial assessment, present status of threats should be measured. For follow-on assessments, threats should be assessed in the same way to document trends in threats over two or more time periods. Unlike metric 1.2.1.1, this metric cannot use STAR because these species are not addressed by STAR. The assessor may therefore propose a suitable metric of their choosing. Options and sources are provided in the Pillar Resources.</p>
<p>Indicator 1.2.2 biodiversity habitat conversion (core)</p>	
<p>1.2.2.1 Area (ha) of natural ecosystem conversion within areas identified as important for biodiversity and percentage (%) of such areas that this represents¹² (required)</p>	<p>This is a single measurement of the area and percentage of natural ecosystem conversion that has occurred since a baseline year. This measurement can be conducted similarly to 1.1.2.1 but substituting map data on important biodiversity areas for the ecosystem type data.</p>
<p>Indicator 1.2.3 biodiversity habitat degradation (optional)</p>	
<p>1.2.3.1 Area (ha) and percentage (%) of area of natural ecosystem that are degraded within areas identified as important for biodiversity (recommended)</p>	<p>This measurement is a snapshot of status at the time of the assessment. It may use the same data and methods as 1.1.3.1 or may draw on monitoring data within these areas which may provide more accurate results.</p>

<https://www.iucn.org/regions/washington-dc-office/our-work/species-threat-abatement-and-recovery-star-metric>.

¹² Since the baseline year established in 1.1.2.1

Indicator 1.2.4 biodiversity habitat restoration (optional)

1.2.4.1 Area (ha) and percentage (%) of land under restoration within areas identified as important for biodiversity (recommended)

This is a single measurement of restoration area that includes prior and current restoration actions. It can be made using the same data and methods as 1.1.4.1. Optionally this metric can be disaggregated by restoration type (per Appendix 4 or other suitable classification).

Indicator 1.2.5 biodiversity habitat protection (optional)

1.2.5.1 Area (ha) and percentage (%) of areas identified as important for biodiversity that are designated and managed for long-term protection (recommended)

This measurement is a snapshot of status at the time of the assessment. It can use data and methods per metric 1.1.1.1 but must also identify areas that are important for biodiversity that are not under designated protection status. These areas are combined with protected areas to comprise the denominator for the percentage (%) calculation.

Table 7. Metrics for Goal 1.3 Maintain and Enhance Ecosystem Services

Indicator 1.3.1 water quantity (landscape-dependent)	
<p>1.3.1.1 Seasonal water quantity or flow rate of key water bodies (e.g., total volume, depth, volume flow /time) (required)</p>	<p>This is a measure of status of the noted statistics based on an average over a recent period. It will require determining which water bodies to include based on their importance to ecology, human well-being, and production as well as data availability considerations. It will also require selecting an assessment period that captures annual variation and smooths out inter-annual variation due to cycles (e.g. “el niño”) or random variation. Depending on the relative importance of different water resources for human use and ecosystem health, the assessor might choose to include measurements from natural or impounded lake and reservoir levels, groundwater abstraction data,¹³ and streamflow data. It is strongly recommended to obtain records of water gauges and rainfall for at least five years to better understand the relationship between hydrology, land cover, and interannual precipitation and hydroclimatic variability though longer timeframes may be necessary.</p>
<p>1.3.1.2 Water withdrawals (for production or processing) from surface or groundwater versus recharge (ratio) (required)</p>	<p>The measurement is a ratio that expresses the degree to which humans exploit water resources. It should use the same water sources as used in 1.3.1.1, combined with water withdrawal data. Where possible and based on existing hydrological studies, the water recharge of the landscape should take into consideration water inflow/outflow from surrounding watersheds.</p>

¹³ Removal of water from groundwater sources, typically for human use.

<p>1.3.1.3 Frequency of interruption or shortage in water supply for agriculture, domestic and industrial sectors (average number of days per year with interruption or shortage of water availability) (recommended)</p>	<p>This measurement is an average of measures over the same time period as 1.3.1.1 to help smooth random or cyclic interannual variability. Specification of water sources is not required but may be informative about which water sources are experiencing the highest frequency of interruption.</p>
<p>Indicator 1.3.2 water quality (landscape-dependent)</p>	
<p>1.3.2.1 Total suspended solids (TSS) in key water bodies (average mg/l) (required)</p>	<p>This measurement is an average of measures over the same time period as 1.3.1.1. If TSS varies considerably seasonally, assessors may add a seasonal or maximum average level measurement.</p>
<p>1.3.2.2 Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) (mg/l) or nutrients (nitrogen and phosphorus) (load/volume) in key water bodies (required)</p>	<p>This measurement is an average of measures over the same time period as 1.3.1.1. Also, use the same water bodies as 1.3.1.1 unless this is infeasible due to data considerations; additional water bodies may be added at the assessor's discretion. When COD/BOD vary considerably seasonally, assessors should add a seasonal or maximum average level measurement. See WHO recommendations for water quality sampling and monitoring here (p. 22).</p>

<p>1.3.2.3 Diversity of aquatic macroinvertebrates in key water bodies (Biological Monitoring Working Party [BMWP] or another index when appropriate) (recommended)</p>	<p>This measurement is an average based on annual data of the BMWP scores derived from the presence of indicator species in water bodies. It should use the same water bodies as 1.3.1.1 unless this is infeasible due to data considerations; additional water bodies may be added at the assessor's discretion. See WHO recommendations for biological monitoring here. Country-specific BMWP or other index may be used when suitable to local conditions.</p>
<p>1.3.2.4 Concentration of metals or other toxins (load/volume) in key water bodies (recommended)</p>	<p>This measurement is an average of measures over the same time period as 1.3.1.1. Also, use the same water bodies as 1.3.1.1 unless this is infeasible due to data considerations; additional water bodies may be added at the assessor's discretion. See WHO chemical factsheets for more details on how to monitor and maximum permissible values for multiple metals and other toxins.</p>
<p>Indicator 1.3.3 agriculture, forestry and other land use (AFOLU) sector greenhouse gas (GHG) sources and sinks (optional)</p>	
<p>1.3.3.1 Rate of net GHG emissions (tCO₂e¹⁴/yr from X to Y years) from land-use change (recommended)</p>	<p>This measurement is a rate that should be calculated over multiple years to provide an accurate portrait of recent land-based GHG emissions. The baseline year should be the same as in 1.1.2.1. It may be estimated based on rates of conversion (and, if available, rates of degradation and restoration) using a credible model that includes emissions or sequestration rates per ecosystem type for each of these forms of land-use change.</p>

¹⁴ tCO₂e stands for: tonnes (t) of carbon dioxide (CO₂) equivalent (e)

<p>1.3.3.2. Rate of terrestrial (above- and below-ground) C sequestration (tCO₂e/yr) in plants and soil within agricultural, forestry and other production land uses, and land under restoration (recommended)</p>	<p>This measurement is a rate that should be calculated over multiple years to provide an accurate portrait of recent terrestrial C sequestration. Use the same time period as for 1.1.2.1 unless there is a valid rationale to select a different period, in which case this should be justified, e.g. due to land use and land management trends in the landscape as well as data availability. The measurement period should end within the past year. For comparability, use the same input data as for 1.3.3.1 to the extent possible, supplemented with additional information on sequestration associated with changes in land management, restoration, or natural ecosystem dynamics.</p>
<p>1.3.3.3 GHG emissions rate from agricultural production and primary processing (tCO₂e/yr) disaggregated by crop (recommended)</p>	<p>This measurement quantifies the GHG emissions rate over a recent time period. If annual or other time series data are available, calculate an annualized average over the most recent 3-5 years to smooth any random interannual variability. If time series data are not available, calculate an annualized rate based on a single measurement taken within the past three years. It requires data or estimates of GHG emissions from sources such as fertilizer use, livestock methane emissions, and energy use for machinery and electricity. The measurement should be calculated separately for each crop sector or other production types addressed in pillar 4.</p>

Indicator 1.3.4 soil health (optional)	
1.3.4.1 Average soil erosion rate (t/ha/yr) (recommended)	This measurement is a rate that is averaged over a period of several recent years (e.g. 5 years depending on data availability). If time series data are not available, the assessor may propose an alternate snapshot measurement for the most recent year. Using data from multiple years is recommended especially if there is likely to be significant interannual variability, for instance due to variable severity of seasonal heavy rains that cause major soil erosion. The measurement is preferably based on a set of consistently measured and appropriately distributed sample points but may also make use of models that are sensitive to changes in land use, vegetation cover, and management practices that affect erosion rates.
1.3.4.2. Soil health (average % Soil Organic Carbon [SOC]) at a representative sample of production sites across the landscape (recommended)	This measurement is a snapshot of average status at the time of assessment. Sampling sites should be situated within the production types being addressed in pillar 4.
Indicator 1.3.5 other ecosystem services (optional)	
1.3.5.1 Metric(s) determined by LandScale assessors (recommended)	Measurement requires an assessor-defined metric(s). Follow LandScale guidance in this document for crafting appropriate metrics.

4.1.2 Pillar 2: human well-being

The indicators and metrics for goal 2.1 (improve standard of living, especially for vulnerable and or marginalized groups) follow the structure and scope of the

multidimensional poverty concept and are based on several widely used Multidimensional Poverty Indices (MPIs).¹⁵ There are generally three options available for procuring the data necessary to calculate performance metrics under goal 2.1. LandScale encourages the assessor to select the option that is most feasible and likely to yield the best information for the given landscape.

- **Use an existing data source** that has the necessary and desirable properties (e.g. is representative at the appropriate level and includes measurements of the aspects of multidimensional poverty covered by the LandScale metrics). Typically, censuses, household surveys, and administrative records are the three most common existing data sources.
- **Expand or adjust an existing data collection effort** (such as a census or study based on household surveys) by adding questions on dimensions or indicators that are not currently captured and/or by adjusting the sampling framework to provide information that is representative for the landscape and its component population groups.
- **Design and implement a new survey**, with the aim of collecting information on the dimensions of multidimensional poverty covered by the LandScale metrics.

Regardless of the option chosen, assessors should consider (and fulfill to the maximum extent possible) the following good practices for multidimensional poverty assessment:¹⁶

- The information source should include micro-level data, i.e., measurements at the level of the individual or the household.

¹⁵ Many national governments have designed and implemented national MPIs. Because these measures are tailored to the local context, the dimensions and indicators for each national MPI differ. Some indicators, like school attendance, housing, water, and sanitation are nearly universal across national MPIs. Other common indicators that have been adopted include electricity, cooking fuel, child mortality, nutrition, overcrowding, asset ownership, and unemployment/sub-employment. LandScale has included those MPI performance metrics that are the most common across several MPI methods and datasets. Assessors may also define alternate metrics that best apply the MPI concept in the local landscape context as long as all dimensions of MPI specified in the following table are included. More detailed information and other helpful resources can be found in the following documents and are also compiled in the Pillar Resources list available to all LandScale Pilots, some of these are:

- [How to Build a National Multidimensional Poverty Index](#) (UNDP and OPHI 2019)
- [How to apply the Alkire-Foster method: 12 steps to a multidimensional poverty measure](#) (OPHI)
- [Training Material for Producing National Human Development Reports: The Multidimensional Poverty Index \(MPI\)](#) (Alkire and Santos, 2011)
- [Multidimensional Poverty Indexes: Sharing Experiences and Launching a Regional Discussion](#) (OAS, 2013)
- [Piecing Together the Poverty Puzzle \(Chapter 4: Beyond Monetary Poverty\)](#) (World Bank, 2018)

¹⁶ The following guidelines are adapted from: United Nations Development Programme (UNDP) & Oxford Poverty and Human Development Initiative (OPHI), University of Oxford. (2019). *How to Build a National Multidimensional Poverty Index (MPI): Using the MPI to inform the SDGs*. United Nations Development Programme. https://www.mppn.org/wp-content/uploads/2019/07/How_to_Build_Handbook_2019_PDF.pdf

- To the extent possible, it is preferable for data on all metrics under goal 2.1 to come from the same source. This facilitates comparability and interpretability across the multiple dimensions of poverty measurement.
- If it is not possible to evaluate all goal 2.1 metrics based on data from a single source, the assessor may combine information from multiple data sources. In this case, it is recommended (but not required) that the assessor cross-tabulate the data across multiple sources to merge information for the same measurement units (e.g., individuals or households) based on common identification codes.

Table 8. Metrics for Goal 2.1 Improve Standard of Living, Especially for Vulnerable and or Marginalized Groups

Indicator 2.1.1 household income and assets (core)	
<p>2.1.1.1 Percentage (%) of population living below the local poverty line (or, if this is not specified, earning <\$1.90/day) (required)</p>	<p>This measurement is a percentage of people living below the local poverty line (or, if this is not specified, earning less than \$1.90/day) at the time of the assessment. It should be calculated as the percentage of people living under the poverty line out of the total landscape population. If the unit of measurement is the individual, then the metric should be disaggregated by sex when data allows it. (If the unit of measurement is the household, then sex disaggregation is not required.) If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>

<p>2.1.1.2 Percentage (%) of households owning or lacking specific context-appropriate asset(s). Examples include radio, TV, telephone, computer, animal cart, bicycle, motorbike, refrigerator, car, or truck (recommended)</p>	<p>This measurement is the percentage of asset deprivation experienced by the landscape population at the time of the assessment. It should be calculated as the percentage of people experiencing this deprivation out of the total landscape population. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>Indicator 2.1.2 health and nutrition (core)</p>	
<p>2.1.2.1 Percentage (%) of children that are undernourished (required)</p>	<p>This measurement is the percentage of nourishment deprivation experienced by the landscape population at the time of the assessment. It should be calculated as the percentage of people experiencing this deprivation out of the total landscape population. The metric should be disaggregated by sex when data allows it. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>

<p>2.1.2.2 Percentage (%) of population without access to health services (required)</p>	<p>This measurement is the percentage of the landscape population that lack access to health services at the time of the assessment. It should be calculated as the percentage of people experiencing this deprivation out of the total landscape population. If the unit of measurement is the individual, then the metric should be disaggregated by sex when data allows it. (If the unit of measurement is the household, then sex disaggregation is not required.) If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>2.1.2.3 Mortality rate of children under 18 years (averaged over the past five years) (required)</p>	<p>This measurement is the percentage of mortality experienced by children under 18 years within the landscape population, averaged over the five years leading up to the time of the assessment. The metric should be disaggregated by sex when data allows it. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>Indicator 2.1.3 education (core)</p>	
<p>2.1.3.1 Percentage (%) of school-aged children that are not attending school (required)</p>	<p>This measurement is the percentage of children in the landscape that are not attending school at the time of the assessment. The metric should be disaggregated by sex when data allows it. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>

<p>2.1.3.2 Percentage (%) of adults that have not completed primary education (required)</p>	<p>This measurement is the percentage of adults within the landscape population that have not completed primary education at the time of the assessment. The metric should be disaggregated by sex when data allows it. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by age, ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>Indicator 2.1.4 water, sanitation, and hygiene (core)</p>	
<p>2.1.4.1 Percentage (%) of households without access to safe drinking water within a 15-minute walk from home (required)</p>	<p>This measurement is the percentage of households in the landscape without access to safe drinking water within a 15-minute (one-way) walk from home at the time of the assessment. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>2.1.4.2 Percentage (%) of households without a safely managed sanitation facility exclusive to the household (required)</p>	<p>This measurement is the percentage of households in the landscape without a safely managed sanitation facility exclusive to the household (i.e. not shared with other households[s]) at the time of the assessment. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>

Indicator 2.1.5 basic infrastructure (core)

<p>2.1.5.1 Percentage (%) of households without electricity¹⁷ (required)</p>	<p>This measurement is the percentage of households in the landscape without electricity at the time of the assessment. Access to electricity may be provided by a state/national grid or by local, distributed, or household-level systems powered by solar or other energy sources. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>2.1.5.2 Percentage (%) of households where the roof, walls and/or floor are composed predominantly of rudimentary materials (required)</p>	<p>This measurement is the percentage of households in the landscape whose primary dwelling includes roofs, walls and/or floors composed predominantly of rudimentary materials lacking in long-term durability. Examples of rudimentary materials lacking in long-term durability may include (depending on the context) floor made of mud, clay, earth, sand or dung; and roofing or walls of cane, palm/trunks, sod/mud, dirt, grass/reeds, thatch, bamboo, sticks, carton, plastic/polythene sheeting, bamboo/stone with mud, loosely packed stones, uncovered adobe, raw/reused wood, plywood, cardboard, unburnt brick or canvas/tent.¹⁸ If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>

¹⁷ Access to electricity may be provided by a state/national grid or by local, distributed, or household-level systems powered by solar or other energy sources.

¹⁸ United Nations Development Programme: Human Development Reports & Oxford Poverty and Human Development Initiative at the University of Oxford. (2020). *The 2020 Global Multidimensional Poverty Index (MPI)*. UNDP & OPHI. <http://hdr.undp.org/en/2020-MPI>

<p>2.1.5.3 Percentage (%) of households that use dung, wood, charcoal or coal as fuel for cooking or heating (required)</p>	<p>This measurement is the percentage of households in the landscape that use dung, wood, charcoal or coal as fuel for cooking or heating at the time of the assessment. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
<p>Indicator 2.1.6 vulnerability (optional)</p>	
<p>2.1.6.1 Percentage (%) of households that have experienced a severe shock (i.e., a significant loss of income or property) in the past 12 months due to a natural disaster or human-caused events (recommended)</p>	<p>This measurement is the percentage of households in the landscape that have experienced a severe shock (i.e., a significant loss of income or property) in the past 12 months due to a natural disaster or human-caused events. This includes shocks due to natural disasters (e.g., drought, flooding, or earthquakes) as well as those due to human-caused events whose source is outside the affected household or community (e.g., civil unrest, armed conflict, and war). The assessor may define a context-appropriate threshold for what constitutes a “severe” shock, for instance an income loss or a livestock herd loss of 40% or more due to drought-induced crop failure. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>

<p>2.1.6.2 Percentage (%) of households that have been subject to crime in the previous 12 months (recommended)</p>	<p>This measurement is the percentage of households in the landscape that have been subject to crime in the previous 12 months. If it is impracticable to assess this metric for the 12 months directly preceding the assessment, then any other contiguous 12-month period ending within the past year may be used. The metric may also be assessed over a longer period (up to a few years) that ends within the 12 months preceding the assessment. If the measurement is taking place in both urban and rural areas, the metric should be disaggregated to distinguish both. Optionally, this metric can be further disaggregated by ethnicity, indigenous groups, occupation, economic activity, and other social or economic criteria.</p>
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LandScale recognizes the challenges in assessing human rights outcomes at the landscape level due to data limitations and the inherently hidden nature of many human rights violations. For these reasons, LandScale has developed additional guidance for assessing human rights (goal 2.2), which is presented in Annex 3. Human Rights Assessment Guidance and Annex 4. Human Rights Enabling Conditions. This guidance places increased emphasis on stakeholder consultation and desk-based research to overcome typical limitations in existing secondary data on human rights-related violations and enabling conditions. It is based on and builds from several existing recognized methodologies and tools, as further elaborated in the annexes. To select and measure performance metrics for the indicators under goal 2.2, assessors must consult and follow the material in the following table as well as annexes 3 and 4.

Table 9. Metrics for Goal 2.2 Respect, Protect, and Fulfill Human Rights

<p>Indicator 2.2.1 child labor (landscape-dependent)</p>	
<p>2.2.1.1 Assessor-defined metrics based on identified enabling conditions - see annexes 3 & 4 (required)</p>	<p>Measurement requires assessor-defined metrics. The assessor should select at least one structural metric, at least one process metric, and at least one outcome metric. See annex 3 for the definitions and examples of structural, process, and outcome metrics. If performance metric 2.2.1.2 is included, then this will suffice as the outcome metric for 2.2.1.1 See annexes 3 and 4 for additional information on selecting metrics for this indicator.</p>

<p>2.2.1.2 Estimated number of child laborers in economic activities of interest (recommended)</p>	<p>This is a snapshot estimate of the number of child laborers in the economic activities of interest at the time of the assessment. The measurement is expected to be an estimate because it is typically difficult to detect and report every instance of child labor. The assessor should develop the estimate based on one or more locally relevant sources of information pertaining to the recent period (e.g. the three years leading up to the date of the assessment). Data sources typically include results of questionnaire-based surveys on child labor for the working environments of interest. These may be triangulated with additional data sources, such as school attendance data. If the data allows it, estimates should be disaggregated by sex, migrant status, and other population characteristics (e.g. children within at-risk population groups).</p>
<p>Indicator 2.2.2 forced labor (landscape-dependent)</p>	
<p>2.2.2.1 Assessor-defined metrics based on identified enabling conditions - see annexes 3 & 4 (required)</p>	<p>See 2.2.1.1</p>

<p>2.2.2.2 Estimated number of forced laborers in economic activities of interest (recommended)</p>	<p>This is a snapshot estimate of the prevalence of forced labor in the economic activities of interest at the time of the assessment. It should be reported as the estimated number of forced laborers and the rate of forced labor (e.g. number of forced laborers per thousand people in the landscape context), disaggregated for each economic activity (e.g., sector or crop) of interest. The measurement is expected to be an estimate because it is difficult to detect and report every instance of forced labor, which is usually hidden by its perpetrators. The assessor should develop the estimate based on one or more locally relevant sources of information pertaining to the recent period (e.g. the three years leading up to the date of the assessment).¹⁹ Data sources typically include surveys and official records. Survey-based methods may seek to query workers, their family members, or other informants at their place of residence, workplace, or other places they frequent (e.g., the contractor for whom they work, a street where they regularly pass, or a border where they cross). If the data allows it, estimates should be disaggregated by sex, children vs. adults, migrant workers, and other population characteristics (e.g. people in specific at-risk groups).</p>
<p>Indicator 2.2.3 workers' rights (landscape-dependent)</p>	
<p>2.2.3.1 Assessor-defined metrics based on identified enabling conditions - see annexes 3 & 4 (required)</p>	<p>See 2.2.1.1</p>

¹⁹ International Labour Office ILO. (2018). *Measurement of forced labour*. 20th International Conference of Labour Statisticians. https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_636050.pdf

Indicator 2.2.4 other human rights (landscape-dependent)

2.2.4.1 Assessor-defined metrics based on identified enabling conditions of other human rights - see annexes 3 & 4 (required)

See 2.2.1.1.

4.1.3 Pillar 3: governance

Table 10. Metrics for Goal 3.1 Recognize and Protect Rights to Land and Resources, and Reduce Related Conflicts

Indicator 3.1.1 land tenure (core)

3.1.1.1 Percentage (%) of the landscape with formalized land tenure rights (required)

This measurement is the percentage of the landscape with formalized land tenure rights. “Formalization” signifies that the land tenure rights are officially recognized by the national government and/or local governments to which it has delegated authority. For instance, in cases where communities hold customary land rights, these are considered formalized if the state government formally recognizes them.

<p>3.1.1.2 Assessor-defined metric(s) for gender dimension of land tenure rights (recommended)</p>	<p>This measurement requires an assessor-defined metric or set of metrics to assess gender components related to land tenure rights. The metric(s) can be quantitative (e.g. number of individual land titles owned by women) and/or qualitative (e.g. the degree to which women’s rights to property are recognized by law). The assessor may include as many metrics as necessary to assess gender in the context of land tenure rights.</p>
<p>Indicator 3.1.2 land conflicts (core)</p>	
<p>3.1.2.1 Number of unresolved land and resource conflicts or grievances, and the area of land (ha) subject to such conflicts (required)</p>	<p>This measurement is the number of unresolved land and resource conflicts or grievances and the amount of land in hectares that is subject to such conflicts. Conflicts may include land grabs, instances of community displacement, violence or genocide related to land disputes, nonconformity with free, prior, and informed consent (FPIC) processes, boundary disputes, and resource management exclusion, among others. The assessor should specify the period of time over which the metric is calculated. To facilitate interpretation of this quantitative metric, the assessor should also report a brief summary of the nature and context of each unresolved conflict or grievance and whether it involves any marginalized and/or vulnerable groups.</p>

<p>3.1.2.2 Number of people (e.g., environmental and human rights defenders) subject to violence or receiving threats of violence as a result of conflicts over land and resources (required)</p>	<p>This measurement is the number of people that have been subject to violence or received threats of violence as a result of conflicts over land and resources. The assessor should specify the period of time over which this is calculated. To facilitate interpretation of this quantitative metric, the assessor should also report a brief summary of the nature and context of each instance or threat of violence and whether it involves marginalized and/or vulnerable people. The assessor should indicate the period of time for which the metric has been calculated.</p>
<p>Indicator 3.1.3 resource tenure (optional)</p>	
<p>3.1.3.1 Assessor-defined metrics on access and use rights for key natural resources in the landscape (recommended)</p>	<p>To develop appropriate assessor-defined metric(s), the assessor should first identify the key natural resources on which to focus. These may include carbon (i.e., the right to benefit from reduced greenhouse gas emissions and/or increased carbon sequestration from REDD+ or other project activities), trees, water, or others. The metric(s) may be quantitative (e.g. number of landowners or area of land holdings with access and use rights) and/or qualitative (e.g., the degree to which carbon rights of landowners are recognized by law). The assessor may include as many metrics as necessary to assess resource access and use rights.</p>

Table 11. Metrics for Goal 3.2 Promote Transparency, Participation, Inclusion, and Coordination in Land-Use Policy, Planning, and Management

Several metrics for indicators under this goal rely upon elements of the Sustainable Landscapes Rating Tool (SLRT), which provides a structured method to evaluate governance and enabling conditions for sustainable landscape management.²⁰

Indicator 3.2.1 land-use plan adoption and enforcement (core)	
<p>3.2.1.1 Quality and status of land-use and/or zoning plans (based on SLRT indicators 1.1.1, 1.1.2 and 1.1.3) (required)</p>	<p>This measurement is a snapshot of the quality and status of land-use plans and/or zoning in the landscape at the time of the assessment. This includes determining whether plans are formally adopted, whether they cover the entire landscape, and whether they were developed through participatory processes. LandScale requires the use of the SLRT indicators 1.1.1, 1.1.2, and 1.1.3 to qualitatively assess this performance metric. (At their option, assessors may choose to evaluate additional SLRT indicators or to conduct a full SLRT assessment.) The required SLRT indicators should be assessed through a participatory process. This may be done by the sustainable landscape partnership in the landscape (if one exists) or with key landscape stakeholders that are knowledgeable on the subject. If neither is possible, stakeholder perspectives may be collected and synthesized by the assessor from other sources such as reports, meeting proceedings, history of land-use plan development, and others.</p>

²⁰ The Sustainable Landscapes Rating Tool (SLRT) is available [here](#). This evaluation framework includes criteria for key enabling conditions structured under different themes. The SLRT indicators (in this case, the LandScale metrics) are divided into two groups that complement each other to provide a clearer picture of the landscape in question. Level 1 indicators, those that can be assessed through published evidence, tend to focus on the existence and quality of laws, policies, plans, systems and platforms, while Level 2 indicators, those that need to be assessed through interviews, consider the extent to which laws are implemented and respected. The SLRT provides detailed guidance to rate each indicator as A (high, full, clear), B (medium, partial), C (low, not addressed), or ID (insufficient data).

<p>3.2.1.2 Percentage (%) of landscape covered by land-use or zoning plans that are formally adopted²¹ and enforceable (required)</p>	<p>This measurement is the percentage of the landscape covered by land-use or zoning plans that are formally adopted and enforceable at the time of the assessment. To substantiate the percentage value, the assessor should evaluate and document: 1) which plans have been formally adopted and by whom, 2) which of these are enforceable, including a brief summary of the means by which they are enforceable (e.g., permitting processes, inspection authorities, fines and sanctions, etc.), and 3) the area of land to which each applies.</p>
<p>3.2.1.3 Amount (ha) and percentage (%) of the landscape that is subject to overlapping and competing land-use plans (recommended)</p>	<p>This measurement is the amount in hectares and the percentage of the landscape that is subject to overlapping and competing land-use plans at the time of the assessment. Where overlap is a recognized aspect of a plan, such as special overlay zones that clearly specify which uses or rules take precedence, such overlaps may be disregarded from this calculation. To substantiate the percentage value, the assessor should evaluate and document: a) the instances and nature of overlap or conflict among plans; and b) the area of each such overlap or conflict.</p>

²¹ As defined in metric 3.2.1.1 by the SLRT indicator criteria, land-use plan or zoning is considered formally adopted when it is recognized by law and regulations require that it is respected.

<p>3.2.1.4 Amount (ha) and percentage (%) of the landscape with recent land-use change that is inconsistent with land-use plan(s) (recommended)</p>	<p>This measurement is the amount in hectares and the percentage of the landscape that has experienced land-use change that is inconsistent with land-use plans during a recent time period that ends at the present time (or within a year of it). LandScale recommends that the time period for this assessment be the same as that used for indicator 1.1.2.1; however, the assessor may choose a different time period due to data availability or other considerations provided that a valid rationale is clearly documented. To substantiate the quantitative measures for this metric, it is recommended that the assessor map or tabulate the areas of recent land-use change that are inconsistent with plans and calculate their total area and provide this map or tabulation as part of the assessment documentation.</p>
<p>Indicator 3.2.2 coordination of government agencies in land-use policy, planning, and management (core)</p>	
<p>3.2.2.1 Quality and status of government coordination on land-use policy, planning, and management across sectors (based on SLRT indicators 4.1.1, 4.1.2 and 4.1.3) (required)</p>	<p>This measurement is a snapshot of the quality and status of government coordination on land-use policies, planning, and management across sectors at all levels from national to local jurisdictions. These sectors are generally presumed to include agriculture, forestry, environment, mining, energy, transport, planning, and interior. Assessors should adjust this list and add additional sectors, if needed, based on the landscape context. LandScale requires the use of SLRT indicators 4.1.1, 4.1.2 and 4.1.3 to qualitatively assess this metric. (At their option, assessors may choose to evaluate additional SLRT indicators or to conduct a full SLRT assessment.) See metric 3.2.1.1 for more guidance on the SLRT.</p>

Indicator 3.2.3 stakeholder participation and inclusion in land-use policy, planning, and management (core)

3.2.3.1 Quality and status of stakeholder participation and inclusion in land-use

policy, planning, and management (based on SLRT indicators 4.3.1, 4.3.2, 4.3.3, 4.3.4 and 4.3.5) (required)

This measurement is a snapshot of the quality and status of stakeholder participation and inclusion in land-use policy, planning, and management at the time of the assessment. This is a qualitative metric that evaluates how key stakeholder groups are represented and included in decision-making processes related to land. LandScale requires the use of SLRT indicators 4.3.1, 4.3.2, 4.3.3, 4.3.4 and 4.3.5 to qualitatively assess this metric. (At their option, assessors may choose to evaluate additional SLRT indicators or to conduct a full SLRT assessment.) See metric 3.2.1.1 for more guidance on the SLRT.

Indicator 3.2.4 illegality and corruption related to land and resources (landscape-dependent)

<p>3.2.4.1 Perceived level of corruption related to land and resource allocation and use (required)</p>	<p>This measurement is a snapshot of perceived levels of corruption related to land and resource allocation and use at the time of the assessment or over a recent period. Since corruption is usually unsanctioned or illegal, it tends to be hidden and undocumented, complicating the assessment of the problem. Nevertheless, levels of corruption can be estimated by combining information on the extent of corruption with information on the conditions that tend to enable and sustain corruption. Assessors should use both types of information to assess this metric, drawing upon information from reports or victims of corruption (experience), surveys of experts and stakeholders on levels of corruption (perceptions), and official government data (e.g., corruption complaints, investigations, prosecutions, convictions).²² The assessor may draw upon information sources from the past five years as long as each source remains relevant to the present situation. As an example, if an assessment of corruption levels is strongly based on conditions linked to a prior political administration that is no longer in power, then the source might not provide an accurate portrayal of the present situation.</p>
<p>3.2.4.2 Incidence of illegality related to land and resource use and management (required)</p>	<p>This measurement is a snapshot of the incidence of illegality related to land and resource use and management at the time of the assessment. Illegality can usually be assessed through official records and statistics published by local authorities. To provide quantitative and/or qualitative measures of this metric, the assessor may draw upon multiple information sources from the past five years as long as each source remains relevant to the present situation.</p>

²² Hart, E. (2019). *Guide to using corruption measurements and analysis tools for development programming*. U4 Anti-Corruption Resource Centre, Chr. Michelsen Institute. <https://www.u4.no/publications/guide-to-using-corruption-measurements-and-analysis-tools-for-development-programming>

4.1.4 Pillar 4: production

Table 12. Metrics for Goal 4.1 Promote Regenerative Agricultural, Agroforestry, and Tree Production Systems

Indicator 4.1.1 agricultural, agroforestry, and tree plantation productivity (landscape-dependent)	
4.1.1.1 Average crop productivity (yield/ha) disaggregated by crop (required)	This measurement is a snapshot of average productivity at the time of the assessment, or for a recent period, for the production activities of interest. The measure of productivity may be averaged over a recent multi-year period if necessary, to smooth year-to-year variations in harvest volume.
4.1.1.2 Average productivity of pasture-raised animals (livestock units/ha) disaggregated by animal type (required)	This measurement is a snapshot of average productivity at the time of the assessment, or for a recent period, for the production activities of interest. The measure of productivity may be averaged over a recent multi-year period if necessary, to smooth year-to-year variations in harvest volume.
4.1.1.3 Average forest plantation productivity (timber volume/ha) disaggregated by plantation type (required)	This measurement is a snapshot of average productivity at the time of the assessment, or for a recent period, for the production activities of interest. The measure of productivity may be averaged over a recent multi-year period if necessary, to smooth year-to-year variations in harvest volume.

Indicator 4.1.2 input use efficiency in agricultural, agroforestry, and tree production systems (landscape-dependent)

4.1.2.1 Fertilizer use efficiency (quantity of product produced per unit of nitrogen, phosphorus, and / or potassium [NPK] use) disaggregated by product (required)

This measurement is a snapshot of the average fertilizer use efficiency at the time of the assessment, or for a recent period, for the production activities of interest. It may rely upon sampled data from producers and/or sales data on fertilizer inputs in the landscape. The measure of efficiency may be averaged over a recent multi-year period if necessary, to smooth year-to-year variations fertilizer use, harvest volume, or both.

4.1.2.2 Water use efficiency (quantity of product produced per unit of water use) disaggregated by product (required)

This measurement is a snapshot of the average water use efficiency at the time of the assessment, or for a recent period, for the production activities of interest. It may be calculated based on sampled data from producers, data from water providers or regulators, and/or estimates made from information provided by experts. The measure of efficiency may be averaged over a recent multi-year period if necessary, to smooth year-to-year variations in water use, harvest volume, or both.

Indicator 4.1.3 adoption of sustainable land management practices (optional)

4.1.3.1 Land area (ha) under major crop, livestock and/or plantation forestry production that utilize Integrated Pest Management (IPM) and percentage (%) of total production area that this represents (recommended)

This measurement is a snapshot of IPM adoption at the time of the assessment, or over a recent period, for the production activities of interest. It requires data on the extent of IPM by production type.

<p>4.1.3.2 Land area (ha) under other specific sustainable land management (SLM) practices appropriate to the crop, livestock, and / or plantation forestry systems in the landscape, disaggregated by practice and production system and percentage (%) of total production area that this represents (recommended)</p>	<p>This measurement is a snapshot of the adoption of other SLM practices at the time of the assessment, or over a recent period, for the production activities of interest. It requires data or estimates on SLM practices' extent by production type. Reporting by practice is preferred if data is available. SLM practices may be categorized, for example, by FAO's system.²³</p>
<p>4.1.3.3 Assessor-defined metric on environmental and health risk from pesticide use (recommended)</p>	<p>This measurement is a snapshot of risk at the time of the assessment, or over a recent period, for the production activities of interest. LandScale recommends use of the <u>Environmental Impact Quotient (EIQ)</u> to calculate this metric but other suitable measures may be used instead at the assessor's discretion. If the EIQ is used to determine the environmental impact in a particular landscape: Calculate the EIQ field use rating (FUR): $\text{EIQ} \times \% \text{ active ingredient} \times \text{dose (volume/mass per area)}$. If multiple active ingredients are in use, you would add the EIQ-FUR scores across the landscape. A lower EIQ-FUR value indicates a lower environmental impact. An online calculator is available here. If application rates are not known, a dose measurement based on purchase/sale data of pesticides within the landscape can be used. In that case:</p> <p>$\text{EIQ-FUR (landscape)} = \text{EIQ} \times \% \text{ active ingredient in product} \times \text{volume or mass of pesticide sold/purchased per unit area.}$</p>

²³ FAO SLM resources: <http://www.fao.org/land-water/land/sustainable-land-management/slm-practices/en/>

<p>4.1.3.4 Extent and percentage of fire in natural ecosystems resulting from agricultural land management (ha and % burned area/year) (recommended)</p>	<p>This measurement is a rate that should be calculated over a recent period of roughly 3-5 years leading up to the time of the assessment. It requires data on, or estimates of, the area burned each year that can be directly or indirectly attributed to agricultural production activities. This indicator quantifies only the areas of natural ecosystems burned, not burning of production areas. Optionally, the assessor may disaggregate results by ecosystem type and crop type to better illustrate which ecosystems are predominantly affected and by which production types.</p>
<p>4.1.4 adoption of sustainable waste management practices (optional)</p>	
<p>4.1.4.1 Assessor-defined metrics on adoption of sustainable waste management practices for agricultural solid waste and wastewater (recommended)</p>	<p>This measurement requires development of assessor-defined metrics. Specification of the metric(s) should address the types of waste generated by the production types included in 4.1.1.1.</p>

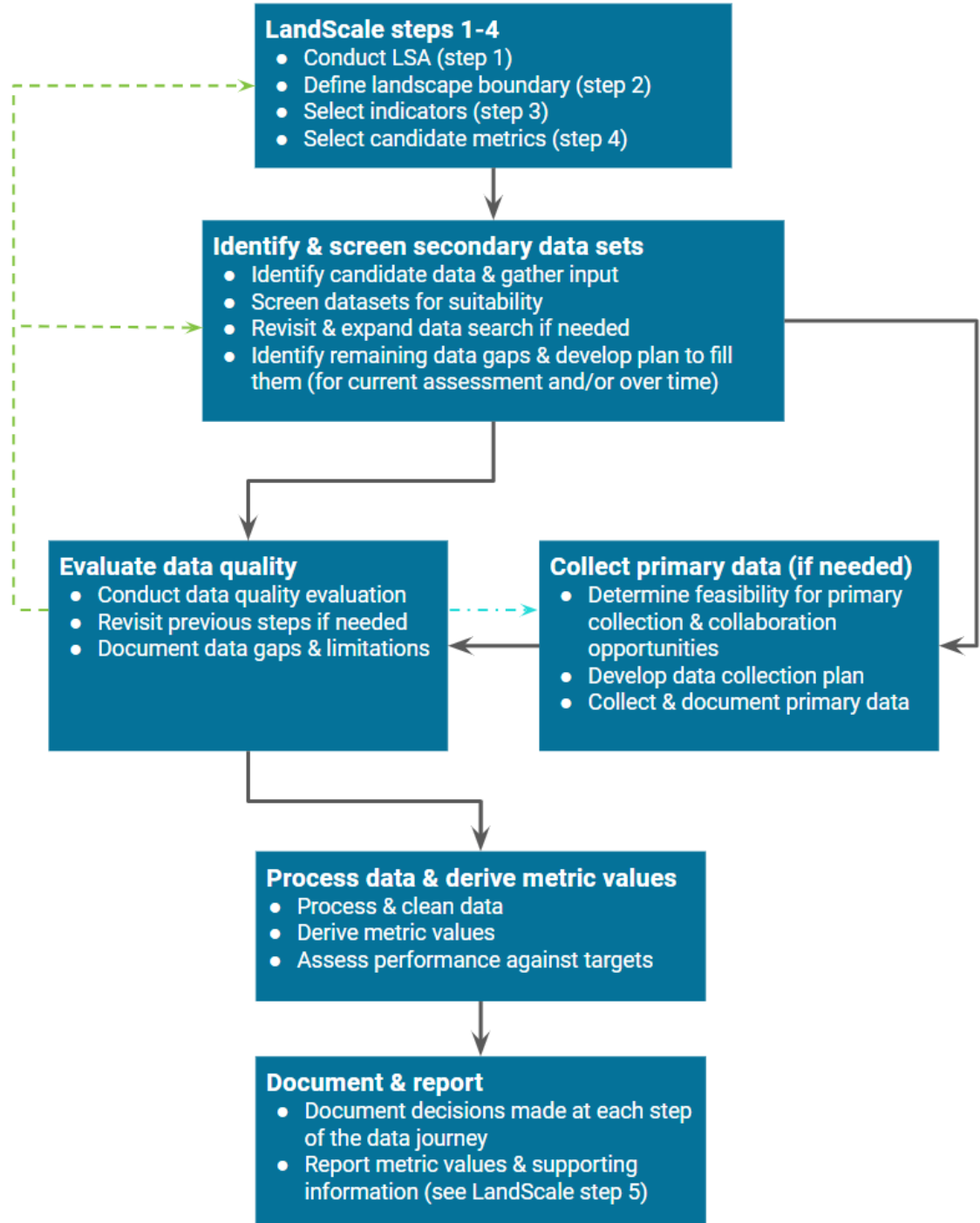
4.2 Gathering and Evaluating Data

4.2.1 Introduction

Gathering and analyzing data to measure the metrics can be the most time-consuming aspect of a LandScale assessment. This section provides requirements and recommendations, coupled with additional resources (available for LandScale Pilots in the Pillar Resources), to guide and support this part of the assessment. The process for identifying, screening, and evaluating data sources is presented here in a sequential manner but in practice might require iteration to secure sufficient good-quality data. The data journey illustrated below provides a summary of this process. The remainder of step 4 is organized according to the data journey.

Figure 2. Data Journey to Evaluate Landscale Metrics

The data journey focuses on step 4 of the assessment process, however, data considerations should be included through the entire process, as noted in the stakeholder engagement boxes in steps 1-4. Dashed lines indicate possible need to revisit prior decisions or broaden the search for datasets.



4.2.2 Identify and screen secondary data sets

LandScale assessments can draw upon a wide variety of data and from many different sources. Key data types and characteristics that are most relevant for assessments are summarized in the following box. Throughout this document the term “data” refers to data generally and to the specific values recorded for observations, or instances, within a single dataset. The term “dataset” refers to a single data file describing a particular theme, such as a “land cover” dataset. “Data set” refers to a collection of datasets, i.e., the collection of data for the entire LandScale assessment.

Box 9. Introduction to Data Characteristics

Given LandScale’s holistic approach to assessment, assessors will typically utilize a variety of data to conduct an assessment. The list below defines some common types of data and their characteristics.

Secondary vs. primary data — Secondary data are any data that are not specifically and newly collected for the purpose (in part or in whole) of conducting a LandScale assessment. Primary data are those that are newly collected within a given landscape for the purpose (in part or in whole) of conducting a LandScale assessment.

Quantitative vs. qualitative data — Quantitative data are numerical in form and can be used with statistics to measure and analyze observable states, changes, trends, and comparisons. In contrast, qualitative data, such as notes from an interview, or a case study, are non-numerical and are more useful in understanding multi-faceted phenomena that cannot be reduced to specific quantities, such as human perception, motivation, interpersonal interactions, or characteristics and functioning of human institutions and groups.

Measured vs. modelled data — Measured data are generated using direct measurement. For example, an electricity meter is used to produce measured data: each recorded value reflects a direct measurement of electricity usage. In contrast, modelled data are created through inference by using input data, theory, modeling assumptions, and statistics in order to infer findings about a variable of interest. For example, weather forecasts rely on a diverse range of historical data and other observations to estimate or predict data values (e.g. future temperatures).

Survey data — Survey data use a standardized survey or poll to elicit responses from participants, commonly about socio-economic and demographic information. Surveys can be implemented through enumerators (i.e., interviewers), paper questionnaires, or online forms. Surveys can be implemented for an entire population of interest or for a sampled subset of it. Census data is an example of survey data without sampling. More commonly, surveys use sampling and statistics in order to infer findings about the whole population by sampling a representative portion of it.

Self-reported data — Self-reported data rely on participants to report data about themselves, without independent measurement or validation. The lack of independent

validation can introduce errors or bias, especially if respondents have a strategic reason to provide false information (e.g., under-reporting their income if they think this will reduce their tax burden or improve their chance of receiving social welfare benefit) or if questions are posed in a subjective way that encourage different understandings of the phenomenon in question (e.g. asking respondents to characterize their own health status without more specific questions or guidance).

Geospatial data – Geospatial data are comprised of attributes about data values and location of those values (e.g. the elevation along a topographic contour line). Spatial data can be in the form of geographic points, surfaces composed of pixels (i.e., rasters), lines, or polygons and a geospatial dataset is often referred to as “data layer.” Any of the above data types may be geospatial. Geospatial data can be depicted in map layers, which may be analyzed alone or overlaid in combination with other geospatial layers (such as land use, population characteristics, roads and infrastructure, or many others) in a geographic information system (GIS) to calculate useful statistics. For example, an assessor can compare levels of tree cover in different municipalities by using GIS to overlay a tree cover data layer with a municipal boundary data layer, calculating the amount of tree cover in each municipality, and comparing these quantities. Geospatial data comes in two forms: raster and vector. Raster data are composed of pixels, each of which has data value(s) for the data’s given theme(s), such as land cover type or percent tree cover. Vector data include points, lines, and polygons. Political boundaries are a common example of vector data.

Note that the above categories are not mutually exclusive: any given dataset may be characterized by several of the above features or types. For example, the variable tree cover loss is commonly secondary, quantitative, modelled, and geospatial data. For comparison, household income could be primary, quantitative, surveyed, and non-geospatial data, if no geospatial information is recorded.

Box 10. Pilot Experience: Collecting Data from Different Sources for Performance Metrics

Collecting data for performance metrics for a first baseline assessment can be challenging and time-intensive, particularly if no similarly broad assessment or planning activity has collected such data recently. For the assessor team, the first baseline assessment may be the team’s first time conducting such a broad data-gathering activity. After completing the baseline assessment, it is anticipated that collecting and generating updated data for follow-on assessments will take less time and effort. This is because assessors can leverage the knowledge of data sources, extant data set, and data management they built during the baseline assessment to streamline subsequent data gathering, evaluation, and documentation activities.

Experience from the LandScale pilots provides several useful learnings that can inform assessments elsewhere:

- 1) Secondary data sources are often decentralized, meaning that assessors may need to gather data from multiple sources to generate a full set of data for the assessment.
- 2) Where data are available, they are not always available at the right scale to provide sufficient detail about landscape-level characteristics (e.g. data set that are resolved to the province level but not at the district or municipal level).
- 3) Some data may be obsolete for representing current status; for instance, if they are part of datasets that are not regularly updated, or the landscape is experiencing rapid change.

Below are some examples of how assessors in the LandScale pilot sites navigated these and other data collection challenges by combining multiple data sources to assess a single metric and by using available data sources to assess multiple metrics.

Water quantity

The Rainforest Alliance team leading the Peru pilot selected flow rate of key water sources (volume/time) as the performance metric to assess the water quantity indicator. However, when they looked for data, they realized it was spread across different institutions, so the team had to invest a significant amount of time reviewing various technical reports about the rivers in the landscape. To generate a value for the water flow metric, the team calculated the average flow rate for 2018 using data from the six different rivers located in the landscape.

In the case of the Costa Rica pilot, the IUCN team also selected flow rate as the performance metric for the water quantity indicator. To measure this metric, they first requested data from all the relevant water service providers (WSPs) in the landscape. The assessor calculated the metric value by using WSP data to calculate the average flow rate from 27 rivers or springs in the landscape, utilizing records from the last five years when possible. This average was then compared with historical averages to understand whether the river flows were increasing or decreasing over the past decade.

Access to basic services

When Nature Conservation Research Centre (NCRC), the partner leading the Ghana LandScale pilot, assessed the version 0.1 indicator on access to basic services, they intended to gather data on the following version 0.1 performance metrics:

- School attendance rate (% of children)
- Percentage of rural population with electricity access
- Percentage of rural population with safe drinking water access

It was not possible to obtain data on the last two metrics for the pilot assessment. NCRC therefore plans to continue collecting data on these metrics when testing methodologies for version 0.2 of the assessment framework. To fill the data gap for

the first pilot assessment, NCRC used an alternate metric (percentage of households with access to basic needs) found in a research paper that studied the landscape. This alternate metric provides a single measure of access to basic needs that considers access to water, sanitation, and electricity.

4.2.2.1 Identify candidate data and gather Input

The first step toward assessing performance metrics is to identify candidate data sources. This initial data search should consider data sources identified by LandScale (below and in the Pillar Resources), other data sources known to the assessor, and data sources identified through consultations with stakeholders and experts. LandScale strongly recommends engaging stakeholders and local experts early in the process to help identify potential data for the candidate metrics (see box 10). Doing so is likely to save the assessor time and can reveal valuable information about data sources, limitations, and quality characteristics that can help the assessor choose the optimal combination of data sources from the outset.

Typical secondary data sources that assessors should canvass to identify candidate data sets include:

- Geospatial data on land and water features, land cover, and land-use change, such as datasets hosted by [NASA](#), [Google Earth Engine](#), [European Space Agency](#), [Esri Living Atlas](#), [Trends.Earth](#), [Global Forest Watch](#), [MapBiomass](#)
- Data provided by government agencies, such as national statistics offices and ministries and departments of agriculture, forestry, environment, planning, etc.
- Intergovernmental and international organizations, e.g., World Bank ([Open Data](#), [MicroData Catalogue](#)), [OECD](#), [UN](#)
- Research institutes and NGOs/CSOs, e.g. the World Resources Institute
- Data collected as part of research studies
- Third-party commercial, private data, or paid subscription portals, e.g. [IBAT](#)
- Qualitative media data, e.g., coverage in local, national, or international newspapers

The LandScale Pillar Resources lists specific sources from the preceding categories, and is continuously updated as new data, tools, and methods are discovered. In addition, the Pillar Resources include tools to generate LandScale-relevant data from other sources, methods for generating new data, and methods for processing data to derive values for performance metrics. While global data sources are identified to help ensure data availability for all landscapes, sub-global data are often superior in terms of

thematic detail (e.g. level of ecosystem classification), spatial detail (e.g. raster cell size), currentness, and frequency of time series data. Therefore, assessors are strongly encouraged to seek out potentially superior data sources before relying on global data.

During the initial data search, LandScale encourages assessors to identify all relevant data set that may be candidates for evaluating performance metrics, including duplicate data set for each metric. where available. Doing so will reduce the need to re-open the data search later if some candidate data sources do not pass screening or quality criteria. Additionally, it helps enable the assessor to select the most accurate and suitable data available for each metric. For metrics that have two or more suitable data sources, the assessor may wish to select the source(s) that provide information in a form as close as possible to that needed to measure the metric. This will reduce the need for data manipulation.

Where there are no suitable secondary data sources for a given performance metric, assessors should explore options for generating primary data. In some cases, primary data can be generated within the scope and time frame of a LandScale assessment so that the data may be used in the assessment. In other cases, primary data collection is a longer-term endeavor, and assessors or other landscape stakeholders may need to initiate data-generation processes or monitoring systems that will not yield data in time for the present assessment but can inform future assessments in the same landscape. See section 4.2.3 collect primary data below for more information.

4.2.2.2 Screen datasets for suitability

Once the assessor has identified candidate secondary datasets for a given metric, the datasets should be screened using the criteria and considerations provided below. For this initial screening, the goal is to eliminate datasets that are irrelevant, duplicative with superior datasets, or are likely to be unsuitable for use in the assessment due to obvious quality limitations. This process is meant to provide a rapid screen, which is later supplemented by a more in-depth data quality evaluation for candidate datasets that pass through this first screen.

The results of the screening process should be fully documented. For datasets that pass the screen, the documented information may be useful input to the subsequent quality evaluation. For those that fail the screen, documentation provides rationale for the rejection of the data sources, which may be reviewed as part of the verification process.

Due to the large variety of datasets used in LandScale assessments, LandScale does not prioritize, rank, or score the relative importance of the different screening criteria. The assessor is given discretion to screen candidate datasets based on the criteria and considerations provided below and others that may be important to the assessment context and candidate data sources.

Table 13: Dataset Screening Criteria and Considerations

Criteria	Considerations
<p>1. Relevance/fitness: The dataset should be thematically relevant to the indicator(s) and performance metric(s) that it is intended to measure. Thematic relevance need not necessarily mean that the dataset provides a direct and full measure of a given metric. When this is not possible, data sources that provide proxy measures or partial measures may still be considered relevant and fit for use for the metric or an acceptable alternate metric. For instance, to measure a metric on work-related injuries or deaths developed to measure indicator 2.2.3 Workers’ rights, the assessor may choose a proxy dataset that tracks safety complaints at a workplace if data that provide a direct measure of the metric are not available.</p>	<ul style="list-style-type: none"> • For proxy datasets, consider how closely they align with the metric. • For details on processing available secondary data to ensure fit, see the subsection on processing data and assessing metrics.

2. **Reputability and Documentation:**

- Assess the reputability of the developer of the dataset by ensuring that the data was collected and assembled using accepted methods. Additionally, ascertain whether the developer has a conflict of interest or inherent bias that may call the validity of the data into question. Preferably, the developer should have a track record of developing unbiased, high quality datasets.
 - Assess reputability of the provider of the dataset by ensuring that there is no indication of intrinsic bias or conflict of interest in furnishing objective information on the given subject. Preferably, the provider should have a track record of providing unbiased, high-quality datasets.
 - Assess whether the dataset includes adequate documentation and accompanying metadata that explain the data fields and attributes, describe the data collection methods, and identify all data quality limitations and disclaimers. Documentation should be sufficient that any user may adequately evaluate data quality with a reasonable degree of confidence.
- The assessor should review the documentation to determine whether the data source reflects reasonable attention to accuracy, precision, and quality control.

3. **Spatial extent/coverage:** Datasets that cover the entire landscape are generally preferred. However, when there is no single dataset with complete landscape coverage for a given metric, the assessor may combine multiple datasets that each cover a part of the landscape. This approach may be necessary when the designated landscape boundary (e.g. a municipality) does not correspond to the units of measurement for a given metric (e.g. water-related outcomes that are measured at the catchment level). When multiple datasets with partial spatial coverage are to be combined, special care should be taken to ensure these multiple sources are comparable and can be combined to create a coherent picture for the entire landscape.

Spatial gaps: Geospatial data based on remote sensing may include data gaps due to cloud cover or other reasons. Based on the size and location of these gaps, the assessor should judge the degree to which the gaps might adversely impact the representativeness and overall accuracy of the entire dataset. If the potential impact is significant, the assessor should explore ways to control for, or seek supplemental data for, the “no data” areas, or may need to reject the dataset altogether.

Spatial extent and resolution: There is sometimes a trade-off between extent and resolution. For more on resolution, see Table 14. Data Quality Evaluation Criteria and Considerations.

4. **Temporal characteristics:** Datasets should be current and have sufficient temporal coverage and frequency to assess the metric(s) for which they will be used, as described below.

- Currentness refers to the most recently collected/generated observations within a dataset. As a principle, the data should be current enough that they provide an accurate representation or approximation of the present condition at the time of the LandScale assessment. Thresholds for currentness depend on the nature of the phenomenon being measured, particularly its rate of change in the context of the given landscape.
- Temporal coverage refers to a given time-series dataset's time range, as defined with a start date and an end date. For example, time series data on agricultural productivity may be available from 2000 to 2020. Temporal coverage is most relevant for metrics that include a measurement of change over time (e.g. 1.1.2.1) or that require averaging over a multi-year period to smooth out inter-annual variation (e.g. 1.3.1.1).
- Frequency refers to the interval with which the data developer collects new data and makes updates to an established time-series dataset. For example, data on agricultural productivity may be collected, processed, and published once each year, or once every two or three years. Appropriate frequency of updating will depend on the metric.

The relative importance of each of these temporal characteristics depends on the nature of the measurement for each given metric; see the metric descriptions in tables 5-12 for more detail.

Additionally, the assessor should consider potential trade-offs between temporal characteristics and other data suitability considerations. For instance, while the most current data is typically the most desirable, there may be trade-offs with other characteristics such as spatial precision and thematic disaggregation. In some cases, an older dataset may be superior, for instance in a landscape with little conversion of natural ecosystems, it may be preferable to use an older ecosystem map that provides higher spatial resolution and a more finely resolved ecosystem typology than a more recent map that lacks these qualities.

<p>5. Accessibility and cost: In general, it is preferable to select data sources that are in the public domain and may be referenced in LandScale assessment reports and examined by any interested user of LandScale assessment results. However, in some cases, the best datasets may be proprietary or confidential. If this is the case, the dataset may be used only if its source and attributes may be reviewed by the assessor and verifier to a sufficient degree to determine that they are reliable and fit-for-purpose for the metric(s) they are intended to measure.</p> <p>If the assessor identifies candidate datasets that are available only for a fee, it may be necessary to weigh tradeoffs between cost and data quality to produce the highest quality assessment within the level of resources budgeted for the assessment. It is advisable for LandScale assessments to include a budget for data procurement, as some expenditure on data is usually necessary. It may be prudent for assessors to review the overall list of candidate data sources that require expenditure and determine how best to spend the available resources to optimize data availability and quality across all indicators and metrics.</p>	<p>If the best dataset for a given metric is proprietary or private, the assessor should investigate whether a data sharing agreement or other arrangement would enable use of the data in a manner that satisfies the data owner’s needs while enabling the necessary LandScale quality reviews and verification. Note that LandScale does not publish source data but source data may need to be made available for level 2 verification to support claims.</p>
<p>6. Disaggregation – The dataset should include at least the degree of disaggregation called for within the metric description and associated explanation in tables 5 - 12. When possible, assessors should prioritize datasets that also include recommended forms of disaggregation (e.g. disaggregation by additional demographic characteristics, as specified in several of the human well-being metrics).</p>	<p>If the assessor identifies secondary datasets that provide insufficient disaggregation but are otherwise suitable, before eliminating the data it may be worth inquiring with the data provider to see whether disaggregated data are available. Sometimes data providers publish only aggregated data but may have disaggregated source data available upon request or by special arrangement.</p>

As the outcome of the screening process, the assessor should document: a) whether each candidate data source passes or fails the screen; and b) the considerations used to make this determination, i.e., the assessor's judgment regarding the above-listed six criteria plus any additional criteria that the assessor considered. This documentation will need to be made available for the verification process.

4.2.2.3 Identify dataset gaps and plan to fill them

Following the conclusion of the initial screening process and subsequent data quality evaluation (see below), the assessor should determine whether there are suitable data for all metrics that are required or were optionally selected to include in the assessment scope. If any metrics lack a suitable data source, then the assessor should determine which of these data gaps need to be filled immediately (i.e., to be able to complete the present assessment) and which should be the subject of a longer-term plan to fill in time for future assessments.

LandScale allows assessors to defer a certain proportion of indicators to a later assessment if there are data gaps (see section 4.4 completeness of assessment). Gaps must be filled to the extent necessary to meet the completeness requirements, or if data are lacking for specific indicator(s) or metric(s) about which the user wishes to make claims. Otherwise, gaps may need to be filled subsequently to meet completeness requirements for follow-on assessments, which become progressively more stringent.

Assessors have several options to fill data gaps. These should be used in the most effective possible combination based on the nature of the gaps and the options available to identify or procure additional data in the given context:

- Conduct a more intensive search for available secondary data from the types of sources identified above and in the Pillar Resources
- Consult local subject matter experts to generate ideas and discuss options for filling data gaps
- Use modeling approaches to generate data relevant to the given metrics based on other input data
- Collect primary data – as described further in the following subsection

4.2.3 Collect primary data, if needed

In the context of LandScale, primary data are data collected within a given landscape for the purpose of conducting a LandScale assessment. Primary data need not be collected for the exclusive purpose of conducting a LandScale assessment. For instance, the collection of primary data for use in LandScale assessments may come about through participation in collaborative monitoring or data collection efforts for the subject

landscape or over larger areas, and it may address purposes and incorporate data themes that go beyond those directly relevant for LandScale. However, LandScale does not consider primary data to include data collection efforts by others where the assessor or participants in the LandScale assessment process have no input on how the data is collected. Data resulting from such efforts should be considered as secondary data.

If primary data will be collected for a LandScale assessment, assessors should consider the points in the following three subsections.

4.2.3.1 Determine feasibility for primary data collection

When the need for primary data collection is identified, careful consideration must go into the resources and capacity of the LandScale assessment team to undertake what can be a long, complex, and expensive process. For these reasons it is highly recommended to develop collaborative partnerships for data collection. Most likely if the data is valuable for a LandScale assessment, it will also be valuable to other actors in the landscape. After identifying the scope of a potential primary data collection effort (e.g., geographic area, thematic focus, data collection methods, and sampling scheme) and potential partners, the assessor should determine feasibility of the data collection effort, considering relevant constraints such as budget, timing, access to study subjects or areas, and others. If the effort is judged likely to be feasible, then further planning should be conducted.

4.2.3.2 Develop data collection plan

LandScale will add links to primary data collection methods and tools to the Pillar Resources on an ongoing basis. General recommendations for identifying suitable data collection methods include:

- Where available, follow accepted methods and standards from the disciplines associated with such data collection.
- Engage local, regional, or national subject matter experts to the extent possible. These experts may be able to help guide, design, advise, and perhaps even conduct the data collection.
- Search peer-reviewed literature, professional guides, academic textbooks, and other sources for standard and commonly accepted data collection methods. In some cases, survey instruments, questionnaires, and other methodological elements can be adopted or adapted from prior work rather than needing to be created anew. Some examples include:
 - For guidelines on household survey design and implementation, see the [International Household Survey Network](#).

- For a guide on theory and methods for evaluating environment and development projects, see this resource published by the [Institute of Development Studies](#).
- Consider the timing of data collection based on the phenomena being observed: for example, seasonal phenomena influenced by weather patterns, hydrological cycles, and or annual cycles of human economic activities might be observable only at certain times of the year or might require repeat measurements to accurately document.

4.2.3.3 Collect and document primary data

Primary data collection processes should be thoroughly documented (including survey instruments, sampling schemes, other methodological details, and metadata) so that others can evaluate resulting data quality and fitness, especially verifiers.

4.2.4 Evaluate data quality

Once candidate data sources pass the initial screening, they must be evaluated for technical quality before they may be used for the LandScale assessment. This process provides a more in-depth evaluation of suitability and helps the assessor select the most suitable data source(s) in the event that there are multiple candidate sources for a given metric. If LandScale assessment results are to be used to support claims, data quality will be the key determinant of whether a claim can be supported, with or without caveats. To make this determination, verifiers will follow the same evaluation criteria as the assessors as described below. For this reason, primary data must also be characterized according to data quality criteria.

Data quality should be evaluated based on the accuracy, reliability, and interpretability of the dataset to furnish the quantitative and/or qualitative information required to assess metric(s) for which they will be used. When multiple datasets are available for a given metric, the assessor should choose the best one(s) according to the criteria. If only a single dataset has passed the screening step for a metric, it is still necessary to evaluate the data in order to determine if it is of sufficient quality to evaluate the metric. In addition, it is necessary to document and report any data quality limitations or caveats to interpreting assessment results or making claims.

The following table outlines criteria and considerations for assessing data quality. When more than one dataset is available for a given metric, it may be necessary to weigh trade-offs to determine the best dataset(s) to use. For example, the assessor may need to decide whether to use an older map of ecosystem types that is superior in terms of its classification scheme (e.g. greater number of ecosystem types) and spatial resolution (e.g. 30m x 30m) or a newer global map that is more current but distinguishes fewer ecosystem types and has coarser resolution. Choices such as this often-present

judgment calls that the assessor should make based on the specific needs for the assessment, the importance of currentness vs. other characteristics (e.g. based on how quickly conditions are changing in the landscape), and the complementarity and gaps among the overall collection of datasets that will be used for the assessment. In some cases, it may be possible to combine datasets and incorporate the best features from each in order to generate a more robust composite set of information for a given metric. For example, an older but more detailed ecosystem map could be updated by overwriting newly converted areas that are identified in a recent land-use or land-cover map.

The assessor should evaluate all candidate datasets that have passed the initial screening based on the criteria and considerations in the following table. As a result of this evaluation, combined with findings from the screening process, the assessor should document one of the following three determinations for each dataset:

- 1) Suitable to use in the assessment with no significant caveats or limitations - in this case, the assessor should document the findings related to the criteria and considerations that led to this determination.
- 2) Suitable to use in the assessment but with some caveats or limitations - in this case, the assessor should describe the caveats or limitations to the quality, reliability, or interpretability of the data source to evaluate the metric(s) for which it will be used. These caveats or limitations (or a summary thereof) will be published alongside the result for the corresponding metric(s) and, depending on the nature of the caveats or limitations, may restrict the scope or phrasing of associated claims.
- 3) Not suitable to use in the assessment - in this case, the assessor should describe the reasons for the determination of “not suitable,” including the way(s) in which the dataset fails to fulfill one or more criteria and considerations.

The above-mentioned documentation provides an important input to the verification process; see LandScale Verification Mechanism for more information.

Table 14. Dataset Quality Evaluation Criteria and Considerations

Criteria	Considerations
<p>1. Spatial resolution – Data must be of sufficiently high spatial resolution to measure status and/or trends for the metric(s) for which it is used. Generally, this entails no coarser than 100m resolution (and ideally 30m or better resolution) for land-related metrics derived or informed by remote sensing or land-use/land-cover maps. For human well-being and governance indicators, this entails datasets that are resolved to the landscape or sub-units within it, or to corresponding comparably sized areas such as municipalities. Additional spatial resolution criteria may be specified on a metric-by-metric basis; see tables 5-12.</p> <p>Where data does not meet these criteria, the assessor should strive to use data with the best available spatial resolution and should document the spatial resolution limitation of the dataset used. In some cases, data may be down-scaled to the applicable area of analysis (e.g. by using a credible analytical model to estimate landscape-level characteristics based on characteristics of a larger area in which the landscape is situated).</p>	<p>Down-scaling may be a legitimate method for estimating characteristics of the landscape based on the characteristics of a larger spatial area in which it is situated if the landscape possesses similar characteristics as the broader area or if the assessor can credibly model landscape characteristics based on highly predictive co-variables (e.g. population characteristics). If neither of these is true (e.g., if data exist only for a province that is much more varied or contains a much higher proportion of urban residents than the landscape) then down-scaling is unlikely to be an appropriate way to address shortcomings in spatial resolution.</p>

2. **Temporal characteristics** — a dataset must offer sufficient temporal resolution and consistent data collection over time, if comparable time series data are required for a given metric. Additionally, newer datasets are generally preferred over older ones, as described below:

- **Temporal resolution:** a dataset must be of sufficiently high temporal resolution to measure status and/or trends for the metric for which it is used. The appropriate temporal unit of measure (e.g., daily, monthly, or annually) will depend on the metric.
- **Consistent collection over time:** to reflect true trends meaningfully, time-series data must be collected with sufficient consistency. For instance, to accurately characterize seasonal and interannual precipitation patterns and trends, rainfall data must be collected in the same way each day for many years.
- **Newer datasets:** when more than one candidate dataset is available, preference should be given to newer datasets as a better representation of the present condition in the landscape.

Expected updates: to support future assessment updates, preference should be given to datasets with planned future repeats or updates, preferably on a frequency compatible with LandScale's recommended update interval.

3. **Sampling and representativeness** – for any dataset that uses sampling and statistics to infer values for a population, the assessor should evaluate the sampling frame to determine whether the dataset was generated using an appropriate sampling design, methods, and sample size. What constitutes “appropriate” will depend on the metric, the degree of heterogeneity for this metric within the landscape, and good practices for collecting data on this metric. Considerations include:
- **Sampling frame:** for the given parameter, assess how well the selected sample group represents the population. When the population is more heterogeneous, an intentional (nonrandom) sampling design and/or a larger sample size are usually required for the sampled population to be sufficiently representative.
 - **Sampling design and methods:** assess whether the data developer’s sampling methods (e.g., random, systematic, stratified, or convenience sampling) sufficiently control for bias.
 - **Sample size:** assess whether the sample size is large enough to provide reliable results with sufficient statistical power and precision. Assess whether co-variables have been properly considered in the sampling method, stratification, and analysis.

Reputable data developers and data providers will provide the needed information in the dataset documentation to enable the assessor to evaluate quality of sampling and representativeness. In addition, the assessor may conduct some data exploration and calculate summary statistics to validate the descriptions provided. No sample-derived dataset is a perfect representation of the full population, and assessors must be sure not to process such data beyond their limits of credible inference.

4.2.4.1 Revisit prior steps

Depending on the outcomes of the data screening and data quality evaluation, the assessor may need to revisit prior steps to expand or improve the array of data available for the LandScale assessment. The assessor should consider and pursue the following options as necessary to secure suitable data for the selected LandScale metrics.

- If results of the quality evaluation reveal that any candidate dataset(s) are not suitable, consider if they can be improved through data processing or modeling (see examples in the preceding sections).
- If results of the quality evaluation reveal that any candidate dataset(s) are not suitable and cannot practically be improved, consider revisiting the data search

process and consulting local experts to see whether there might be additional promising data sources.

- If data sources have already been exhaustively searched, consider collecting primary data.
- If several required and otherwise suitable datasets exist but a particular portion of the landscape lacks data, consider revising the landscape boundary to limit assessment to the area that has consistent, suitable data.
- If no practical way exists to fill a data gap (e.g., through modeling or primary data collection), revisit metrics to determine if an alternate metric can be devised with available data to meet the indicator requirements.
- If there is no practical way to measure a metric that is not required (i.e., it is “recommended” for a required indicator or is for a non-required indicator), defer the evaluation of this metric until a later assessment.
- If there is no practical way to measure a metric that is required, defer its measurement in accordance with LandScale’s allowances for deferring a percentage of indicators (see section 4.4 completeness of assessment).

4.2.4.2 Document data gaps and limitations

Many assessments will encounter data gaps that cannot feasibly be filled, especially during the initial assessment. Data gaps related to any indicators and metrics within the assessment scope must be documented and justified by explaining the data identification, screening, and evaluation steps taken and how outcomes of those steps resulted in the data gap.

For data that are determined to be of sufficient quality to use in the assessment, the outcomes of the data screening and quality evaluation processes, as well as any caveats or limitations identified through these processes, should be documented as described in the above steps of the data journey and per the outputs subsection below. Gaps and limitations should also be used to inform the assessor’s description of any general limitations to the assessment (i.e., beyond limitations with specific data, metrics, or indicators), which must be included in the assessment report.

4.2.5 Processing data and assessing metrics

Once suitable data have been gathered, they will likely need additional cleaning and processing to derive metric values that can be included in the LandScale assessment. Assessors should anticipate carrying out some or all of the following activities to clean, process, and analyze data and to use the resulting processed data to calculate metric

values. Not all activities will be required for all data and metrics, and in some cases, assessors may need to conduct additional activities that are not in this list:

1. Integrating data from multiple sources
2. Classifying and coding data
3. Reviewing, validating, and editing data
4. Transforming data values or attributes
5. Imputing any missing data values, if possible
6. Deriving new variables and their values based on the source data
7. Calculating descriptive statistics, such as averages and distributions
8. Calculating quantitative measures of trends or rates
9. Assigning variable weights and calculated weighted averages or sums
10. Disaggregating data by appropriate variables and calculating metric values according to these disaggregations
11. Finalizing data files

Datasets vary widely, so the data cleaning and processing needs will likely vary widely depending on the metric and the nature of the data. It is therefore not appropriate for LandScale to provide prescriptive guidance for each of these activities for all metrics. Where specific data processing and analysis steps or methods are noted in the metric guidelines (tables 5 - 12), assessors should adhere to these (if required) or follow them to the extent possible (if recommended). LandScale also provides additional recommendations on data cleaning, processing, and analysis in the Pillar Resources. These range from simple process suggestions to resources providing advanced modeling tools and published methods. Some general recommendations for deriving metrics are:

- Simpler methods for transforming data will be easiest for others to understand and should be used if they provide suitable metric values.
- Carefully research and consider the requirements to conduct more sophisticated processing and modeling, relative to the assessment team's level of expertise and capacity.
- Ensure that processing methods and limitations are well-documented to ensure that relevant stakeholders understand and apply the results appropriately in their

decision-making, and that assessment verifiers understand quality implications when verifying claims (see section 4.4.1 data documentation).

Note that if the assessment is using proprietary data that are subject to confidentiality provisions, then the assessor should ensure that the reported metric values and supporting documentation abide by these provisions. For example, if the confidentiality provisions require maintaining the anonymity of individual land units and people within the landscape, then the analysis and processing steps must generalize and anonymize the spatial and non-spatial data in a manner that does not reveal identifying information such as exact geographic locations of features, names, and the like.

For social data, if any personally identifiable information is contained within a given dataset, the assessor must anonymize this information in order to protect participants' privacy, safety, and rights. Consider using a set of unique ID numbers specific to the assessment in place of names or government ID numbers. All reputable secondary datasets should already protect personally identifiable information within social datasets. The assessor may check to ensure that no sensitive information or directed identifiers are included within secondary data. Refer to this International [Household Survey Network resource](#) for details on ensuring data privacy/protection.

4.2.5.1 Assessing performance against targets and milestones (optional)

If landscape performance targets and/or milestones have been established (which is optional – see section 1.2.1 goals and targets), these may be reported alongside the values for each corresponding performance metric to indicate the status or progress of landscape performance relative to the targets and milestones. This is typically a straightforward process for quantitative targets, for example:

- As of 2021, the landscape has a cumulative total of 560 ha of land under restoration management. The sustainable landscape partnership aims to achieve 1,000 ha of land under restoration by 2025 and 3,000 ha of land under restoration by 2030.
- The distinct government set a target of zero deforestation by 2025. As of 2021, the rate of deforestation was 177 ha per year, averaged over the past three years.

Qualitative targets and milestones will require a qualitative and interpretive approach to their assessment.

Box 11: Pilot Experience: Framing Landscape Metrics in the Context of Landscape Targets as Part of the Pilot Landscape Assessment in Lamas, Peru

In the pilot LandScale assessment in Lamas, Peru, once the assessment team from Rainforest Alliance finished collecting data, they carried out an analysis to interpret the

results, which involved a "traffic light" rating system to evaluate each indicator's performance in relation to a goal or range. The process involved establishing ranges or points of reference for each of the 44 performance metrics selected. The team considered two options to define these: (a) using previous assessments in other landscapes or areas in the country as a reference, or (b) developing appropriate target values based on the guidance provided by government officials or experts. Since several government plans already included goals, but no previous assessments were available, the team went with the latter option.

The assessment team categorized the metrics that required urgent action to meet the goal as red, the metrics that needed attention as yellow, and those that did not require any action as green.

The team found predetermined ranges in government reports for some of the metrics, but when this was not the case the team considered two alternatives: (a) to define ranges based on reference information available or their understanding of the landscape context, or (b) to break down existing values in three ranges. An example of the latter case was the metric on total of deforested area, for which the team used the 2018 value (which equals 14,921 ha) to define three ranges: optimal/green for 0-20% of the 2018 baseline value (0 to 2,284 ha), potentially critical/yellow for 20%-60% of the baseline (2,284.2 to 8,953 ha), and critical/red for 60-100% of the baseline (8,953 to 14,921 ha). These ranges were defined based on the team judgment.

After classifying the results accordingly, the team determined that 13 of the 44 performance metrics were in critical status and labeled them a high priority. The government and stakeholders will use these results to prioritize action and resources.

4.3 Completeness of Assessment

A complete LandScale assessment is one that assesses all required metrics based on adequate data for all core and applicable landscape-dependent indicators, and that follows all other applicable LandScale requirements. While full completeness is desirable, in practice it might not be possible due to gaps in data availability or other constraints, especially for the first assessment in any given landscape. For this reason, LandScale assessments are still able to obtain the status of "Completed Assessment" and users may still be eligible to make public claims related to verified assessment results if the assessment meets the following thresholds for completeness, which increase for each progressive assessment to foster improvement over time:

- First assessment: up to 25% of required (core and applicable landscape-dependent) indicators may be omitted, but no more than 50% of required indicators in any individual pillar may be omitted.
- Second assessment: up to 10% of required indicators may be omitted, but no more than 25% of required indicators in any individual pillar may be omitted.

- All future assessments: all required indicators must be assessed and reported.

In instances where one or more indicators are omitted from the initial or second assessment, LandScale users should clearly document the constraint(s) and describe how the indicator(s) will be incorporated into future assessments.

4.4 Outputs of Step 4

Following are the required and recommended outputs for step 4. For the organizations piloting LandScale version 0.2, these outputs may be documented in the reporting template provided.

Required

- Final metric selection and documentation table (see template)
- Data documentation per below section
- If applicable: Documentation of methods for primary data collection
- If applicable: List of targets and milestones associated with the metrics within the assessment scope.

4.4.1 Data documentation

Following is a summary of the data documentation required for step 4. See the preceding narrative for more information on items 2-6:

1. Summary of candidate sources: name (or brief description) and source of all data gathered for consideration in the assessment. This should include not only the data sources that were ultimately used but also any additional data sources that were evaluated for fitness and rejected.
2. Documentation of the data screening process.
3. Documentation for any primary data collected.
4. Documentation of the data quality evaluation process, including any caveats or limitations identified through this process; also, if any data are covered by data sharing agreements, such agreements' limitations should be summarized.
5. Documentation of the steps taken to clean and process the data and to derive the metric value(s) from it.

6. Explanation and justification of any data gaps as well as plans to fill gaps to enable assessment of all applicable indicators and metrics in future assessments.

The assessor may combine or integrate the documentation of these elements; for example, the results of the data screening and data quality evaluation process may be presented as a single assessment of data suitability with the resulting determination. The documentation should be organized by indicator and metric in a clear format that can be readily used for the verification process.

STEP 5

Reporting Results



5 Reporting Results

The culmination of the assessment process is reporting the results. In this step the assessor will:

1. Finish populating the reporting template: update any prior sections that were revisited from the data journey and add synthesis and interpretation of the metrics' results for each indicator and, optionally, each pillar.
2. Create a user-friendly narrative report that may contain additional information, graphics, etc. (optional)
3. Conduct a review of the draft report with stakeholders and or external experts (optional but strongly encouraged to help validate and improve the report before it is submitted for LandScale verification).
4. Conduct a final review by stakeholders and or external experts and report a summary of comments received and responses to them. This final review will be required to publish the report on the LandScale online platform (to be released along with version 1.0).
5. Submit all documentation to LandScale for a completeness check (level 1 verification, which is required to publish the report on the LandScale online platform and a prerequisite for undertaking the level 2 verification that is necessary to make claims).

5.1 Reporting Assessment Results

The assessor is encouraged to populate the reporting template as steps 1-4 are carried out. In step 5, the report will be checked for completeness and accuracy. If prior steps were revisited in the step 4 data journey, documentation of those revisions must also be incorporated (e.g. if limitations on data availability resulted in a decision to select some different metrics, the final set of metrics must be updated and the reasons for excluding previously considered ones should be documented).

For LandScale version 1.0, the template will be incorporated in the planned LandScale online platform and content will be automatically aggregated into a basic report. Assessors are also encouraged to incorporate the content into a more user-friendly and customized report that can be augmented with additional information, graphics, and maps.

5.1.1 Synthesis and interpretation

The reporting template prompts the assessor to provide interpretation of the results and synthesize metric values to demonstrate performance at the indicator level and, optionally, at the pillar level. Effectively communicating LandScale results requires more than simply providing tables of metric values. Interpreting information from the results will provide greater insight; for example: communicating whether the pace of restoration is commensurate with the pace of ecosystem conversion and degradation, is far more informative than simply reporting hectares of restoration actions. Interpretation provides context to the quantitative and qualitative metric values, particularly if the results are counter to those expected or suggest impacts from events outside of the immediate control of the landscape initiative, such as a natural disaster, an extended drought, or impacts to human well-being indicators associated with large-scale demographic shifts such as a sudden influx of refugees.

Where appropriate, assessors should look to synthesize information from multiple metrics to characterize performance at the indicator level. For example, characterizing human health and nutrition (indicator 2.1.2) through synthesis of information across its three metrics can make the results more relevant and actionable for landscape actors. Pillar-level synthesis (optional) can be informative at the executive summary level to paint a broad picture of sustainability performance across the landscape.

If the assessor reported landscape targets or milestones and evaluated metric values in relation to these (optional; see step 4), then interpretation of these relationships is especially important to put the landscape’s current performance and recent trends in the context of the desired sustainability outcomes defined by landscape stakeholders.

Box 12. Pilot Experience: Example Pilot Assessment Results

The following are examples from each pillar of the interim results from the Ghana and Costa Rica pilots using version 0.1 of the assessment framework. This work was conducted in late 2019 and early 2020. In the table below, results are presented by pillar, indicator, and metric with the justification for each indicator included under the column entitled “Indicators/relevance.”

Ecosystems Pillar (Ghana)		
Indicators/relevance	Metrics	Results

<p>1.1.3 Ecosystem restoration</p> <p>Relevance: On-farm tree planting occurs in agroforestry systems across the landscapes; however, there is a need to know how much restoration has been undertaken at the landscape level.</p>	<p>1.1.3.1 Restoration rate (ha/yr), disaggregated by restoration type</p>	<p>Kakum HIA landscape: 998 ha/year</p>
<p>Human Well-Being Pillar (Ghana)</p>		
<p>2.1.1 Poverty</p> <p>Relevance: The communities in both landscapes have medium rankings of poverty incidence across the country.</p>	<p>2.1.1.1 Percentage of population living below national poverty line (GH¢1.3/day or \$0.67/day)</p>	<p>Kakum HIA landscape: 24.1%</p> <p>Juabeso Bia HIA landscape: 14.1%.</p>
<p>Governance Pillar (Costa Rica)</p>		
<p>3.2.3 Stakeholder participation and inclusion</p> <p>Relevance: Indicator was required as a core indicator.</p>	<p>3.2.3.1 Percentage of stakeholder groups formally represented in multi-stakeholder committees or other mechanisms for coordination, input, and agreement</p>	<p>Considering the two land-use planning mechanisms (Agua Tica and Commission for Watershed Integrated Management), 66% of stakeholder groups are represented in either one or both mechanisms.</p>
<p>Production Pillar (Costa Rica)</p>		
<p>4.1.1 Agricultural, Agroforestry and Tree Plantation Productivity</p> <p>Relevance: Included was required as a core indicator for version 0.1.</p>	<p>4.1.1.1 Average crop productivity (yield/ha) for key crops</p>	<p>Coffee: 0.78 ton of green coffee/ha</p> <p>Sugar: 6.89 ton/ha</p>

5.1.2 Repeat assessment reports

Repeating assessments to detect change over time is a key part of the LandScale approach. Synthesis and interpretation should recap previous assessment results, explain current results, and provide detailed interpretation of changes in metrics. Interpretation may include important caveats for changes that may be due to (for example):

- Changes in data quality in the most recent assessment (e.g. the reported amount of a given ecosystem type changed only because the data are more precise rather than due to conversion or restoration)
- Events or phenomena outside the control of the initiative or local organizations and stakeholders such as natural disasters, global economic downturns, influx of refugees, etc.
- Subsequent changes in the LandScale framework that affect reporting of change (e.g., indicators or metrics dropped, added, or revised).

In the future, as landscapes approach the date of their first repeat assessment, the LandScale reporting template provided as part of the online platform will be expanded to facilitate clear and consistent reporting of current results in relation to the results of prior assessments, and to present trends over time.

5.2 Reviewing Assessment Results

This subsection addresses review by partners, stakeholders, and experts of draft results to improve the outputs of the assessment; and of final results to validate the results and conclusions of the assessment. The review of the draft assessment is recommended (to provide assessors the opportunity to improve the product prior to obtaining final report review) while the review of the final assessment is required. These reviews are separate from the verification process, which is described in the LandScale verification mechanism. Partner and stakeholder input are recommended throughout the assessment process and should facilitate understanding of and agreement with the final results. However, it is not expected nor required that every stakeholder will concur with every result or interpretation.

Expert “peer” review should be sought in addition to stakeholder review, and it is required if the assessment did not involve significant stakeholder participation. For a LandScale assessment to be rated as complete and published on the planned LandScale online platform (a prerequisite for verification and claims), a summary of stakeholder and/or expert review comments on the final report and assessor responses must be included as an appendix to the report.

The assessor should document the responses to comments from the draft review (e.g., if a correction was made, if a comment is valid but a correction was not feasible or was out of scope, etc.). For comments on final reports (required), responses should address whether the comment represents a true limitation of the assessment, is not valid (in which case the assessor should explain why not) or is valid but is out of scope for the assessment. All those contributing to the assessment, including review, should be acknowledged in the report.

Box 13. Pilot Experience: Collecting Feedback on Assessment Results in Costa Rica

The assessment results in Costa Rica were intended to be used to develop an action plan for the landscape stakeholders. For this reason, the assessor (IUCN) presented the results of the assessment through two workshops to key stakeholders. Workshops were conducted with members of the Agua Tica Water Fund and representatives of civil society groups and coffee and meat producers. The goal of the workshops was to collect stakeholders' feedback to improve the results and outline and discuss the next steps.

The stakeholder feedback included recommendations of alternative data sources to fill data gaps and identified different ways the assessment can help them achieve their goals. Once the workshop attendees' feedback was collected, the results were shared via email with non-members and coffee cooperatives that could not attend.

IUCN, as well as a representative from Agua Tica, also used the workshops to discuss how the results could be used to support specific needs and interests (i.e., to engage with other actors in the landscape, to understand their contributions to landscape sustainability, to access new markets, more funding and market incentives, etc.)

5.3 Outputs of Step 5

Following are the required and recommended outputs for step 5. For the organizations piloting LandScale version 0.2, these outputs may be documented in the reporting template provided.

Required

- Summary report or executive summary; this is a part of the template but will appear separately in the LandScale online platform
- Populated assessment report template
- Documentation of the stakeholder engagement process for the human rights assessment

- Documentation as an annex of final report review comments by stakeholders and or independent experts and responses by assessor. If draft reviews were conducted, comments and responses may optionally be provided to communicate how the final report was improved based on the input.

Recommended

- Documentation of stakeholder engagement for other aspects of the assessment, to the extent it was conducted
- User-friendly version of the report as a PDF. This is a complete report that draws from the reporting template but may have additional narrative and graphics.

About LandScale

The Rainforest Alliance, Verra, and Conservation International are developing LandScale with support from a growing coalition of partners. To date, partners include the Climate, Community & Biodiversity Alliance, EcoAgriculture Partners, the International Union for Conservation of Nature (IUCN), the Nature Conservation Research Centre (NCRC), Proforest, and Solidaridad.

An advisory group, representing both subject matter experts and potential LandScale users, provides strategic input and guidance on developing the LandScale initiative to help ensure it makes a significant contribution to driving improvements in landscape sustainability. The global initiative is supported by the International Climate Initiative (IKI) of the German Federal Ministry of the Environment, Nature Conservation and Nuclear Safety (BMU) and the BHP Foundation’s Environmental Resilience Global Signature Program. Visit www.landscale.org to learn more.

