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METHODOLOGY GUIDEBOOK

LINKING CAUSE AND EFFECT IN LANDSCAPES

Causality Assessment for Landscape Interventions (CALI)

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Causality Assessment for Landscape Interventions (CALI) -

Methodology Guidebook

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"You're not likely to adapt your *strategy* if you never seriously question whether the *boundaries* you establish are reasonable, whether the *norms* and *values* you espouse are sound, and whether the *pathways* you propose are actually credible.

The whole point of any exercise you choose should be asking yourself difficult questions."

- **Thomas Aston,** evaluation researcher

Acknowledgements

HOW TO USE THIS GUIDEBOOK

How do we learn and adapt when implementing landscape or jurisdictional interventions?

The Causality Assessment for Landscape Interventions (CALI) guidebook was developed to support adaptive management in projects addressing deforestation in one or more specific landscapes and/or jurisdictions.

The methodology proposed in the guidebook provides an integrated, systems-informed approach for project managers and their teams to continuously reflect on the validity of their Theory of Change, with a strong emphasis on unpacking causality between and among different levels of results.

The cornerstone of the assessment is the engagement of key landscape stakeholders as partners, which is aimed to uncover insights on relevant system dynamics, while discussing their role in the project's Theory of Change. The findings of the assessment will allow project managers and their teams to adopt corrective and/or catalysing actions to increase the chances of success of the Project.

An introductory chapter illustrates the rationale that brought to the development of the CALI, presents the specific objectives of the assessment, and provides an overview of the methodology and its limitations.

The following chapter on Prerequisites details the minimum requirements for a Project team to decide to engage in the assessment.

The rest of the guidebook illustrates a detailed process for conducting the assessment at three different stages of the project lifecycle: at project start, during implementation, and after project closure (optional). The authors highly recommend to project teams to engage in CALI at least twice throughout the Project lifecycle: at project start and half-way through implementation. Nevertheless, a Project may also decide to engage in CALI directly throughout implementation; in this case, they should be following the steps in this order: Preparation, 1.1, 1.2, 2.3, 2.4.

At each stage, the steps to be followed have similar purposes and will deliver similar products to inform adaptive management; however, this will happen through substantially different processes acknowledging the level of progress reached, relationships with landscape stakeholders and dynamics, and opportunities to adapt the course of action.

Insights, examples, notes on Experiential Learnings, and Appendices complete the guidebook with critical information for the assessment.

CONTENTS

List of Acronyms

CALI	Causality Assessment for Landscape Interventions
FAO	Food and Agriculture Organization of the United Nations
GGP	Good Growth Partnership
GEF	Global Environment Facility
GHG	Greenhouse Gas
MEL	Monitoring, Evaluation and Learning
NFMS	National Forest Monitoring System
PAMs	Policies and Measures
PES	Payment for Ecosystem Services
RBM	Results-Based Management
REDD+	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RF	Results Framework
ToC	Theory of Change
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme

UNDP GCP	UNDP Green Commodities Programme
UN-REDD	United Nations Collaborative Programme on Reducing Emissions from Deforestation and forest Degradation (REDD+) in developing countries

Key Definitions

Action Research: An interactive inquiry process that balances problem-solving actions implemented in a collaborative context with data-driven collaborative analysis or research to understand underlying causes enabling future predictions about personal and organizational change[1].

Afforestation: increase in forest area due to the planting of trees on land that was not previously forested.[2]

Causal mechanism: a complex system, which produces an outcome by the interaction of a number of parts (Glennan, 1996)[3]. In process tracing (on which the contribution tracing approach outlined in this guidebook is based), a *causal mechanism* is a causally linked sequence of events produced by actors (Bennet and Checkel, 2014)[4]. This is based on Jon Elster's definition of a *mechanism* in the social sciences, as a frequently occurring and easily recognizable causal pattern (1998, p. 45)[5], which may be seen as consisting of entities (actors, organizations) – or the forces engaged in activities, and activities – the producers of change, which transmit causal forces (Beach and Pedersen, 2019, p. 29)[6].

Contributing factors: The indirect forces, policies, behaviours, financing, and/or activities – generally internal to the landscape, but occasionally external – that enable the occurrence of direct drivers and/or serve as barriers to successfully decreasing deforestation. *For example, lack of employment opportunities* or *lack of alternative building materials* or *existence of perverse incentive program* or *population growth* or *lack of access to credit*.

Contribution analysis: a theory-based, methodologically neutral (i.e., not providing clear guidance on how to collect data and assess its strength towards or against a contribution claim) approach to evaluation, aiming to assess the role played by an intervention, or specific aspects of it, in the achievement of one or more outcomes. It requires the creation of a causal chain where each link represents an intermediate outcome. associated with risks that might prevent it from taking place and assumptions that need to hold if the intermediate outcome is to materialize (Befani and Stedman-Bryce, 2017)[7].

Contribution tracing: a methodological approach developed by Befani and Stedman-Bryce (2017)[8] building on principles of Contribution Analysis and Process Tracing. It aims to fill the methodological guidance gap

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[1] Reason, Peter; Bradbury, Hilary, eds. (2001). Handbook of action research: participative inquiry and practice. London: Sage.

[2] FAO, 2020. Global Forest Resources Assessment (FRA).

[3] Glennan, Stuart S. 1996. Mechanisms and the Nature of Causation. Erkenntnis 44 (1): 49– 71.

[4] Bennett, A., and Checkel, J. (Eds.), 2014. Process Tracing: From Metaphor to Analytic Tool (Strategies for Social Inquiry). Cambridge: Cambridge University Press. doi:10.1017/CBO9781139858472.

[5] Elster, Jon. 1998. A plea for mechanisms. In Social mechanisms: An analytical approach to social theory, ed. by Peter Hedström and Richard Swedberg, 45-73. New York: Cambridge University Press.

[6] Beach, D. and Pedersen, R.B., 2019. Process-tracing methods: Foundations and guidelines. University of Michigan Press.

[7] Befani, B. and Stedman-Bryce, G., 2017. Process tracing and Bayesian updating for impact evaluation. Evaluation, 23(1), pp.42-60.

[8] Ibid.

in Contribution Analysis, through making Process Tracing a principle and tests "ready for application in real-life evaluations" (p. 44).

Deforestation: The conversion of forest to other land use, such as agriculture and infrastructure[9].

Direct drivers: *Direct drivers* are the processes or human activities that directly cause deforestation or influence reforestation/afforestation in the landscape. *For example, urban development* or *expansion of the agricultural frontier* or *illegal logging* or *unsustainable harvest of non-timber forest products*.

Enabling Conditions: Contextual circumstances that support the successful implementation of an intervention but are not necessarily intentionally designed or meant to influence forests. *For example, political stability* or *an increase in crop prices* or *adequate precipitation during a specific year* or *the implementation of a national policy not directly focusing on forests (but having unintended impact).*

Experiential Learning: the process of learning through experience; also more narrowly defined as "learning through reflection on doing"[10].

Forest: Loosely defined as a large area covered chiefly with trees and undergrowth.[11] According to the FAO (2020), land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use[12]. For UNFCCC (2005), an area of land of at least 0.05–1 hectare, of which more than 10-30% is covered by tree canopy. Trees must have a potential to reach a minimum of 25 meters at maturity in situ. Parties to the Convention can then choose to define a forest from within those ranges, and, as a result, and in acknowledgement of wide differences in bio geophysical conditions, social structure and economics, many definitions of the term forest are in use throughout the world[13].

Intervention: A cohesive set of activities implemented with the intention of decreasing/mitigating deforestation and/or actively contributing to reforestation. *For example: establishment and implementation of a multi-stakeholder platform* or *promotion of improved practices* or *capacity-building for fire management*.

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[9] FAO (2020). Global Forest Resources Assessment (FRA).

[10] Felicia, P. (2011). Handbook of Research on Improving Learning and Motivation. p. 1003. ISBN 978-1609604967.

[11] Oxford Languages. Accessed through Google browser in November 2020.

[12] FAO (2020). Global Forest Resources Assessment (FRA).

[13] UN-REDD (2016). REDD+ Key Terms Glossary. Accessible at: https://www.unredd.net/documents/redd-papers-and-publications-90/un-redd-publications-1191/technical-resources-series/15902-towards-a-common-understanding-of-redd-under-the-unfccc-glossary.html.

Landscape: A geographical space that results from the interaction between social, ecological, economic, and governability processes,[14] and is most commonly delineated around a specific ecosystem (or ecosystems) and/or delineated along jurisdictional boundaries.

CALI Project team: The team applying the CALI for the Project. Consists of a lead assessor and facilitator, hereafter referred to as "the facilitator," ideally with previous experience in process or contribution tracing, and key Project staff, including an individual with experience in organizing, processing, and visualizing tabular and geospatial data, and ideally with in-depth knowledge of the local information landscape.

Project: The project undergoing CALI.

Reforestation: increase in forest area due to the replanting of trees on land that was previously forested, or due to natural expansion, i.e., when trees grow back on abandoned agricultural or other land[15].

Results Framework: A results framework is an explicit articulation (graphic display, matrix, or summary) of the different levels, or chains, of results expected from a particular intervention — project, program, or development strategy[16].

Sensemaking: The process by which people give meaning to their collective experiences. In organization science, it has been defined as "the ongoing retrospective development of plausible images that rationalize what people are doing"[17].

System: a set of interconnected elements, which together lead to a certain behaviour. The landscape and its appropriation by humans is a good example of a complex system: various elements like food demand, deforestation, public policies, business interest work together and influence each other leading to the developments we are observing in the landscape (increasing food consumption, increasing food production, decreasing forest cover). Socio-environmental systems comprise elements which are physical (e.g., land, resources, workforce) as well as so-called soft factors which represent emotions and attitudes of actors in the system (e.g., aspirations, perceived threats, fear, trust).

Theory of Change: a hypothesis of how and why change happens. Often presented as a mixture of diagrams and narrative summary, according to Vogel (2012)[18] a Theory of Change can be seen as "an ongoing process of discussion-based analysis and learning that produces powerful insights to support program design, strategy, implementation, evaluation and impact assessment, communicated through diagrams and narratives which are updated at regular intervals." Its common elements include an articulation of how

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[14] Minang, P.A., van Noordwijk, M., Freeman, O.E., Duguma, L.A., Mbow, C., de Leeuw, J., and Catacutan, D.E. (2015). Introduction & Basic Propositions. In P.A. Minang, et al. (Eds.), Climate-Smart Landscapes: Multifunctionality in Practice (p. 3-17). Nairobi, Kenya: World Agroforestry Centre.

[15] FAO (2020). Global Forest Resources Assessment (FRA).

[16] IEG, World Bank (2012). Designing a Results Framework for Achieving Results: A How-to Guide.

[17] Weick, K., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. Organization Science, 16(4): 409–421.

[18] Vogel, I (2012). Review of the use of Theory of Change in International Development: Review report. DFID, April 2012.

change happens in a particular context, clarification of the role of an organization in contributing to change, and the definition and testing of critical assumptions (INTRAC, 2017)[19].

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[19] INTRAC (2017). Theory of Change. Retrievable as part of the M&E Universe.

INTRODUCTION

Forests harbor most of Earth's biodiversity, support the livelihoods of hundreds of millions of people (including many of the world's poorest), and provide a multitude of ecosystem services, including climate regulation, flood control, pollution abatement, fresh water supply and soil protection[20].

Nonetheless, forests and the services they provide continue to be under severe pressure: it is estimated that 420 million hectares of forest have been lost since 1990 through conversion to other land uses, with agricultural expansion accounting for the most of this[21].

Landscape and jurisdictional approaches which attempt to address agricultural expansion and the other drivers of deforestation are complex interventions, attempting to combat the interplay of political, economic, and social forces, contributing to changing the forces at play, in conjunction with other efforts. Their Theories of Change tend to include multiple assumptions and risks and rely on many factors working alongside project intervention efforts. As these landscape and jurisdictional approaches are designed and implemented in complex environments trying to pull selected levers for change, implementation teams must be comfortable in dealing with uncertainty, as adaptation becomes a key factor for success.

Therefore, the implementation of landscape and jurisdictional approaches needs to become more reflective and agile, and capable of leveraging insights from implementation, so to adjust interventions in due course and increase their chances of success. This implies engaging in a continuous reflection on what is working and not, calling into question the validity of the Theory of Change (and its assumptions) and its interplay with the complex dynamics driving deforestation in the landscape or jurisdiction.

Objective

In recognition of the complexity of the system dynamics leading to deforestation at landscape or jurisdictional level, and the consequent imperative for project teams to continuously learn and adapt during implementation, the Causality Assessment for Landscape Interventions (CALI) was developed as an integrated tool for adaptive management.

By engaging in the assessment at different key moments in the Project lifecycle, practitioners are guided through a continuous, systems-informed reflection on the causal pathways through which their interventions are contributing (or not) to reducing deforestation at landscape or jurisdictional level[22]; findings will

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[20] Ghazoul, J. (2015). Forests. Oxford University Press.

[21] FAO and UNEP (2020). The State of the World's Forests 2020. Forests, biodiversity and people. Rome. https://doi.org/10.4060/ca8642en.

[22] While the CALI has been developed specifically focused on forest cover and deforestation at the landscape scale, its methodology can be leveraged also to look at impacts on other variables relevant to the landscape around which interventions have been designed and implemented (freshwater or sustainable income, for example).

immediately inform adaptive management, through a facilitated refinement of the Theory of Change and implementation strategy of the Project.

INSIGHT 1: Systemic Approach to Landscape-level assessments

CALI approaches landscape-level analysis through **systems practice**, i.e., the approach of making reliable conclusions about the behavior of a system by developing a deep understanding of its underlying structure. Viewing problems from a system perspective helps practitioners to develop a holistic understanding of the trajectory of current developments and their underlying causes, uncovering the, often hidden, connections and dependencies between actors and sectors, and as such, building bridges between the functional silos.

In daily life, people's attention is usually directed towards single events. Most of the information we see on the news focuses on such single events (e.g., new public policy introduced, illegal deforestation discovered, aggression between actors). However, these events are only snapshots in time emerging from underlying long-term patterns in a system's behavior. In other words, such *events* only represent the tip of the iceberg that is most visible to us (Figure 1). The *patterns* tell us how situations developed and emerged over time (e.g., increasing pressure on government, increasing deforestation, rising tensions between actors).

These patterns of behavior, in turn, are driven by the *structure* of the system, or in other words how various parts of the system are linked and interact with each other. The structure depicts the important drivers behind the developments and might unveil the interconnection between different events and patterns (e.g., increased competition between actors leads to more intense land use and additional deforestation, which in turn was observed by the public, and therefore pressured the government to introduce a new policy). Our decisions to affect the system are based on our understanding of these relationships, i.e., our '*mental models*' of reality. System Practice aims to make these behavior patterns, the system structure, and the mental models which are often implicit and hidden more transparent.

When assessing the effectiveness of development interventions aimed at reducing deforestation at landscape or jurisdiction level, system thinking allows practitioners to complement and situate their project's ToC to consider the full range of relevant outcomes that might have been influenced through their interventions, and how the latter, in turn, are influenced by the complex system dynamics at play in the landscapes. This allows the Project team members to develop a systems-informed understanding of the environment in which they operate, which in turn will help to make more informed decisions and increase the likelihood of success of their interventions.

THE ICEBERG
A Tool for Guiding Systemic Thinking

EVENTS ———————————— React
What just happened?
Catching a cold.

PATTERNS/TRENDS ———————— Anticipate
What trends have there been over time?
I've been catching more colds
when sleeping less.

UNDERLYING STRUCTURES ———— Design
What has influenced the patterns?
What are the relationships between the parts?
More stress at work, not eating well, difficulty
accessing healthy food near home or work.

MENTAL MODELS ——————————— Transform
What assumptions, beliefs and values do people hold
about the system? What beliefs keep the system in place?
Career is the most important piece of our identity,
healthy food is too expensive, rest is for the unmotivated.

Figure 1: A Systems Thinking Model: The Iceberg, Ecochallenge.org.

Through the CALI methodology, Project teams and their interventions are effectively linked to the landscape-level system (and sub-systems) leading to deforestation or land-use change, allowing for a holistic assessment of causality with due consideration of the system dynamics in which they operate.

During the assessment, the following key questions are explored through facilitated, highly participatory workshops engaging the Project team and key landscape stakeholders:

- *Are the planned interventions contributing to reducing deforestation or influencing its key drivers in the landscape/jurisdiction? Does the Theory of Change hold?*

- *How are planned interventions being influenced, in turn, by the complex system dynamics at play in the landscape? Are assumptions holding?*

- *What is needed to strengthen project effectiveness? Are there any gaps in the existing suite of interventions being implemented to achieve the intended impact? Which ones, and how should they be addressed?*

- *Can the results obtained be sustained over the long term? If not, what is needed for this to happen?*

"This effort to establish a rigorous, participatory tool to assess the effectiveness, and potential impact, of projects aimed at reducing deforestation is timely and well-conceived. The CALI methodology makes important advances in assessment design. Especially in its systematic approach to investigate the planned and actual contributions of project interventions to achieving the desired impact".

- Alan Fox, Deputy Director of the Independent Evaluation Office (IEO) of UNDP

Beyond supporting adaptive management, the CALI also provides an invaluable experiential learning experience for the Project implementation team members and key landscape stakeholders, which are engaged in a deep reflection on the interplay between Project interventions and the system dynamics leading to deforestation in the landscape, while also examining their respective, embedded role in the system. Through engaging in the assessment, the Project team in particular will gain a thorough understanding of the Theory of Change of the Project and what they are *really* trying to achieve through the implementation of their workplans and deliverables.

By the end, each application of CALI will result in the delivery of the following products:

- A new or updated landscape system map, focused on the system (and subsystems) leading to deforestation in the landscape or jurisdiction;
- A refined, system-informed Theory of Change for the Project;
- A refined project implementation strategy and results framework for the Project.

The CALI methodology, which will be further introduced in the following section, is fully integrated in the Project lifecycle, and can effectively complement and support more traditional tools and processes for intervention planning, monitoring and evaluation (including midterm and/or terminal evaluations[23]), adaptive management, and stakeholder engagement.

As the use of the methodology grows, it can support learning across sites as more examples come into the public domain.

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[23] Compared to a midterm evaluation, the CALI is fully led by the Project team, highly participatory and promoting experiential learning, and results in actual adjustments to the ToC and project implementation strategy on which the Project team has full ownership (vis-à-vis recommendations from evaluators, who are often only limitedly acquainted with the context). CALI can either provide inputs, substitute, or follow and validate/complement the recommendations of a midterm evaluation.

Overview of the CALI methodology

CALI promotes a participatory, continuous reflection on the effectiveness of Project interventions in reducing deforestation at landscape or jurisdictional level, through a mixed-methods approach based on the analysis of secondary data (from the Project's monitoring system, national forest monitoring systems, academic research, and other studies on the landscape), and the collection and analysis of primary data through facilitated workshops with the Project implementation team and key landscape stakeholders.

With its strong participatory character and utilization-focus, CALI consists of pure action research, and delivers at best in the context of projects that value continuous reflection for adaptive management.

The methodology was designed to be applied under the lead of one Project team, ideally with the engagement of representatives of other organizations implementing interventions in the landscape. However, CALI can also be applied under joint leadership of multiple organizations active in a specific landscape, which could be sharing application costs. Such a modality is particularly suitable for saturated landscapes, with a proliferation of actors and interventions with often limited coordination. In such contexts, CALI provides a valuable framework and systematic approach for bringing key landscape stakeholders and development practitioners together to engage in systemic reflection.

CALI should be integrated as much as possible within a Project schedule for monitoring, evaluation, and adaptive management. A first assessment is recommended at project start, while a second assessment is recommended half-way through Project implementation. Additional assessments are recommended for Projects lasting more than 5/6 years, as, in general, Project teams should aim to conduct the assessment roughly every 2 years. However, the frequency of reapplication is ultimately at the discretion of the team applying the CALI and the donor funding its application, given they will have the best knowledge of how quickly changes are occurring in their landscape, the programme and project cycle, and will need to allocate resources for application.

Although each application of CALI will ultimately deliver the same products (a new or updated landscape system map, a refined Theory of Change and implementation strategy for the Project), the methodology varies substantially between the first application (at project start), the second and further applications (during implementation), and an eventual ex-post application (after project closure), as the Project will find itself in considerably different positions at these stages, in terms of implementation progress, relationships with landscape stakeholders and dynamics, and opportunities to adapt the course of action. This guidebook was designed following this logic, and as such proposes the following four main chapters:

- Prerequisites
- First application of CALI – at Project start
- Second and further applications of CALI – during Project implementation
- Ex-post application of CALI – after Project closure

The prerequisites chapter outlines the cornerstone requirements necessary to conduct the assessment, and as such it should be reviewed thoroughly by any Project team considering to engage in CALI.

With the anticipated variations depending on the stage of implementation reached, each assessment will consist of the following key steps:

- Preparation – *to ensure that all prerequisites are met (or can be met), the CALI project team is in place, and a thorough plan for application is developed;*
- Development or updated of the landscape system map – *to deepen (or update) the understanding of the Project team of the complex system dynamics driving deforestation in the target landscape;*
- Identification of Project impact areas in the landscape system map – *to connect (or update the connection of) the Theory of Change and planned interventions of the Project to the system driving deforestation in the landscape, so to refine the Project team's understanding of the systemic impact sought to be achieved through the Project, and identify any critical gaps or areas of improvement.*
- Review of the Project impact pathways – *to refine the Project impact pathways and implementation strategy, considering their interaction with the complex system dynamics leading to deforestation in the target landscape, through leveraging existing evidence of progress, learnings from implementation, and the situated knowledge of key stakeholders.*
- Adjustments to the Project ToC, strategy and results framework (except for the ex-post application, where findings will feed the design of new projects, or programmatic adjustments) – *to adjust the Theory of Change, implementation strategy and results framework of the Project, leveraging the information gathered through the previous step.*

For each application of CALI, while there is a general flow and process along the abovementioned steps (and substeps), application may not always be entirely linear. There is a good amount of iteration between some of the steps and sub-steps as information is gathered and more stakeholders are consulted.

Important note: the CALI methodology is mainly principle- and results-based and defines a list of products to be developed and used in a certain way to inform adaptive management, through refining critical Project planning documents. These come with a series of proposed steps and sub-steps which can always be adjusted depending on the scope and nature of the Project, and context of application, including relationships among stakeholders and the latter and the Project team. Facilitators and project teams are actively encouraged to bring-in innovation elements and adjust/improve the proposed methods as they see fit.

Figure X below shows the recommended timing and resulting products from each application of CALI, with relation to the project lifecycle.

[develop and insert Figure X]

For each step, the CALI guidebook clearly details:

- Purpose;
- Method;
- Resulting Product/s;
- Suggested Length for in-person workshop.

The steps and sub-steps in the Guidebook were developed with reference to an in-person application, which is the recommended format to maximize the engagement of participants, and, by consequence the validity of results (and ownership of the team on the process!). Nevertheless, virtual and hybrid applications may also be considered, with the due adjustments.

Throughout the guidebook, a number of examples illustrate prerequisites, processes, and the resulting products expected from each step and/or sub-step. The examples come from pilot applications in selected landscapes in

Indonesia, Liberia, Paraguay and Peru, and are just for reference; it is worth noting again that the CALI methodology shall always be tailored to account for different structural and contextual factors, which are specific to each project and landscape.

Throughout the Guidebook, the reader will also encounter several "Insights", which define key concepts that are paramount for the application of CALI, and notes on "Experiential Learning", which outline the intrinsic learning benefits for Project teams and key landscape stakeholders engaging in the assessment.

Limitations and notes on application

A quality application of CALI requires skilled facilitators, with experience with systems practice and action-oriented evaluation of development projects. The collection, interpretation, and processing of findings for the development of final products requires critical thinking and strong analytical and writing skills. The assessment facilitator should also be able to play this role

Most of the assessment relies on the perception and collective sensemaking of the Project team and key landscape stakeholders. Although this is based on the fundamental assumption that these actors have the best insights about the practical working of the system leading to deforestation in the landscape, whenever possible, it is always recommended to triangulate the information collected through this exercise with secondary sources and/or additional primary data collection (validity).

As previously mentioned, findings should obviously always be seen as context-specific (generalizability), although, with the due considerations, they may be used to inform approaches in other, similar landscapes.

PREREQUISITES

This section outlines the minimum conditions that must be met for a Project to successfully apply the Causality Assessment for Landscape Interventions (CALI). These are summed up in table X below.

Table 1: Minimum conditions for a successful application of CALI.

Prerequisite	Purpose
A clearly defined landscape boundary (p. XX)	To focus the assessment on a commonly understood and recognized geography, where the project is aiming to contribute to reducing deforestation.
A thorough stakeholder analysis (p. XX)	To identify the key actors who influence and/or are affected by deforestation in the landscape, so to define the most important stakeholders to engage in the CALI assessment.
A holistic view of landscape interventions and their interdependencies (p. XX)	(i) To identify what interventions were and are currently being implemented in the landscape by the Project to analyze and adjust their impact pathways and implementation strategies. (ii) To identify what interventions were and are currently being implemented in the landscape by other actors and understand their connections with Project interventions to identify synergies and co-dependencies.
An adequate Project monitoring framework and system (p. XX)	For the Project to be able to keep track of the outputs achieved, and the extent to which the expected outcomes are materializing. If well developed, this also allows to test the critical assumptions underpinning the Theory of Change of the Project. This information will be critical to support the Review of the Project impact pathways and subsequent adjustments to the Project ToC and implementation strategy.
Adequate resources for application (p. XX)	To ensure that the Project has the necessary monetary, staffing and time resources for an adequate implementation of CALI.

The Project team should ensure that all the prerequisites are met before engaging with the application of CALI. The following chapters are meant to guide the Project team on how this should be done.

A concluding chapter details *Other desirable preconditions for application* (p. XX). Although not necessary for a Project to engage with CALI, the presence of these conditions would provide notable advantages for carrying the assessment.

A clearly defined landscape boundary

Purpose: *To focus the assessment on a commonly understood and recognized geography, where the Project is aiming to contribute to reducing deforestation.*

The Project team must be able to describe the geographic limits of the landscape, which may or may not coincide with jurisdictional or ecological boundaries, as shown in Figure 3. If relevant, the Project team should also be able to identify where within the landscape the Project is active (in case the Project is not active in the entire landscape). If a geographic boundary is not yet delimited, it should be identified now as a necessary prerequisite for the application of CALI. It is recommended that this information is visualized in a simple map such as the ones shown in Figure 3.

Example

Figure 2: Examples of definition of Landscape Boundaries from Scoping exercise conducted in the Pelalawan district in Indonesia, and the Northwestern Landscape of Liberia.
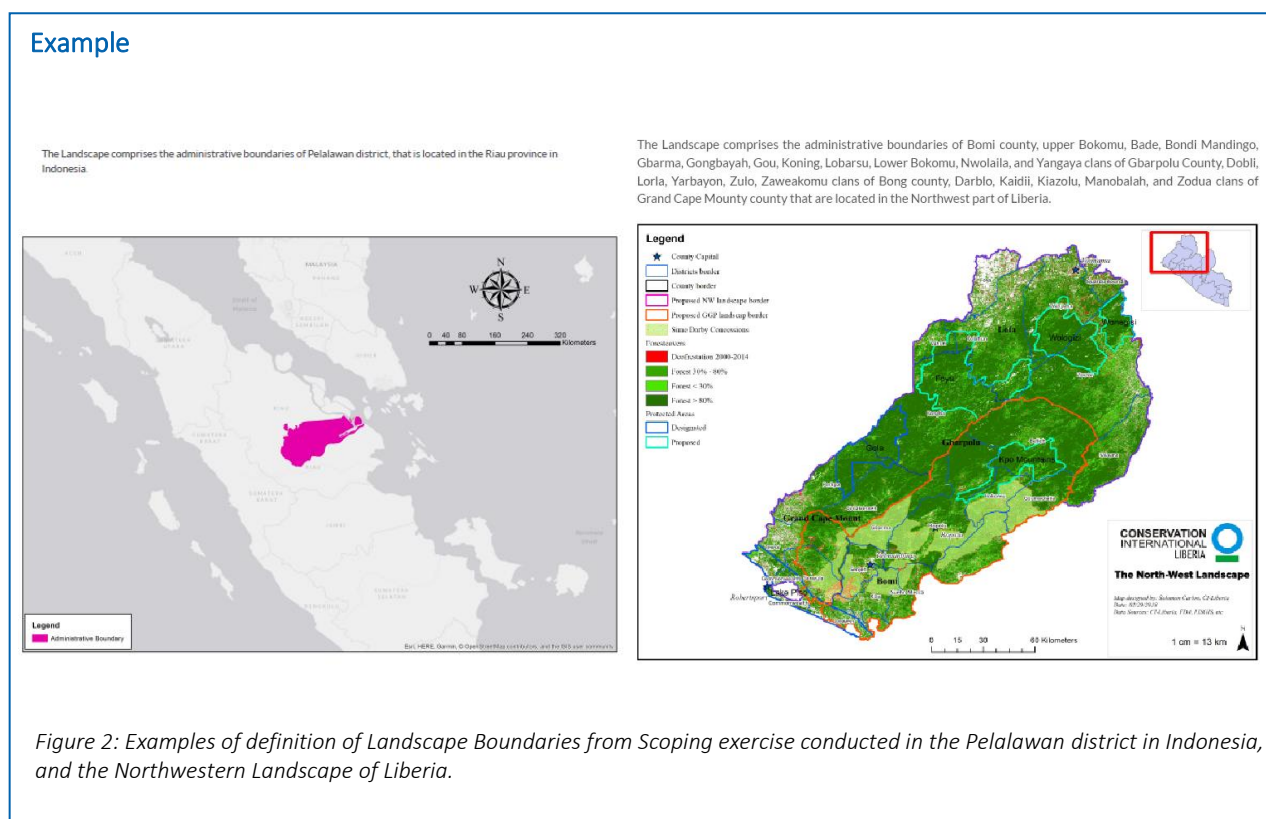
A thorough stakeholder analysis

Purpose: *To identify the key actors who influence and/or are affected by deforestation in the landscape, so to define the most important stakeholders to engage in the CALI assessment.*

Ensuring the participation of key landscape stakeholders (at all applicable scales)is critical for a successful application of CALI (at Project start, during implementation, and after Project end): their situated knowledge is the cornerstone of the assessment, and the validity of the findings relies fundamentally on the Project team's ability to engage the most relevant stakeholders – the ones holding the deepest embedded knowledge of the system dynamics leading to deforestation in the landscape.

This is based on the fundamental assumption that landscape stakeholders hold valuable experience and knowledge about the practical working of the system leading to deforestation in the landscape, which is often only partially reflected in project documentation and theories of change. A thorough understanding of landscape-specific institutional practices is key to understand causality between interventions, their outcomes, and the sought impact – allowing development actors to craft more accurate Theories of Change and project implementation strategies. Hence, engaging representatives from the full spectrum of key stakeholders is necessary for the Project team to obtain a comprehensive understanding of system dynamics and their interplay with the sought impact pathways.

For the purpose of the assessment, landscape stakeholders are defined as those who influence deforestation in the landscape and/or those who are affected by it[24] (Figure 4). Annex 1 includes a template to collect and organize this information. If a stakeholder analysis does not already exist or should be updated, the following process provides practical guidance for the Project team to identify the key landscape stakeholders to be engaged in the assessment.

1. Identify the landscape stakeholders – key actors (groups and/or individuals, if relevant) in the landscape and key actors physically outside of the landscape who either influence deforestation in the landscape and/or are affected by it. This will likely include actors from government, non-governmental organizations, producers/farmers (individually or organized as a group), businesses (both those operating in the landscape and those purchasing from the landscape), indigenous groups, local communities and towns, academia, international organizations, and others. Naturally, this also includes other actors who are implementing interventions in the landscape aimed at decreasing deforestation.

2. Categorize landscape stakeholders across two characteristics:

   A   The level to which that stakeholder *influences* (i.e., changes or impacts) forests in the landscape:

   - High (H) – the actor significantly contributes to, motivates, and/or enables reforestation, forest preservation, and/or deforestation

   - Low (L) – the actor only somewhat contributes to, motivates, and/or enables reforestation, forest preservation, and/or deforestation

   B   The level to which that stakeholder is *affected (*or *is interested) by* deforestation in the landscape:

   - High (H) – the actor is significantly affected by deforestation in the landscape

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[24] For further guidance on stakeholder identification and analysis (e.g. to respond to questions such as *what to do with stakeholders who have high power but low interest?*), the Project team may want to consult Bryson, J.M., 2004. What to do when stakeholders matter: stakeholder identification and analysis techniques. *Public management review*, *6*(1), pp.21-53.

- Low (L) – the actor is only somewhat affected by deforestation in the landscape

Example

Stakeholder (Organization)	Stakeholder type	Level of stakeholder influence on forest in the landscape	Level the stakeholder is affected by efforts to reduce deforestation in the landscape
District Level			
Head (Bupati) of Pelalawan	Government	High	High
Chair (Ketua) District People's Representative Council	Government	High	High
Secretary (Sekda) of Pelalawan District	Government	High	High
District Office for Estate Crops and Livestocks (Disnakbun)	Government	High	High
District Development Planning Agency (Bappeda)	Government	High	High
District Environment Agency (BLH)	Government	High	High
District Disaster Management Authority (BPBD)	Government	High	Low
District Office for Cooperative, Trade and Market Service (Diskup)	Government	High	Low
District Agency for Investment and Integrated Services (DPMPTSP)	Government	High	Low
District Office for Land (Kankab ATR BPN)	Government	High	High
Pelalawan Technology Highschool (ST2P)	Academia	Low	Low
Amanah Association (Growers Association)	Productive sector	Low	High
PT. Asian Agri	Productive sector	Low	High
PT. Astra Agro Lestari	Productive sector	Low	High
PT. Wilmar	Productive sector	Low	High
PT. Musim Mas	Productive sector	High	High
PT. Adei Plantations Group	Productive sector	Low	High
PT. Sinar Haska Lestari	Productive sector	Low	High
PT. Surya Brata Sena Plantation	Productive sector	Low	High
PT. Peputra Supra Jaya	Productive sector	Low	High
WWF Indonesia	Non-governmental/civil society (NGO/CSOs)	Low	High
JIKALAHARI	Non-governmental/civil society (NGO/CSOs)	Low	High
WALHI	Non-governmental/civil society (NGO/CSOs)	Low	High
CORE (Daemeter & Proforest)	Non-governmental/civil society (NGO/CSOs)	Low	High
Earthworm Foundation	Non-governmental/civil society (NGO/CSOs)	Low	High
International Finance Corporation (IFC)	Finance sector	Low	Low
PT. Bank Riau Kepri	Finance sector	Low	Low
PT. Bank Rakyat Indonesia (BRI)	Finance sector	Low	Low
PT. Bank Nasional Indonesia (BNI)	Finance sector	Low	Low
PT. Bank Mandiri	Finance sector	Low	Low
Provincial Level			
Governor of Riau Province	Government	High	High
Secretary (Sekda) of Riau Province	Government	High	Low
Provincial Office for Food Crops, Horticulture and Plantation (DTPHP)	Government	High	High
Provincial Development Planning Agency (Bappeda)	Government	High	High
Provincial Office for Public Works and Spatial Planning (DisPUPR)	Government	High	High
Provincial Office for Environment and Forestry (DisLHK)	Government	High	High
University of Riau (UNRI)	Academia	Low	Low

NO	Stakeholder (Organization)	Stakeholder type (suggested categorization in drop-down, but please use what makes most sense for your context)	Level of stakeholder influence on forest in the landscape (ability to change/impact)	Level the stakeholder is affected by efforts to reduce deforestation in the landscape (impacted by)
1	Mano Oil Palm Industries	Productive Sector	HIGH	HIGH
2	Madina Rock Crusher	Productive Sector	LOW	LOW
3	MNG Mining	Productive Sector	HIGH	HIGH
4	Bea Mining	Productive Sector	HIGH	HIGH
5	Aureus Mining	Productive Sector	HIGH	HIGH
6	Charcoal Union	Productive Sector	HIGH	HIGH
7	Liberia Chain Saw Association	Productive Sector	HIGH	HIGH
8	Liberia Timber Association	Productive Sector	HIGH	HIGH
9	Conservation International	NGO	HIGH	LOW
10	IDH	NGO	HIGH	LOW
11	Solidaridad	NGO	HIGH	LOW
12	Royal Society for the Protection of Birds	NGO	HIGH	LOW
13	Society for the Conservation of Nature in Liberia	NGO	HIGH	LOW
14	Wild Chimpanzee Foundation	NGO	HIGH	LOW
15	Fauna and Flora International	NGO	HIGH	LOW
16	World Resources Institute	NGO	HIGH	LOW
17	Green Advocates	NGO	HIGH	HIGH
18	Sustainable Development Institute	CSO	HIGH	HIGH
19	Skills and Agriculture Development Services	CSO	HIGH	HIGH
20	Citizens Against Hunger	CSO	HIGH	HIGH
21	Project Affected Communities (17)	Local Communities	HIGH	HIGH
22	Senjeh Land Committee	Local Communities	HIGH	HIGH
23	Zodua Land Management Committee	Local Communities	HIGH	HIGH
24	North West Oil Palm Landscape Forum	Local Communities	HIGH	HIGH
25	University of Liberia Agriculture Dept	Academia	LOW	LOW
26	UNDP-GGP	Executing Partner	HIGH	LOW
27	World Bank	Donor	HIGH	LOW
28	EU	Donor	HIGH	LOW
29	USAID	Donor	HIGH	LOW
30	Forestry Development Agency	Government	HIGH	HIGH
31	Environmental Protection Agency	Government	HIGH	HIGH
32	Ministry of Agriculture	Government	HIGH	HIGH
33	Ministry of Mines and Energy	Government	HIGH	HIGH

Figure 3: Examples of identification of landscape stakeholders from scoping exercise conducted in the Pelalawan district in Indonesia, and the Northwestern Landscape of Liberia.

3. Identify key landscape stakeholders to be engaged in CALI – the influence-interest matrix shown in Figure 4 can help the Project team to decide the most adequate engagement strategy to be adopted with each actor, and also to identify the key stakeholders to be engaged in CALI. It is recommended that representatives of stakeholders pertaining to the three outer categories of the matrix (high influence/low interest; high influence/high interest; low influence/high interest) should be engaged in CALI.
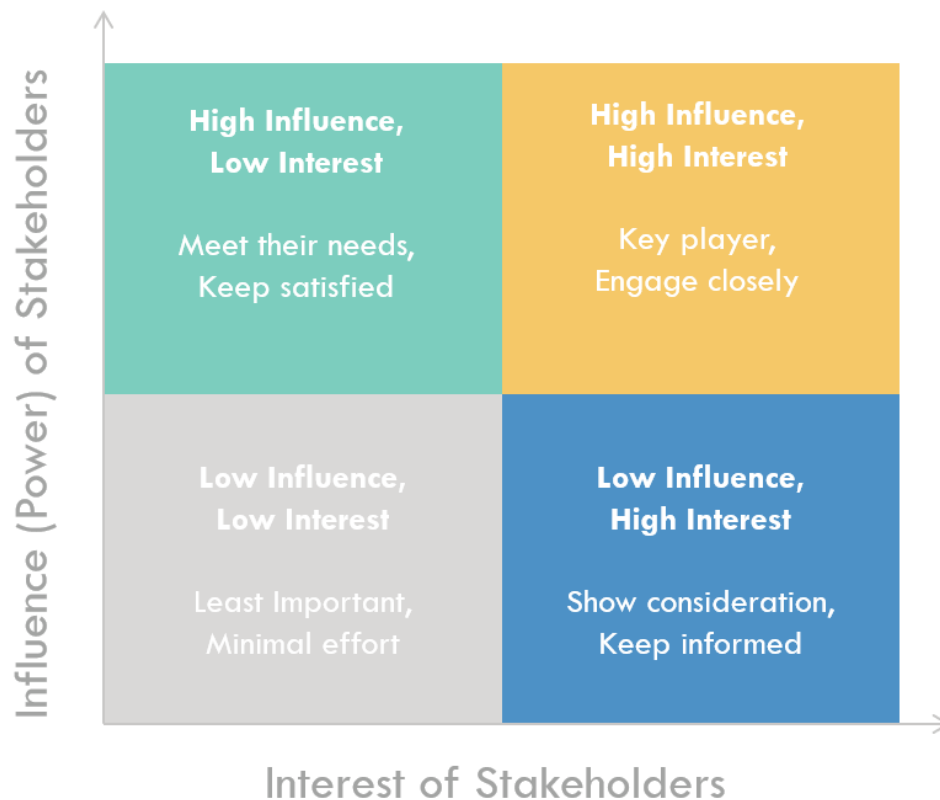
Figure 4: Influence/interest matrix for stakeholder analysis.

If not already covered by the above analysis, it is also recommended to engage representatives of all the actors with whom the Project engages more closely in implementation (including direct "beneficiaries" and implementing partners). Participants should always be representative of geographic differences (e.g., if the landscape covers three departments, participants should not all be from the same department) and include representation of women and young people (and any marginalized or vulnerable groups, depending on the context).

Individuals with broad and deep practical knowledge of the landscape and the Project are needed to produce an accurate stakeholder analysis. For each application of CALI, the stakeholder analysis should be reviewed and updated, as opposed to reproduced, and any changes in information or observed trends between applications should be documented.

While developing or updating the stakeholder analysis, the Project team may also find it useful to map the key behavioral drivers of different groups of stakeholders (or, for a finer analysis, of each individual stakeholder), including their:

- Ambitions;
- Needs;
- Constraints;
- Resources;

- (Inter-)dependencies.

Beyond helping with the categorization of the landscape stakeholders in terms of their influence and interest vis-à-vis deforestation in the landscape, the above exercise may provide important insights in preparation of the CALI workshops, while allowing the Project team to identify potential areas of tensions among stakeholders and discuss how to mitigate the risk of conflict surfacing (or degenerating) throughout the workshops[25] (see also Insight 2 below on power).

INSIGHT 2: Dealing with Power

Power imbalances are very likely to surface in all participatory research engaging stakeholders exhibiting differences in terms of control over resources, gender, age, language, etc. These imbalances should be acknowledged by the Project team before and during the workshops so that they can be managed to reduce biases and promote an equitable discussion. Some of the measures that can be taken to actively manage power imbalances include (but are not limited to):

- Ensuring equal representation across key landscape stakeholder groups;
- Intentionally designing the agenda with dedicated time to all groups;
- Intentionally dividing the groups in advance of the workshop, as opposed to letting individuals choose themselves;
- Having a plan in place to intervene if an actor is overstepping;
- Identifying supporters in the group to help the facilitator encourage quieter voices are heard;
- Distributing information in advance of the meetings to allow all participants to enter with the same background;
- Carefully considering how the date, time, and location of the workshop will affect attendance.

Important note: despite the effort of the Project team, it may not always be possible to engage (or ensure the meaningful participation of) representatives of all key Project stakeholders, due to conflicting agendas and/or sensitivities between actors, among the others. Therefore, the Project team may need to supplement the information collected through the main workshops with additional workshops, interviews and/or surveys. For example, if indigenous communities are underrepresented in the CALI workshops due to access or language issues, it is the responsibility of the Project team to ensure that their perspectives are captured through another mean. This may also be relevant in case of unbalanced participation among workshop participants, a situation which will require individualized follow-up with less vocal actors.

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[25] If well managed, conflict can be an extremely powerful way to advance dialogue and collaboration among stakeholders for desirable outcomes. Nevertheless, surfacing conflict can also disrupt relationships among stakeholders in a negative manner. The UNDP Green Commodities Programme's *Guide to Effective Collaboration* provides valuables tools and recommendation on how to productively and safely "work through conflict" in dialogue settings.

A holistic view of landscape interventions and their interdependencies

Purpose: (i) To identify what interventions were and are currently being implemented in the landscape by the Project to analyze and adjust their impact pathways and implementation strategies; (ii) to identify what interventions were and are currently being implemented in the landscape by other actors and understand their connections with Project interventions to identify synergies and co-dependencies.

The Project team should have a comprehensive overview of Project and other actors' interventions implemented in the landscape with the aim of reducing deforestation. Annex 2 provides a simple template to collect and organize this information, which will be reviewed during the analysis of the system map and the review of the Project impact pathways and adjustments to the ToC and Project implementation strategy.

INSIGHT 3: What is an intervention?

The distinction between an intervention and an activity can sometimes be unclear, and in many cases may vary somewhat between landscapes. The goal is to maintain consistent interpretation across the list of interventions for a specific landscape. For example:

- Establishment of a multi-stakeholder platform (with activities such as: catalogue current actors, identify roles, develop rules, design a communication strategy, and/or others);
- Capacity-building for Good Agricultural Practices (with activities such as: identify communities, develop training curriculum, hire facilitator/s, organize trainings, etc.);
- Promotion of adequate spatial planning at the relevant jurisdictional level (with activities such as: develop preparatory study, support regulation development, maintain relationship with relevant authority/ies and stakeholders, etc.);
- Development or support to the enforcement of a particular policy or regulation (with activities such as: hiring of patrols, capacity building, monitoring and oversight, etc.);
- Promotion of incentives for forest conservation such as REDD payments, PES, certifications (with activities such as: conduct awareness-raising session/s, development of incentive scheme, maintain relationship with relevant authority/ies and stakeholders, etc.).

The following process provides detailed guidelines for the Project team to properly log this information in support of the implementation of CALI.

1. **Identify interventions.** Considering the Project document and/or the workplan of the Project, and looking at other projects aimed at reducing deforestation in the target landscape, list all relevant interventions in the template provided (Annex 2).

2. **Understand the interventions**. Do some research and log relevant information for each intervention in the template including:

   A The project/organization leading implementation of activities. Also note whether the intervention is within the Project (if the Project is implementing an intervention in partnership with another organization, it should still be considered a Project intervention) or not.

B   A brief description of the intervention.

C   The status of implementation for each intervention

- 1 = Framework or plan exists, but activities are not actively being implemented

- 2 = Activities are partially/insufficiently being implemented

- 3 = Activities are actively mostly/fully being implemented

Example

Table 2: Example of intervention list from Situation Analysis conducted in Paraguay (Chaco).

Intervention	Implementing Organization (s) – indicate if one is a clear "lead"	Project intervention or non-Project intervention	Status of implementation (0-3)	Designed to address which driver (s)
A. Implementation of the platforms (soy + beef, Alto Paraná + Itapua)	UNDP	Project	2	Illegal activities; logging; agricultural expansion
B. Decentralization	Government with INFONA, MADES, SENFVC, UNDP	Project	1	Illegal activities; logging; agricultural expansion; invasion of private lands
C. Harmonization of environmental and forestry laws into one common legal framework	Government with UNDP	Project	2	Illegal activities; logging; agricultural expansion; invasion of private lands
D. Agricultural good practices (including conservation of roads/paths and forest)	The platform with UNDP	Project	3	Illegal activities; logging; agricultural expansion;

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3.   **Reflect on interdependencies between interventions.** After having listed all relevant Project and non-Project interventions, the Project team should reflect on how implementation of Project and non-

Project interventions may influence each other. Engaging in this exercise in preparation of CALI may be helpful for the Project team to do a preliminary scoping of potential opportunities for collaboration within the landscape. The exercise outlined in Appendix A proposes a visual process to support this reflection.

An adequate Project monitoring framework and system

Purpose: For the Project to be able to keep track of the outputs achieved, and the extent to which the expected outcomes are materializing. If well developed, this also allows to test the critical assumptions underpinning the Theory of Change of the Project. This information will be critical to support the Review of the Project impact pathways and subsequent adjustments to the Project ToC and implementation strategy.

It goes without saying that engaging in a CALI assessment would be useless, if the Project does not (plan to) have adequate information on its progress-to-date in achieving the expected outputs, and some indication on whether the expected outcomes are materializing. The focus and added value of CALI application is on unpacking causality, rather than measuring progress.

An adequate monitoring framework and system for a project or programme aiming to reduce deforestation in a target landscape should include, as a very minimum, a plan with quantitative indicators to monitor progress towards the expected outputs, and quantitative and qualitative indicators to monitor the realization of the expected outcomes (aligned with the Theory of Change) and ultimate impact – meaning changes in forest cover and deforestation rates in the landscape (see Appendix B and C). The information and evidence collected through the Project monitoring system will be critical to support the assessment, and especially the validation and revision of the Project impact pathways.

A good monitoring system would also allow for continuous monitoring of assumptions, and potentially include outcome harvesting exercises to identify emerging (or unexpected) outcomes, which would otherwise often fall through the cracks, especially in the case of interventions in complex systems.

Although it is outside the scope of this Guidebook to provide detailed guidance on how to develop an adequate project monitoring framework and system, it is important to note that we expect the Project framework and system to evolve as a result of each application of CALI, in alignment with adjustments to the ToC and Project implementation strategy.

Adequate resources for application

Purpose: To ensure that the Project has the necessary monetary, staffing and time resources for an adequate implementation of CALI.

In terms of financial resources, it is not easy to state exactly how much CALI will cost due to the substantially varying size of projects aimed at reducing deforestation in target landscapes – as a wider or narrower scope of the Project may also affect the scope of the assessment – and the varying cost of facilitators and workshop

venues and materials in different locations. Nevertheless, based on previous experiences, the Project should expect to invest about USD 10-20,000 for each application of CALI (at project start, during implementation, and eventually after project end).

In terms of staffing, the Project team should ensure that all roles and responsibilities are covered as per Appendix D (including external support to be contracted) and otherwise plan to hire additional external support.

In terms of time, the Project team needs to ensure that staff engaged in the implementation of CALI can allocate the necessary time to this exercise, including for planning, developing supporting products, and participating in the different workshops and activities. Beyond the CALI Project team, it is also important to ensure that landscape stakeholders can participate in the exercises needed for a successful implementation of CALI. This includes participation in 2-4 days workshops for each application of CALI (at project start, during implementation, and eventually after project end).

Other desirable preconditions

The following two conditions may further facilitate a smooth application of CALI; however, they should not be intended as strict prerequisites, but rather as additional desirable preconditions:

- An existing dialogue between the representatives of key landscape stakeholders, through which (at least some of the) parties are already connected and information is shared – we expect more advanced and insightful discussions between stakeholder representatives who are already connected with each other and potentially know that they can trust each other.
- Reliable studies on the landscape and its dynamics leading to deforestation are available, to guide analysis and preparations for CALI – especially for the system mapping phase. This information would allow the system map to be grounded in research, which can be used to triangulate the experiences shared by the representatives of key landscape stakeholders (providing an additional guarantee for validity).

FIRST APPLICATION OF CALI – AT PROJECT START

Overall purpose: to refine the Project team's understanding of the system leading to deforestation in the target landscape, and, in this light, encourage a review and first adjustment of the Theory of Change, strategy and results framework of the Project.

Method: facilitated workshop/s engaging the Project team and representatives of key Project stakeholders.

Resulting products: a new or updated map of the system leading to deforestation in the target landscape; a new or revised Theory of Change and results framework for the Project.

Suggested length for in-person workshop: 2 full days.

The first application of CALI is recommended at Project start – or in any case within the first year of implementation – once at least the critical roles of the Project implementation team are covered.

Through this first application, CALI will support the Project implementation team to refine their understanding of the system in which they are intervening (i.e. the system leading to deforestation in the target landscape), while deepening their relationships with and understanding of key Project stakeholders (and the key behavioural drivers of the system leading to deforestation).

This will allow the Project implementation team to develop a more systemic, complexity-aware understanding of the Theory of Change of the Project, its strategy and interventions aimed at addressing the drivers of deforestation, while providing for a very first occasion for the Project implementation team to validate and refine the ToC and its assumptions, and, by consequence, the Project interventions and results framework.

EXPERIENTIAL LEARNING

Beyond its key purpose of refining the ToC and implementation strategy of the Project, the first application of CALI provides a learning opportunity for the Project implementation team and representatives of key stakeholders, who are engaged in a deep reflection on:

- The system leading to deforestation in the Project landscape – in which they are embedded – and the relative (and inter-dependent) role of each stakeholder (or stakeholder group);
- The Theory of Change of the Project and its implementation strategy, and the critical assumptions (which may or may not be validated) on which rely its chances of success.

Through engaging in this discussion, the Project implementation team and stakeholders are given a chance to deepen their understanding of the system in which they are embedded (and/or that they are trying to change), discussing it from a holistic rather than siloed perspective.

Preparation

<u>Ensure all prerequisites are met</u> – The Project team should ensure that all prerequisites are met (or can easily be met) before considering the application of CALI at any stage of project implementation. If, at project start,

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the monitoring framework and system are not yet in place, the first application of CALI and its resulting adjustments to the Project's ToC and results framework provide for an optimal time for the Project to build their monitoring framework and system.

Nominate a "CALI project team" – Appendix D details the critical roles and responsibilities to be covered in the CALI project team. Most responsibilities are expected to be absorbed by the Project team members (and some of them can cover for different roles), although external facilitation support is essential for a smooth and unbiased implementation of CALI[26].

Develop a CALI implementation workplan – the CALI project manager (CALI PM) should develop a CALI implementation workplan following the steps explained in the guidebook. A reference template is provided as Annex 6.

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[26] To this end, it is critical to plan in time for the contracting of external support, especially in large and bureaucratic organizations where contracting processes are often lengthy.

1.1. Develop a landscape system map

Purpose: *To deepen the understanding of the Project team of the complex system dynamics leading to deforestation in the target landscape.*

Method: *Facilitated workshop engaging the Project team and key Project stakeholders.*

Resulting Product: *a new or updated map of the system leading to deforestation in the target landscape.*

Suggested Length for in-person workshop: *1 full day.*

Many threats facing the world's forests are influenced by a complex system of dynamics and considering just one part of this system does not support effectively and efficiently changing the paradigm. The System Mapping exercise allows the Project team to situate and expand their Theory of Change, through capturing other important factors influencing forest cover and define some of the contributing factors causing or enabling the drivers to occur. In this exercise, it is very important that the group of participants strive to consider elements from all three sustainability axes: socio-political, economic, environmental – building on the landscape assessments prepared during project design and any project baseline studies as well as national- or local-level studies of relevance.

> INSIGHT 4: System Map
>
> A System Map is one of the most important and powerful tools of System Practice. A System Map (also known as *Causal Loop Diagram*) structures and visualizes the elements of a system to capture causal connections and reveal **feedback loops**. Feedback loops are closed chains of causal influence and are the structural explanation for emerging development. The dynamics of these loops can be **reinforcing** (virtuous loops and vicious cycles) or **balancing** (stabilizing and stagnating loops). These feedback loops are often part of our thinking, but we barely make them explicit and consider the interactions between different loops. **The interplay of feedback loops is what drives a system and determines its long-term developments.**
>
> The System Map therefore helps us to conceptualize how system structure leads to system behavior. A System Map makes our implicit perspectives and assumptions more explicit, visualizes the interdependencies between all factors and supports the development of a shared understanding among stakeholders. Figure 6 shows an exemplary System Map for a fictional landscape where soy production and bushfires are driving deforestation. The map shows the different factors, their causal connections and feedback loops.
>
> *Figure 6: Exemplary system map: deforestation driven by soy production and bushfire.*
>
> As the System Map provides a narrative of how the interplay of elements leads to system behavior, it supports identifying areas for improvement ("*leverage points*") and hypothesizing the impact of interventions on the overall system (see step 1.2). The System Map does not aim to be a perfect representation of the actual processes and is - just as any other model - a simplification of our complex reality. The map should be seen as a knowledge repository that helps us to capture our current understanding and that evolves together with our learning as new information may reveal itself.

If a map of the system leading to deforestation in the target landscape is already existing, the CALI project team should reflect on how it was developed: were representatives of key stakeholders engaged? To what extent, or was anyone missing? Depending on the answers to these questions, the rest of this exercise could be limited to a validation and update of the existing system map.

Else, to adequately understand and assess the system dynamics leading to deforestation in the project landscape, the CALI Project team should utilize all existing information (project document, studies and analyses, local knowledge from the key stakeholders) to develop a landscape system map showcasing the drivers and contributing factors of deforestation in the Project target landscape. The detailed steps to develop a system map focused on deforestation in a certain landscape or jurisdiction are presented in Appendix E. Alternative approaches to developing a landscape system map can also be followed, as long as they live up to the basic principles outlined in this section.

INSIGHT 5: Direct and Indirect Drivers of Deforestation

It is important to distinguish between *direct* and *indirect* drivers of deforestation. **Direct drivers** are the processes or human activities that directly cause deforestation in the landscape. **Indirect drivers** are the complex interactions of social, economic, political, cultural and technological processes that bring about direct drivers. Table 1 below shows examples of direct and indirect drivers of deforestation[27].

Table 2: Non-exhaustive examples of direct and indirect drivers of deforestation.

Direct Drivers	Indirect Drivers (examples)[28]
- Commercial agriculture - Subsistence agriculture - Surface mining - Infrastructure development - Urban expansion	**At the international level:** - Market behaviour (supply and demand) - Fluctuation in commodity prices - Fluctuation in currency exchange rates - Financial flows (investments that do or do not take into account deforestation as a financial risk) **At the national level:** - Population growth, - Behaviour of domestic markets (particularly for agricultural goods), - National policies that favour non-forest land uses - Poor governance - Fiscal incentives and subsidies (e.g., government subsidies for production of certain agricultural crops) - Land market **At the local level:**

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[27] UNEP, 2018. REDD+ Academy Learning Journal: Drivers of deforestation and forest degradation.
[28] Many REDD+ readiness plans identify weak governance and institutions, poor cross-sectoral coordination, weak law enforcement and poverty as critical indirect drivers.

	• Poverty • Food insecurity • Changes in household behaviour

Representatives of key Project stakeholders (those with at least high interest or high influence as per the stakeholder analysis) [29] – should be invited to participate in this exercise so they can contribute with their situated knowledge of system dynamics. Adopting a participatory approach also ensures that representatives of key landscape stakeholders develop a common understanding of the drivers and dynamics in the system leading to deforestation in the Project landscape.

Nevertheless, this step can also be performed solely by the CALI Project team, who should at least consider validating the resulting product through engaging key stakeholders individually or in groups.

EXPERIENTIAL LEARNING

Beyond allowing the Project team to gain a deeper understanding of the system dynamics leading to deforestation in the target landscape, this exercise allows representatives of key Project stakeholders to develop a clearer and, in some cases, *common* understanding of the system in which they are all embedded, thus promoting the breaking of silos, and engagement in a dialogue and joint sensemaking process around the structural and behavioural drivers of negative environmental outcomes.

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[29] The *Stakeholder Engagement* learning journal developed within the framework of the REDD+ Academy may provide useful insights to project teams in preparation for this and subsequent exercises. It can be accessed through this link.

1.2. Identify Project impact areas in system map

Purpose: *To connect the Theory of Change and planned interventions of the Project to the system driving deforestation in the landscape, so to refine the Project team's understanding of the systemic impact sought to be achieved through the Project, and identify any critical gaps or areas of improvement.*

Method: Facilitated workshop engaging the Project team and key Project stakeholders.

Resulting Product: Landscape system map with visual identification of Project impact areas, potential gaps and initial observations/questions on the chances of effectiveness of the Project implementation strategy.

Suggested Length for in-person workshop: half a day.

Too often Project teams are focused on their workplan and deliverables without putting them all in the landscape context and clarifying the planned causality of their actions. This step sets the foundation for this understanding and the basis on which to assess whether their activities are more or less likely to contribute to delivering the intended results. This builds on the Theory of Change prepared during the design phase which the Project team now needs to review and update, based on current realities and driving forces in the landscape.

1. Connect the system map to Project (and optionally non-Project) interventions

Starting from the landscape system map, the Project team and representatives of key stakeholders should identify, without looking at the Theory of Change of the Project, the expected impact areas in the system driving deforestation in the landscape. This gives a chance to the Project team to present the Theory of Change and implementation strategy of the Project further to the key stakeholders engaged in the workshop. Drawing on the system map (or a copy of it), the Project team should mark the broad system areas impacted by each of the Project interventions (for a definition of "intervention", please refer to Insight 3 on p. 16); an example is shown in the next page (Figure 6). At this stage, the Theory of Change of the Project can be consulted to refine the analysis.

It is important to note that an intervention may be linked to multiple factors in the system map, if they are all addressed considerably. The CALI project team, in consultation with the relevant implementing partner/actor if needed, should also identify all intermediate outcomes for each intervention, and, while going through this process, consider updating the landscape system map, as needed.

The same can also be done for non-Project interventions (including policies), and the CALI Project team should use the list of landscape interventions to log the direct and indirect driver(s) of deforestation that each intervention is designed to address; this will help to identify any gaps in the broader set of interventions implemented in the landscape. At this stage, the CALI Project team may also want to review the interdependencies between Project and non-Project interventions, in light of the above analysis (Appendix A).

While going through this exercise, the Project team should maintain engagement with the representatives of key landscape and Project stakeholders, through working in smaller groups, or opening "the floor" at any time for questions or comments. These should all be logged, together with comments from the Project team members themselves, for example using sticky notes, which can be juxtaposed to the relevant Project impact area (or gap area).

Figure 5: Landscape system map with identification of Project impact areas.

2. Initiate the analysis of interrelationships between Project (and optionally non-Project) interventions and the system driving deforestation in the landscape

Looking at the resulting product, the facilitator should engage the Project team members and representatives of key stakeholders in an open conversation addressing the following questions (and more can be added if needed):

- Are Project (and/or non-Project) interventions addressing the key *leverage points* in the system? How?

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INSIGHT 6: Analyzing Leverage Points

In systems practice, a leverage point is a place in a system where a small change could have a large, beneficial impact on the overall system. Leverage points can be found on various levels within a system. In the map, good leverage points are where you are able to influence a part (feasibility) and this could have a large impact on the whole (impact).

Start by assessing the ***impact*** of a leverage point, through looking at the system map and imagining a change of the leverage point to occur. What would be the effects on the system? How would the main variable change? Would the change have a long-term, beneficial effect on the system and the main variable?

Then move to assess ***feasibility***, i.e. the potential of the Project to actually influence the leverage point. Do you have the required resources? Which actors do you know that might have an influence?

Impact and feasibility of different leverage points in the map can be rated and visualized in a graph such as the one shown in Figure 7 below.
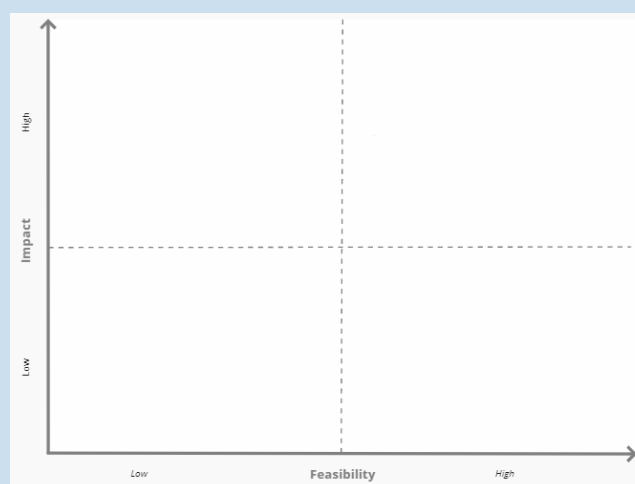
Figure 6: Assessing and visualizing leverage - chart by the Systemic Design Group.

(Credits to the Systemic Design Group and their System Mapping Toolkit for the above reference and figure).

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- Are there any other critical gap areas which may compromise the ability of the Project to achieve its goal of reducing deforestation in the target landscape?
- If so, can leverage points and/or other gap areas be addressed by the Project, given its resources and scope? Which other organization or institution should/could be addressing these critical gap areas?

Here the Project team and stakeholders should review the list of landscape interventions (and policies), and eventually try to connect these as well to the landscape system map (if not yet done).

- Could working in *partnership* with other organizations or institutions targeting the same or complementary system areas provide an added value for the ability of the Project to achieve its goal of reducing deforestation?
- Looking at the resulting product, are there any broad comments or questions from the audience (on interventions, impact areas, gaps)? Here the facilitator should open the floor and moderate a discussion, while logging inputs with sticky notes to be applied on the map.

The input gathered during this exercise will prepare and feed a deeper conversation on causality to be held in the next exercise.

EXPERIENTIAL LEARNING

Through this exercise, the Project team and key stakeholders are expected to gain a holistic view of how Project (and optionally non-Project interventions, including policies) are expected to affect the complex system dynamics leading to deforestation in the target landscape.

It will also provide insights to the participants less familiar with the *modus operandi* of development organizations, including on *Theories of Change* and implementation strategies.

1.3. Review Project impact pathways

Purpose: *To refine the Project impact pathways and implementation strategy, considering their interaction with the complex system dynamics leading to deforestation in the target landscape, through leveraging the situated knowledge of key stakeholders.*

Method: Facilitated workshop engaging the Project team and key Project stakeholders.

Resulting Product: New or adjusted impact pathways and implementation strategy for each Project intervention.

Suggested Length for in-person workshop: half a day.

Starting from the landscape system map with Project (and non-Project) interventions' impact areas, and the broader comments and questions of participants, the facilitator should now divide participants into smaller working groups, one for each Project intervention + eventually an additional group exploring gap areas (including key leverage points, in the case these can be addressed by the Project itself). Each intervention-based working group should be led by the most relevant Project team member, possibly the focal point for implementation of the intervention, and alternatively another team member highly involved.

Key stakeholder representatives should be asked to join the working group to which they relate the most – looking at the target impact areas in the map for each intervention. If a participant feels drawn by multiple working groups (as interventions will likely have touching points of impact in the system map), s/he should join the one where s/he thinks to be able to contribute the most (depending on the broad nature of the intervention).

In each working group, the intervention's ***impact pathway*** (see Insight 7) should be first presented by the Project team member, and then discussed with the working group, drawing on the following questions (more can be added, as needed):

- What are the first reactions from the working group after being presented with the intervention's expected impact pathway?
- Looking at the system map, which contributing factors/enabling conditions (see Appendix F) may affect the realization of the intermediate outcomes (with a supporting, hindering, or amplifying role)? Here the group should also consider what are possible effects of feedback loops on the intervention's impact pathway. The identified contributing factors should be added alongside the intervention's impact pathway (aim is to move from a linear to a complex impact pathway).
- What are the key assumptions underpinning the realization of the impact pathway, and what does the working group think about them? Are they reasonable assumptions or should they be refined? Here the list of assumptions (if already existing) should be updated, or developed based on the working group's discussion.
- Looking at the broader system map, are there any other wider system effect that might be caused by the Project intervention? If so, add them to the impact pathway.

The working group focusing on Project gaps should reflect on whether additional interventions are needed to bring about the desired impact, focusing firstly on developing their impact pathway and then crafting a proposed implementation strategy (see process below). The latter can then either be covered by the Project or

proposed for additional funding. The exercise can also take the form of considering adjustments to existing interventions to ensure that any additional outcomes (from the gap area/s) can be achieved.

Important note: If an impact pathway does not exist (for example in the case of a Project where a Theory of Change was not elaborated, or not thoroughly), the working group should focus on developing (rather than questioning and adjusting) the impact pathway. The above list of questions can then help guide the discussion for final validation.

INSIGHT 7: Impact Pathways and implementation strategy

An **impact pathway** connects one or more project intervention/s to one or more driver/s of deforestation through a linear (Figure 8) or complex (Figure 9) causal pathway, including intermediate outcomes (contributing factors).
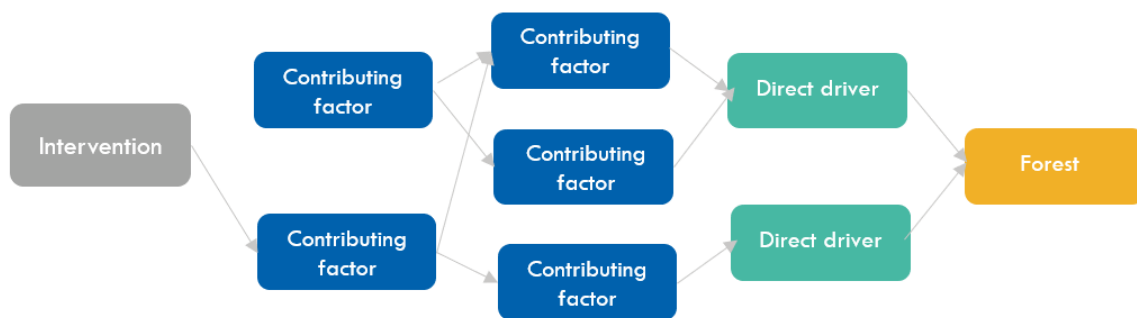

Figure 7: Visualization of a linear impact pathway.

Figure 9: Visualization of a complex impact pathway.

[eventually add examples from CALI application in Peru]

The **implementation strategy** of an intervention consists of the suite of activities aimed at bringing about the expected outputs, which in turn would ignite changes across the relevant impact pathway.

After having discussed and adjusted the intervention's impact pathway/s, the working group should move to the intervention ***implementation strategy***, which should be first presented by the Project team member, and then discussed with the working group, drawing on the following questions (more can be added, as needed):

- Looking at the intervention's impact pathway/s, is the existing implementation strategy likely to bring about the expected intermediate outcomes, and thus affect the system impact area as expected? If not, what other outcomes or contributing factor/s of the impact pathway/s should be addressed? And how?
- Are feedback loops adequately considered in the Project implementation strategy? If not, how should they be addressed?
- Based on the previous discussions, should any elements of the assumptions be targeted through (additional) specific actions as part of the Project (or non-Project) intervention/s? Which and how? Will the other assumptions be adequately monitored?
- Looking inward, what are critical outputs to be delivered to achieve the intermediate outcomes[30]? What are critical inputs (see Appendix F), and enabling conditions, including implementation of other interventions (including policies, see Appendix A)? What partnerships should be sought?

The above questions should help the working group to propose adjustments to the current implementation strategy. These should be logged by the Project team member leading the discussion, and will be used in the following step.

Important note: If an implementation strategy does not exist yet, the working group should focus on developing (rather than questioning and adjusting) the intervention's implementation strategy. The above list of questions can then help guide the discussion for final validation.

EXPERIENTIAL LEARNING

Through this exercise, the Project team and key stakeholders will gain a deeper understanding of the Theory of Change of the Project, and its implementation strategy, situating them in their complex landscape context.

More in general, the Project team and key stakeholders will also gain a deeper understanding of Theories of Change and the concept of causality, and its relevance for designing effective interventions.

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[30] Note that these could also include, among the other, a proper development of social and environmental safeguards, stakeholder engagement, and resource mobilization efforts.

1.4. Adjust the Project ToC, strategy and results framework

Purpose: To adjust the Theory of Change, implementation strategy and results framework of the Project, leveraging the information gathered through the previous step.

Method: *Facilitated workshop engaging the Project team and, optionally, key Project stakeholders.*

Resulting Product: *New or adjusted Theory of Change, project implementation strategy and results framework.*

Suggested Length for in-person workshop: *half a day.*

At this stage, the CALI Project team could decide to continue with or without the representatives of key project stakeholders. If the latter, it is recommended that a briefing note is developed and shared with them to inform them on how the inputs collected during the previous steps informed an adjustment of the Theory of Change of the Project, and its strategy and results framework.

The following exercises were thought for in-person workshops to be delivered with the support of prints, drawing boards, sticky notes and other relevant tools at the discretion of the workshop organizers and facilitator. Nevertheless, it should be explicitly mentioned in the ToR of the CALI PM, external facilitator or other relevant CALI project team member, that all three resulting products should be converted to a digital version.

1.4.1. Adjusting the Theory of Change of the Project

Looking at the revised impact pathways and assumptions resulting from the working group discussions in the previous step, the CALI project team (with or without the representatives of key stakeholders) should now engage in a final review, sensemaking and upgrade of the overall Theory of Change of the Project.

Indeed, the Project impact pathways revised in the separate working groups, would in most cases have numerous touching points, and without engaging in this final step, the CALI project team would likely be missing the opportunity to do a final refinement of the ToC through looking at synergies, which will subsequently inform the identification of opportunities to boost the Project implementation strategy.

First, the CALI PM (or other designated member of the CALI project team) should develop a draft of an upgraded ToC through merging the different impact pathways, underlying assumptions, and logging any questions emerging through this process. Then, the CALI PM (or other designated member of the CALI Project team) should lead a discussion with the workshop participants, aimed at delivering a final, upgraded, and validated version of the Project ToC. The following questions should help to drive the discussion:

- Are there any immediate questions emerging through looking at the draft ToC?
- Looking again at the landscape system map, does the team feel confident that the upgraded ToC adequately describes the dynamics of change processes in the identified system impact areas? Are there any key factors missing? Any additional assumptions that should be logged?
- Are feedback loops adequately accounted for in the upgraded ToC?

The facilitated discussion is expected to result in final refinements to the upgraded ToC, which should then undergo a final validation round.

<div style="border:1px solid black; padding:10px;">
<mark>EXAMPLE: Original vs. Upgraded Theory of Change (Peru)</mark>
</div>

1.4.2. Adjusting the Project implementation strategy

Once agreed on a final ToC, the Project team should engage in a Project-level discussion about the proposed adjustments to the Project implementation strategy. First thing first, the team members leading the working group discussions under 1.3. should be presenting the proposed adjustments to their implementation strategy, and why these would increase the likelihood of delivering an effective intervention. Then, they should be taking questions and feedback from the Project manager and other colleagues; this is expected to inform final adjustments to the implementation strategy of each intervention.

This exercise is expected to be conducted iteratively with the following one on Results.

The following questions should help guiding the discussion:

- Adopting both an intervention and Project perspective, which activities (or suites of activities) should be modified or extended?
- Which activities or additional interventions should be added? Which activities (if any) should be discontinued?
- Are any partnerships with other actors or Project stakeholders critical for the Project to be successful in its endeavor of reducing deforestation?
- How can the project leverage additional funds to cover critical activities/interventions that need to be added? Or work in partnership with other organizations?

The facilitated discussion is expected to result in final refinements of the Project interventions and expected Results.

<div style="border:1px solid black; padding:10px;">

<mark>EXAMPLE: Original vs. Upgraded Project implementation strategy (Peru)</mark>

</div>

1.4.3. Adjusting the results and logical framework of the Project

This exercise is expected to be conducted in an iterative way with the 1.4.2., as brainstorming about results will help the project team reflect more deeply on their implementation strategy.

Workshop participants should identify and phrase together the expected Results to be achieved by the Project (in case these are to be updated) and otherwise validate that the original expected Results are still valid.

<div style="border:1px solid black; padding:10px;">

<mark>EXAMPLE: Original vs. Upgraded Results or Logical framework (Peru)</mark>

</div>

From here, the Project team should move on to update their logical framework, through adjusting the key outcome, output and process indicators to be monitored during implementation. These can obviously consist of both quantitative and qualitative indicators, and should be done following general guidance on developing

quality indicators. If budget allows, it is always recommended that additional methods such as outcome harvesting are adequately planned for to also capture emerging (unplanned) outcomes, so to inform further adjustments of the Project's ToC.

EXPERIENTIAL LEARNING

This exercise will provide the Project team with a *thorough, common* understanding of the Project objectives, implementation strategy and expected results. The Project team will also strengthen their understanding of how a Theory of Change and implementation strategy relate to each other, and the overall context in which the Project is operating.

SECOND AND FURTHER APPLICATIONS OF CALI – DURING IMPLEMENTATION

Overall purpose: to reflect learnings from implementation in an adjustment of the Theory of Change, strategy, and results framework of the Project.

Method: facilitated workshop/s engaging the Project team and representatives of key Project stakeholders.

Resulting products: an updated map of the system leading to deforestation in the target landscape; an upgraded Theory of Change and results framework for the Project.

Suggested Length for in-person workshop: 2 full days.

Compared to the first application of CALI at Project start, at this stage more emphasis will be given on investigating *whether* and *how* Project interventions have already contributed – or not – to reducing deforestation and its key drivers in a specific landscape or jurisdiction, alongside other factors and interventions. Enabling and hindering factors will be explored with the key system actors, the Project stakeholders, who will be engaged in reflection with the Project team to increase the potential for success of the Project. Their embedded knowledge of system dynamics, together with the learnings of the Project team after some time of implementation, will provide critical elements for a refinement of the Theory of Change of the Project, and, by consequence, of its implementation strategy and results framework.

"When operating in conditions characterized by radical uncertainty, there is between Problem and Solution a space, an in-between of generative enquiries, of discovery and intelligence, from which robust arguments can emerge for new intents and renewed commitments of resources. This is a space of hypotheses, of mental metamodels that give us access to a system so as to discover from within it how to engage with it and how to "make happen" to it" – CHÔRA Foundation

The CALI project team will review the landscape system map (complementing it as needed) and Project impact areas, and engage in a causality assessment to refine the Theory of Change, implementation strategy and results framework of the Project.

Depending on the status of implementation of the different Project interventions, and the availability of information on the achievement of intermediate outcomes, the CALI Project team may decide to focus the assessment on Project contributions or *expected* contributions.

Depending on the duration of the Project, complexity of the context and related levels of uncertainty, CALI can be applied a varying number of times during Project implementation. In general, for projects lasting less than 5 years, we recommend to schedule the 2nd application of CALI around mid-term (as an input, complement, or substitute to a midterm evaluation); for projects lasting more than 5 years, further applications are recommended to continue to inform adaptive management; in this case, the results developed in the second application should obviously constitute the starting point for the assessment.

EXPERIENTIAL LEARNING

Through the second (and further) application(s) of CALI during Project implementation, the Project implementation team and key landscape stakeholders will have a chance to engage in a deep reflection on the interrelationship between the implementation of Project interventions and the system dynamics driving deforestation in the landscape. At this stage, the Project implementation team will have developed a thorough understanding of the context, with its challenges and opportunities, and thus be able to connect more deeply with landscape stakeholders (compared to Project start). Through discussion, the Project implementation team and key landscape stakeholders will have a chance to further deepen their understanding of the system in which they are embedded, while examining the Theory of Change of the Project and its chances of success.

Preparation

<u>**Ensure all prerequisites are met**</u> – As previously mentioned, the Project team should ensure that all prerequisites are met (or can easily be met) before considering the application of CALI at any stage of project implementation. At this stage, the monitoring framework and system should be well in place and generating evidence of progress against the expected results (at all levels, i.e., outputs, outcomes, and impact).

<u>**Nominate a "CALI project team"**</u> – To the extent possible, this should be the same team who drove the first (or previous) application of CALI. It is recommended that roles are assigned to a different team member only in the case of staff turnover. Again, the critical roles and responsibilities to be covered in the CALI project team are outlined in <mark>Appendix D</mark>. As for the first application of CALI, most responsibilities are expected to be absorbed by the Project team members (and some of them can cover for different roles), although external facilitation support is essential for a smooth and unbiased implementation[31].

<u>**Develop a CALI implementation workplan**</u> – the CALI project manager (CALI PM) should develop a CALI implementation workplan following the steps explained in the guidebook. A reference template is provided as <mark>Annex 6</mark>.

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[31] To this end, it is critical to plan in time for the contracting of external support, especially in large and bureaucratic organizations where contracting processes are often lengthy.

2.1. Review the landscape system map

Purpose: To update the landscape system map to reflect any changes in the complex system dynamics leading to deforestation in the target landscape.

Method: Facilitated workshop engaging the Project team and key Project stakeholders.

Resulting Product: an updated map of the system leading to deforestation in the target landscape.

Suggested Length for in-person workshop: half a day (including 1-2 hours for 2.2.).

As a first step of the 2nd application of CALI throughout Project implementation, the CALI project team should convene the Project team and key Project stakeholders in a workshop setting, to review and update the landscape system map developed at Project start.

This exercise should possibly be facilitated by the same professional who facilitated the first development of the system map. Should that not be possible, the CALI project team should identify the most suitable team member – or external consultant – to cover for this role. The resulting product could then be shared with the original facilitator for feedback and validation.

Starting from the original system map, the group should identify any changes in drivers and contributing factors leading to deforestation in the landscape, and reflect them accordingly in the system map, with the due consideration to their role in feedback loops. If any new relevant studies have been conducted and published during the timeframe separating the first and second application of CALI, for example as part of national REDD+ processes, these should be reviewed to adjust and/or complement the information reflected in the system map as appropriate.

This step is expected to result in some critical changes to the system map, as the Project team and key stakeholders will have also deepened their understanding of the system after few years of engaging (and experimenting) with it from within.

The updated system map will then constitute the starting point for the following exercises.

EXPERIENTIAL LEARNING

Through this exercise, the Project team and key Project stakeholders will continue deepening their analytical understanding of the system leading to deforestation in the target landscape, while building a shared understanding of the underlying problems and the main obstacles and opportunities for transformation.

2.2. Review Project impact areas in system map

Purpose: To update the connection of the Theory of Change and planned interventions of the Project with the system driving deforestation in the landscape, so to further refine the Project team's understanding of the systemic impact sought to be achieved through the Project, and identify any critical gaps or areas of improvement.

Method: *Facilitated workshop engaging the Project team and key Project stakeholders.*

Resulting Product: *An updated version of the landscape system map with visual identification of Project impact areas, potential gaps, and initial observations/questions on the chances of effectiveness of the Project implementation strategy.*

Suggested Length for in-person workshop: *1-2 hours during update of the landscape system map.*

After having updated the landscape system map, the Project team and key Project stakeholders should invest some time in re-contextualizing the Project interventions, starting from the work done at Project start. This is expected to result in further insights about the way/s through which the Project interventions interact with complex system dynamics and generate intelligence which will inform the subsequent steps.

As per the exercise 1.2., the Project team members should be drawing on the system map (or a copy of it), the broad system areas impacted by each of the Project interventions (for a definition of "intervention", please refer to Insight 3 on p. 16; for an example of the resulting product please refer to Figure 6 on page XX). The same can also be done for non-Project interventions (including policies), and the CALI Project team should use the list of landscape interventions to log the direct and indirect driver(s) of deforestation that each intervention is designed to address; this will help to identify any gaps in the broader set of interventions implemented in the landscape. At this stage, the CALI Project team may also want to review the interdependencies between Project and non-Project interventions, in light of the above analysis (Appendix A).

Then, a discussion with stakeholders should follow, and any relevant comments, questions or criticism should be logged and used as relevant inputs for the following exercise. This can be done, for example, through sticky notes, which can be applied to the relevant Project impact area.

The following questions can help guiding the conversation:

- Are Project (and/or non-Project) interventions addressing the key *leverage points* in the system? How? (Please refer to Insight 6 on p. XX to guide a review of the identified leverage points)
- Are there any other critical gap areas which may compromise the ability of the Project to achieve its goal of reducing deforestation in the target landscape?
- If so, can leverage points and/or other gap areas be addressed by the Project, given its resources and scope? Which other organization or institution should/could be addressing these critical gap areas? Here the Project team and stakeholders should review the list of landscape interventions (and policies), and eventually try to connect these as well to the landscape system map (if not yet done).
- Could working in *partnership* with other organizations or institutions targeting the same or complementary system areas provide an added value for the ability of the Project to achieve its goal of reducing deforestation?

- Looking at the resulting product, are there any broad comments or questions from the audience (on interventions, impact areas, gaps)? Here the facilitator should open the floor and moderate a discussion, while logging inputs with sticky notes to be applied on the map.

The input gathered during this exercise will prepare and feed a deeper conversation on causality to be held in the next exercise.

EXPERIENTIAL LEARNING

Through this exercise, the Project team and key Project stakeholders will continue reflecting about the way/s through which Project interventions interact with the system leading to deforestation in the target landscape, while building a shared understanding of the key leverage points for change.

2.3. Review Project impact pathways

Purpose: To refine the Project impact pathways and implementation strategy, considering their interaction with the complex system dynamics leading to deforestation in the target landscape, through leveraging existing evidence of progress, learnings from implementation, and the situated knowledge of key stakeholders.

Method: Facilitated workshop engaging the Project team and key Project stakeholders.

Resulting Product: Adjusted impact pathway/s and implementation strategy for each Project intervention.

Suggested Length for in-person workshop: 1 full day.

This exercise is an extension of exercise 1.3. proposed at Project start. At this stage the Project is expected to have progressed – at least to some extent – towards the achievement of its outcomes, while at the same time gaining further insights about the context and system in which it is operating. Therefore, this exercise will extend the review of potential/expected impact to incorporate a sensemaking process focused on the existing evidence of progress to-date.

Through the exercise, the following key questions are investigated:

- Have the Project interventions contributed to reducing deforestation in the target landscape?
- If not, are they (still) *expected* to contribute to reducing deforestation in the target landscape?
- If not, what should be adjusted in the Project ToC and implementation strategy?

The findings are then used to support adaptive management.

The exercise should start with an opening presentation of the latest information on deforestation (flow) and forest cover (stock) trends (*what has changed since Project start?*), and of the existing evidence of changes in the key drivers addressed by the Project (from outcome monitoring).

Then, as per exercise 1.3, the broader group of participants should be divided into smaller intervention-focused working groups, each led by the team member most familiar with the particular intervention, and engaging the most relevant stakeholders. One group should be dedicated to exploring how to address any gaps (including any additional leverage points identified) emerging from the review of Project impact areas.

Looking at the Project **impact pathways** developed or upgraded at Project start (please refer to Insight 7 on p. XX for an introduction to the concept of impact pathways), each group should be guided by the Project team member in a reflection shaped around the following questions:

- What evidence exist that the Project outcomes (related to the intervention) are materializing? Were any emerging outcomes (including intermediate ones) identified[32] , which could be linked to the implementation of the Project interventions?

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[32] As previously mentioned in this guidebook, Project teams running interventions in complex systems are strongly encouraged to dedicate resources to exercises such as *outcome harvesting*, which would allow them to capture emerging outcomes in conditions of uncertainty.

- What other evidence is supporting the validity of impact pathways (i.e. that the implementation of Project interventions is leading to the assessed outcomes? And outcomes to impact?) What further evidence is needed (and should be gathered) to support this level of assessment? Appendix G can help the facilitator to structure a robust causality assessment, while acknowledging the status of implementation of the Project interventions.
- Looking forward (if relevant), and referring to the updated landscape system map, which contributing factors/enabling conditions (see Appendix F) may affect the realization of the intermediate outcomes (with a supporting, hindering, or amplifying role)? The group here should also review the possible effects of feedback loops on the intervention's impact pathway. The identified contributing factors should be added alongside the intervention's impact pathway (aim is to move from a linear to a complex impact pathway, see Insight 7).
- Are the key assumptions holding? Should anything be added/adjusted? Here the list of assumptions should be updated based on the working group's discussion.
- Looking at the broader system map, are there any other wider system effect that might be caused by the Project intervention? If so, add them to the impact pathway.

This exercise is expected to result in concrete adjustments to each intervention's impact pathway and assumptions as needed; the process is expected to be iterative, and the team member facilitating the group should not hesitate to get back to previous questions at any time during the discussion. The resulting impact pathways will then be used to propose adjustments to the interventions' implementation strategy.

The working group focusing on Project gaps should reflect on whether additional interventions are needed to bring about the desired impact, focusing firstly on the relevant impact pathways and then developing a proposed implementation strategy (see scenario B below). The latter can then either be covered by the Project or proposed for additional funding. The exercise can also take the form of considering adjustments to existing interventions to ensure that any additional outcomes (from the gap area/s) can be achieved.

After having discussed and adjusted the intervention's impact pathway, the working groups should move to the intervention *implementation strategy*, which should be first presented by the Project team member, and then discussed within each the working group, drawing on the following questions (more can be added, as needed) – divided in two scenarios. The team member leading the group discussion should pick the most suitable scenario, based on the level of achievements to date.

Scenario A – original intervention's expected outcomes already achieved or very likely to be achieved:

- Drawing on the adjusted impact pathway/s, what additional activities (or extra interventions) could strengthen the likelihood that the outcomes will contribute to the expected impact of reducing deforestation in the landscape?
- Are feedback loops adequately considered in the Project implementation strategy? If not, how should they be addressed?
- Can the Project achievements be sustained over time? If not, what needs to be done to ensure sustainability?
  What are possible ways and opportunities for expanding, adapting, and sustaining results over time for greater development impact?

Scenario B – uncertain whether the original intervention's expected outcomes can be achieved:

- Looking at the adjusted intervention's impact pathway/s, is the existing implementation strategy likely to bring about the expected outcomes, and thus affect the relevant system impact area as expected? If not, what other intermediate outcomes should be addressed? And how? <mark>Appendix F</mark> can help framing this discussion.
- What is working well and should be maintained? ([check resource on Appreciative Inquiry](#)) What should be adjusted?
- Are feedback loops adequately considered in the Project implementation strategy? If not, how should they be addressed?
- Based on the previous discussions, should any elements of the assumptions be targeted through (additional) specific actions as part of the Project (or non-Project) intervention/s? Which and how? Will the other assumptions be adequately monitored?
- Looking inward, what are critical outputs to be delivered to achieve the intermediate outcomes[33]? What are critical inputs (see Appendix F), and enabling conditions, including implementation of other interventions (including policies, see Appendix A)? What partnerships should be sought??

The above questions should help the working group to propose concrete adjustments to the current implementation strategy. These should be logged by the Project team member leading the discussion, and will be used in the following step.

EXPERIENTIAL LEARNING

Through this exercise, the Project team and key stakeholders will further deepen their understanding of impact pathways and implementation strategy of the Project interventions, and how these interrelate with the complex system dynamics driving deforestation in the landscape.

More in general, the Project team and key stakeholders will also gain a deeper understanding of Theories of Change, the concept of causality, and the importance of evidence to monitor progress, and their relevance for designing effective interventions.

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[33] Beyond resources, these could obviously also include e.g. a proper development of social and environmental safeguards, stakeholder engagement, and resource mobilization efforts.

2.4. Adjust the Project ToC, strategy, and results framework

Purpose: To adjust the Theory of Change, implementation strategy and results framework of the Project, leveraging the information gathered through the previous step.

Method: Facilitated workshop engaging the Project team and, optionally, key Project stakeholders.

Resulting Product: Adjusted Theory of Change, project implementation strategy and results framework.

Suggested Length for in-person workshop: half a day.

At this stage, the CALI Project team could decide to continue with or without the representatives of key project stakeholders. If the latter, it is recommended that a briefing note is developed and shared with them to inform them on how the inputs collected during the previous steps informed an adjustment of the Theory of Change of the Project, and its strategy and results framework.

The following exercises were thought for in-person workshops to be delivered with the support of prints, drawing boards, sticky notes and other relevant tools at the discretion of the workshop organizers and facilitator. Nevertheless, it should be explicitly mentioned in the ToR of the CALI PM, external facilitator or other relevant CALI project team member, t hat all three resulting products should be converted to a digital version.

2.4.1. Adjusting the Theory of Change of the Project

Looking at the revised impact pathways and assumptions resulting from the working group discussions in the previous step, the CALI project team (with or without the representatives of key stakeholders) should now engage in a final review, sensemaking and upgrade of the overall Theory of Change of the Project.

Indeed, the Project impact pathways revised in the separate working groups, would in most cases have numerous touching points, and without engaging in this final step, the CALI project team would likely be missing the opportunity to do a final refinement of the ToC through looking at synergies, which will subsequently inform the dentification of opportunities to boost the Project implementation strategy.

First, the CALI PM (or other designated member of the CALI project team) should develop a draft of an upgraded ToC through merging the different impact pathways, underlying assumptions, and logging any questions emerging through this process. Then, the CALI PM (or other designated member of the CALI Project team) should lead a discussion with the workshop participants, aimed at delivering a final, upgraded, and validated version of the Project ToC. The following questions should help to drive the discussion:

- Are there any immediate questions emerging through looking at the draft ToC?
- Looking again at the landscape system map, does the team feel confident that the upgraded ToC adequately describes the dynamics of change processes in the identified system impact areas? Are there any key factors missing? Any additional assumptions that should be logged?
- Are feedback loops adequately accounted for in the upgraded ToC?

The facilitated discussion is expected to result in final refinements to the upgraded ToC, which should then undergo a final validation round. [add reference to example 1.4.1]

2.4.2. Adjusting the Project implementation strategy

Once agreed on a final ToC, the Project team should engage in a Project-level discussion about the proposed adjustments to the Project implementation strategy. First thing first, the team members leading the working group discussions under 1.3. should be presenting the proposed adjustments to their implementation strategy, and why these would increase the likelihood of delivering an effective intervention. Then, they should be taking questions and feedback from the Project manager and other colleagues; this is expected to inform final adjustments to the implementation strategy of each intervention.

This exercise is expected to be conducted iteratively with the following one on Results.

The following questions should help guide the discussion:

- Adopting both an intervention and Project perspective, which activities (or suites of activities) should be modified or extended?
- Which activities or additional interventions should be added? Which activities (if any) should be discontinued?
- Are any partnerships with other actors or Project stakeholders critical for the Project to be successful in its endeavor of reducing deforestation?
- How can the project leverage additional funds to cover critical activities/interventions that need to be added? Or work in partnership with other organizations?

The facilitated discussion is expected to result in final refinements of the Project interventions and expected Results. [add reference to example 1.4.2]

2.4.3. Adjusting the Results framework of the Project

This exercise is expected to be conducted in an iterative way with the 2.4.2., as brainstorming about results will help the project team reflect more deeply on their implementation strategy.

Workshop participants should identify and phrase together the expected Results to be achieved by the Project (in case these are to be updated) and otherwise validate that the expected Results are still valid. [add reference to example 1.4.3].

From here, the Project team should move on to update their logical framework, through adjusting the key outcome, output and process indicators to be monitored during implementation. These can obviously consist of both quantitative and qualitative indicators, and should be done following general guidance on developing quality indicators. If budget allows, it is always recommended that additional methods such as outcome

harvesting are adequately planned for to also capture emerging (unplanned) outcomes, so to inform further adjustments of the Project's ToC.

EXPERIENTIAL LEARNING

This exercise will provide the Project team with a *thorough, common* understanding of the Project objectives, implementation strategy and expected results. The Project team will also strengthen their understanding of how a Theory of Change and implementation strategy relate to each other, and the overall context in which the Project is operating.

EX-POST APPLICATION OF CALI – AFTER PROJECT CLOSURE

In most development interventions aimed at promoting systems transformation, the targeted longer-term outcomes, by nature, will take some time to materialize – in most cases exceeding the lifespan of a Project.

Hence Projects – or, more likely, programmes – may find it useful to commit an ex-post application of CALI (after Project closure) to investigate the validity of the Project's ToC after the end of the Project interventions. Have longer-term expected changes materialized? Why/Why not? What could be done to increase the likelihood of change materializing?

This application follows the same steps as the 2nd application of CALI with the following adjustments.

After completing step 2.1. and 2.2., the CALI Project team will focus the "Review of Project impact pathways" (step 2.3) on investigating whether the outputs delivered by the Project have led to the expected outcomes, and, if so, whether these have contributed to the expected impact – following the guidelines in Appendix G. As previously discussed in this guidebook, an outcome harvesting exercise is recommended to be conducted in preparation of (or together with) the CALI assessment to identify emerging outcomes.

After having adjusted the interventions' impact pathways as per in step 2.3., in this case, the CALI Project team shall not engage in a revision of the implementation strategy of the interventions of the closed Project, but rather identify whether additional interventions – within the framework of a new project – may build on the achievements to date to increase (or scale) progress towards reducing deforestation in the target landscape.

Step 2.4., finally, shall be adjusted to result in the development *ex-novo* of a ToC for a potential new project, together with its implementation strategy and results framework.


EXPERIENTIAL LEARNING

This exercise will provide the Project team with a *thorough, common* understanding of the effectiveness of the completed Project interventions. If a team different from the Project team will engage in the assessment, they will have a chance to learn from the implementation of the Project, connect with the landscape stakeholders, and deepen their understanding of the system driving deforestation in the landscape.

APPENDICES AND ANNEXES

Appendix A: Visualizing interdependencies between interventions

To support the reflection on interdependencies among landscape interventions (see point 3 of the Prerequisite _A holistic view of landscape interventions and their interdependencies_), it is recommended to develop a diagram visualizing the _actual, expected_ and/or _eventual_ links between relevant Project and non-Project interventions, such as the one shown in <mark>Figure X</mark> below.

Example

Figure 8: Co-dependent interventions diagram.
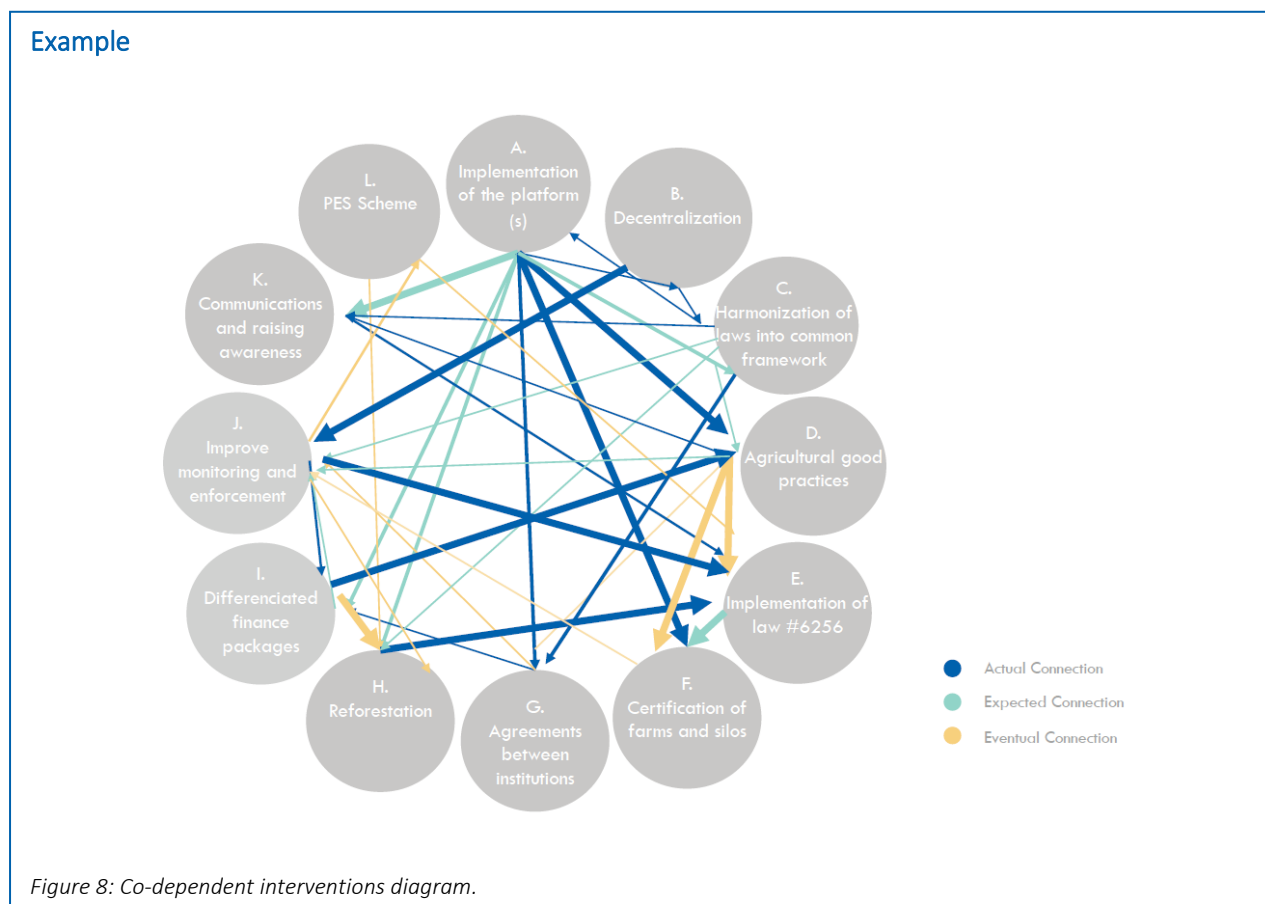
Detailed steps are presented below.

1. **Create one bubble for each intervention implemented in the landscape and start connecting them with arrows indicating how they (should) relate to and enable (or hinder) each other**; the arrow should begin with the enabling (hindering) intervention, and end at the enabled (hindered) intervention. This can include feedback loops between two or more interventions (to show this, add additional arrows as needed). It is recommended to use different notations for enabling (+) and hindering (-) relations.

2. Identify, e.g. through the use of different colors (such as in the example), where the connection is *actual* (one intervention is actively enabling or hindering another one, and this can be demonstrated with evidence); *expected* (not yet materialized, but written in the project document, or partnership agreement) or *eventual* (there may be potential for co-dependency but it was not yet explored in detail)[34]. This exercise will be particularly useful to support the review of the Project impact pathways (at any stage of application of CALI) and should be updated by then.

3. Adjust the weight of the arrow[35] depending on the *strength of the relationship between interventions:*

    a) A thin arrow indicates there may be a relationship between the interventions, but it is unknown and/or not a strong relationship.

    b) A medium weight arrow indicates there is an actual or expected relationship between the interventions – either one enables (or hinders) the other, or they enable (or hinder) each other in a complementary way.

    c) A thick arrow indicates there is a very strong relationship between the interventions – one is necessary to enable the other (or strongly hinders it), or simultaneous co-implementation is required.

For each arrow, a brief causal explanation for the direction and weighting should be provided, ideally in a tabular format to complement the drawing.

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[34] This diagram can include interventions with any implementation status, including those not yet being implemented, as it is useful to know if un-implemented interventions are needed to enable others currently attempting implementation.

[35] Alternatively, the CALI Project team may want to use symbols on the arrows to indicate the strength (++, +, -, - -). This would be more coherent with the notation of the System Map.

Appendix B: Impact monitoring

At any stage of Project implementation, the Project team should be able to present and comment on the latest changes in the key impact variables in the landscape[36]: forest cover and deforestation. That requires the capacity to develop (or access), in writing and visually, an analysis of the current situation of forest cover and deforestation in the landscape and compare it with historical trends. This is critical information that will be used to inform application of CALI at any stage of Project implementation.

Unless reliable information can be accessed from third parties, the Project team must then gather and analyze in-house the latest data on the evolution of forest cover (stock) and deforestation rate/s (flow) in the landscape, mapping it visually and comparing it with the latest trends (covering at least the previous 5 years). To this end, the Project team should prioritize the use of data generated through national forest monitoring systems (NFMS)[37], whenever these are sufficiently elaborated and capable of providing timely and good quality information[38].

If only limited information is available through NFMS, other data sources can be considered, such as the global database put together by Hansen et al., which can be consulted through different web-based platforms including the Global Forest Watch, Earth Map, and others. A possibly valid proxy variable here is tree cover, defined as *all vegetation greater than 5 meters in height, [which] may take the form of natural forests or plantations across a range of canopy densities* (Hansen et al., 2013)[39].

Table 3: key impact variables, with their description and recommended data sources.

Impact variable	Description	Suggested Data Sources
Forest Cover	Area of landscape covered by forest with a set threshold canopy cover (ha)	Priority should be given to data from national forest monitoring systems (NFMS).
Rate of Deforestation	Gross and net annual deforestation rate in the landscape and inside key land zoning	In the absence of the latter, the CALI Project team may want to refer to the global database compiled by Hansen et al., which can be

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[36] It is critical that information is collected and presented at the landscape level. If any data gaps at this scale, these should be noted, and a plan should be developed on how to address them. Meanwhile, smartly crafted proxies can provide an approximate picture of the evolution of key variables in the landscape.

[37] The *National Forest Monitoring Systems* learning journal developed within the framework of the REDD+ Academy can be consulted as needed for insights into how NFMS are developed and implemented.

[38] Tropical forest countries engaged in REDD+ readiness and implementation efforts generally have the capacity to produce good quality (geo-spatial) data on forest cover (including its evolution over time), having invested in developing increasingly robust NFMS. National governments can be quite sensitive about their national data, and using any other data – see e.g. data from the global platform recommended in the following paragraph – can be a serious bone of contention. It will be also important for the Project team to ensure consistency with national GHG inventory data for the forest sector (connected with the NFMS) and REDD+ data as much as possible. More specific details on *Forest Reference Emission Levels for REDD+* can be consulted via the homonymous learning journal, which can be accessed through this link.

[39] See Appendix C: Sample quantitative baseline indicators for additional guidance on data sources and proxies.

	areas (e.g., protected area, indigenous land, concessions)	accessed through platforms such as Global Forest Watch, Earth Map, and others.

It is recommended that the following three products are generated (or updated), as a minimum, in preparation of application of CALI at any stage of Project implementation:

1. A Landscape Map demarcating clearly the landscape boundaries, and showcasing land cover types, and land-use changes over e.g., the last and previous 5 years (though the time period can be defined by the Project team as suitable), with a priority focus on those affecting forests. Key local areas suffering significant deforestation should be identified.

2. Graphs visualizing the evolution of forest cover (stock), deforestation (flow), and any reforestation (flow)[40] over recent years within the landscape boundaries[41].

3. A short, written description (one paragraph) of the evolution of the above-mentioned stock and flows (e.g., commenting on peaks and trends, highlighting the dimension of yearly tree loss, etc.) to support communications with stakeholders and further analysis.

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[40] And/or any other relevant metrics related to the impact of human activities on forest areas in the landscape.

[41] If interesting, this can be compared to the same metric beyond the landscape boundaries, at regional or national level.

Appendix C: Additional Recommendations for Context and Outcome monitoring

In addition to the Project indicators defined in the Logical Framework, the Project team may want to review periodically the evolution of selected contextual variables linked to deforestation, such as the ones presented in table 4 below. Data availability will obviously play a role in informing the selection[42], though the Project may decide to engage in primary data collection for key variables.

Table 4: non-exhaustive list of contextual variables linked to deforestation (relative importance varies from context to context).

Variable	Description	Suggested Data Sources
Forest Fragmentation	Categorization and quantification of forest cover based on connectivity and fragmentation.	NFMS or Vogt, P. (2013). GUIDOS: tools for the assessment of pattern, connectivity, and fragmentation. 13526. Available online at: http://forest.jrc.ec.europa.eu/download/software/guidos/mspa/
Rainfall and temperature	Average annual or monthly rainfall and temperature for an analysis of temperature and rainfall trends over a period and quantification of frequency of extreme events	National data-sets or Funk, C., et al. "The climate hazards infrared precipitation with stations—a new environmental record for monitoring extremes". Scientific Data 2, 150066. doi:10.1038/sdata.2015.66 2015. Available online at: http://chg.geog.ucsb.edu/data/chirps/
Agricultural Productivity	The average annual yield of the major agricultural products per unit of area (e.g., kg/ha)	[Field survey and/or government census]
Agricultural Production	The average annual yield of the major agricultural products (e.g., kg)	[Field survey and/or government census]
Area under Cultivation	Average area of a farm under different agricultural cultivation	[Field survey and/or government census]
Population and Population density	Number of people and people per sq. km, disaggregated by gender, age and/or rural and urban	[Government census] or Dobson, J., et al. "LandScan: a global population database for estimating populations at risk." Remotely Sensed Cities Ed. V. Mesev, London: Taylor & Francis. 2003. 267-281. Available online at: http://web.ornl.gov/sci/landscan
Rate of Employment	Number of employed people vs number of people living in a community	[Government census]
Income per Household	Amount of income generated per household	[Government census]

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[42] For variables for which data is not available or the data is not at the proper scale, it is recommended to start by thinking of a proxy. For example, if average yearly income per household is not available, perhaps household access to amenities like clean water or electricity could serve as a proxy.

Poverty or Human Development Index	Percentage of population in poverty.	[Government census] or Progress out of Poverty Index from www.progressoutofpoverty.org; USAID's Poverty Assessment Tools from http://www.povertytools.org/ ; UNDP's Human Development Index from http://hdr.undp.org/

It is recommended that baseline information on impact and context variables, as well as on Project indicators, and their updates throughout implementation, are presented in a Project dashboard such as the one shown in Figure 11. Annex 3 includes a simple template aimed at supporting the Project team to generate a similar dashboard[43]. The selection of the information covered in the dashboard should be updated after each application of CALI, which culminates in adjustments to the Results Framework. An updated landscape system map and Project ToC may trigger substantial changes to the selection of information shown in the original dashboard.
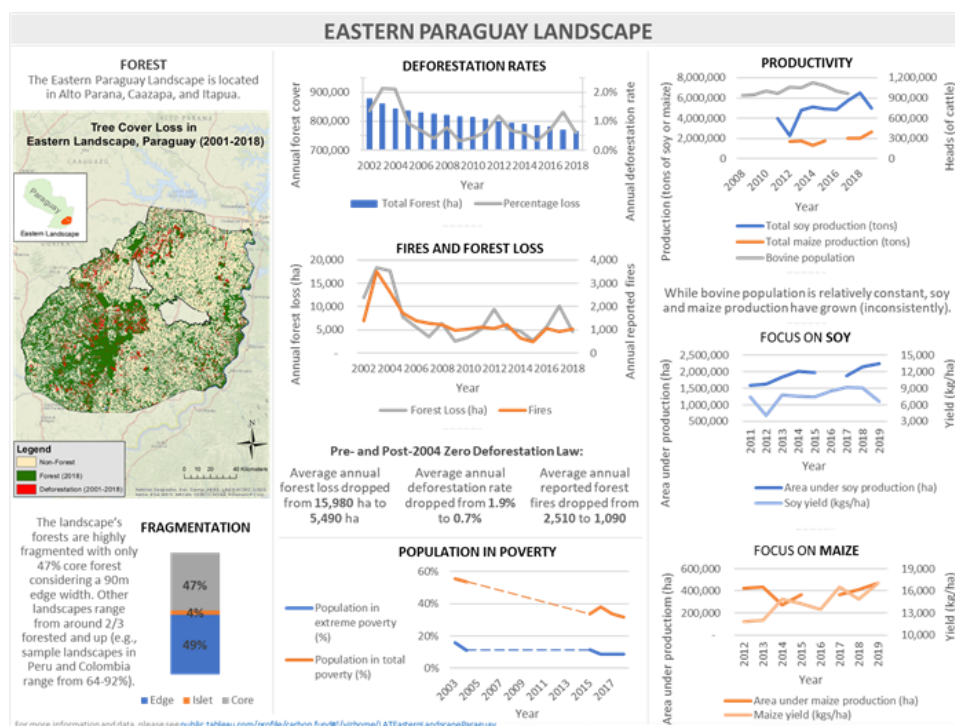

Figure 9: Example of static quantitative dashboard including impact and context variables, alongside outcome indicators.

Displaying these key metrics in an accessible dashboard format provides additional guarantees that this critical information is used to support reflection throughout Project implementation, and as part of the application of CALI. A functional understanding of data visualization, and (at least) basic capacity to manipulate geospatial datasets are required.

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[43] More advanced dashboards can be made using interactive data visualization software (e.g., Tableau, Power BI, Google Data Studio).

Appendix D: Roles and responsibilities of the CALI project team

The CALI Project team should include:

➔ A CALI project manager (CALI PM) – the MEL Specialist of the Project or other Project member with a solid MEL background. The CALI PM is responsible for preparation and implementation of each step of the application of CALI.

➔ A Project technical referent – the Project manager or coordinator of the Project, or other key technical counterpart holding an overview of the Project ToC, objectives, and interventions.

➔ A CALI lead facilitator (CALI LF) – a skilled, external facilitator (ideally this figure should remain the same for all applications of CALI) with a strong background in evaluation, systems and critical thinking, and using participatory methods. The CALI LF is in charge of leading all the workshop portions, organize inputs, analyze findings and develop the expected products, including an upgraded Project ToC, implementation strategy and results framework. A sample ToR for the CALI LF is provided as Annex 4.

➔ A CALI data analyst (CALI DA) – the Data Analyst of the Project, or other Project member skilled with manipulating quantitative and qualitative data, including geo-spatial data. The CALI DA is in charge with ensuring availability of data and analyses in support to the implementation of CALI.

➔ A responsible for stakeholder engagement (CALI SE) – the Stakeholder Engagement Officer of the Project, or other Project member/s managing stakeholder relations. The responsible for CALI SE needs to ensure participation of the representatives of key landscape stakeholders in the assessment.

➔ A system mapping expert (CALI SM) – this can either be a Project member or an external consultant, although we expect that most Projects will prefer to go with the latter. A sample ToR for a system mapping expert can be accessed through Annex 5.

If needed, some of these roles can be covered by the same person, provided that the availability of the above-mentioned skills and requirements is ensured.

Appendix E: Developing a landscape system map focused on deforestation

To support the creation of the landscape system map through visualizing the different steps, references are made to an exemplary map for a fictional landscape. The full example map is shown in Figure 6 (p. 17).

Forest cover (stock) is the focus point of the analysis and therefore the central variable of the System Map. The forest cover in a landscape can change in two ways (flows): either (i) deforestation leads to a decrease in forest cover or (2) reforestation/afforestation leads to an increase in forest cover (see figure E1 below). The process of reforestation/afforestation, though, is delayed as it takes time before the activities actually restore the forest cover. In the system map, the "II" symbol represents a causal effect with significant delay. The '+' and '-' are the polarities and will be described within the exercise. If reforestation/afforestation is not part of the landscape development and therefore is not an important factor for the evolution of forest cover, the CALI project team might choose to exclude reforestation/afforestation from the workshop discussion and solely focus on the drivers of deforestation.

Figure E1: Deforestation and Reforestation are the two flows affecting the stock of forest cover in each landscape.

A Root Cause Analysis (RCA) or other similar exercises conducted during project design can provide valuable input for initiating the development of the system map. Similarly, findings, conclusions, and/or recommendations from any other relevant studies (possibly exploring causality between deforestation and its direct or indirect drivers, e.g. the expansion of agricultural production) conducted within or outside of the Project framework - for example, as part of national REDD+ processes and strategies[44] - should be considered, fed to participants and/or leveraged upon to complement the output of this exercise[45].

To document the landscape system map and information collected in this step, a variety of software can be used, ranging from Microsoft Word, Excel, or PowerPoint to more specialized software such as Miradi[46] or Kumu

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[44] The *National Strategies or Action Plans* learning journal developed within the framework of the REDD+ Academy shall be consulted for further insights into how these are developed as part of REDD+ processes and linked with national objectives and development frameworks. Further details on *Policies and Measures for REDD+ Implementation* can also be explored through the homonymous learning journal.

[45] For example, through national REDD+ process, many country governments have developed analyses of the causes of deforestation. Though these studies are often focused at national or regional level, they still provide valuable input to landscape-level analysis - and as such, it is recommended that they are critically reviewed, compared to specific local dynamics and, in general, considered as important inputs and complements for the development of the landscape system map.

[46] Miradi (www.miradi.org) is a software to document, visualize, and manage project design, implementation, and adaptive management.

(which is recommended as it is specifically developed for creating system maps)[47]; other proprietary tools such as Miro and Mural allow for remote workshops and live interactions with participants while providing the necessary functions to create system maps. The CALI Project team can either decide to follow the 3 steps below or recur to the System Mapping toolkit developed by the Systemic Design Group and incorporated into the CALI Miro toolkit.

1. Problem statement.

To start mapping the system leading to deforestation in the landscape, the Project team and stakeholder representatives should first be clear about what the problem is. A problem statement can provide this clarity. It allows the CALI Project team to communicate the purpose precisely and to streamline the discussions of the participants during the workshop.

Explain in one short paragraph what the problem is, why it is important and urgent, who is affected by it, and which other problems it perpetuates. This can be taken from the project document and updated as needed. The statement can include a question that helps to frame the issue in terms of an aspirational and actionable goal.

Example of a problem statement: "The forest cover in the landscape has decreased by 30% within the last 15 years. Most of the land is now used for agricultural production instead. The continuous deforestation contributes to the temperature rise and increases the water runoff and soil erosion. These effects have negative impacts on biodiversity and the fertility of the landscape which ultimately also weaken the agricultural productivity in the long-term. How might we provide sustainable agricultural practices to support socio-economic development while protecting the forest landscape?"

2. Framing.

The facilitator should present to participants a landscape map with an associated analysis of the development of forest cover in the landscape, together with the problem statement. At this stage, the workshop facilitator may want to ask participants whether the evidence shown is surprising, or anyways try to capture the level of awareness around the evolution of forest cover dynamics in the landscape. Taking into account the composition of the participant group and the sensitivity of the topic in the local context, participants may be encouraged to share comments, and a brief, moderated discussion could follow.

3. Identify direct drivers.

In this activity, we will start developing the System Map by identifying the most important direct drivers of deforestation as well as barriers to reforestation[48]. *Direct drivers* are the processes or human activities that

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[47] More standard resources can always be complemented with scanned images of hand-drawn diagrams or diagrams from free online systems mapping programs if needed.

[48] Note on terminology: the following pages will be referring to *drivers of deforestation*, however the CALI Project team and facilitator should be mindful that there may also be *barriers to reforestation*, the other key variable impacting the evolution of forest cover. These shall be identified and considered in a similar way to the drivers of deforestation (with a negative impact on the evolution of forest cover) throughout the whole process.

directly cause deforestation or influence reforestation in the landscape[49]. <mark>Insight 4 on p. 31</mark> provides some examples.

In a workshop setting, the CALI Project team may want to split the participants into mini-groups of 2-3 individuals and distribute some notecards per mini-group (*suggested notecard color: pink*). Each mini-group collectively decides and writes the four most important direct drivers influencing deforestation – one direct driver per notecard.

Each team should briefly present their note cards starting with the driver of highest importance. The facilitator collects the notecards and groups similar direct drivers together. After every group presented their drivers, identify the top four drivers for deforestation.

Present the top four direct drivers that will be used in the subsequent analysis to the participants. They should generally agree that these are the most important direct drivers. If the participants think a very important direct driver is missing, an additional driver can be added to the analysis.

Draw the connections from the direct drivers to deforestation. Add the polarity and – if necessary – a delay to the connection. The polarity indicates how one factor influences the other while the delay indicates a significant time lag between cause and effect:

a) A *positive polarity* ('+') means that cause and effect are moving into the same direction meaning if the causing factor increases then the influenced factor also increases. Alternatively, if the causing factor decreases the influencing factor also decreases.

b) A *negative polarity* ('-') indicates that the factors are moving into opposite directions meaning that an increase in the causing factor leads to a decrease of the influenced factor (and vice versa).

c) If there is a significant *delay* between the cause and effect, then this should also be marked in the connection ('II').

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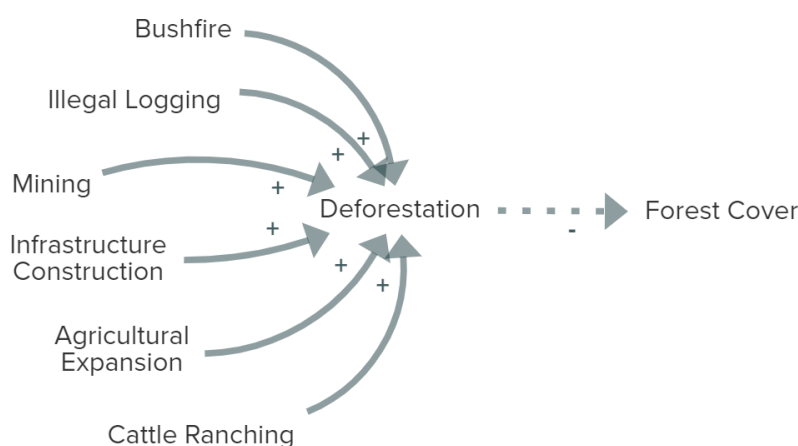
[49] The *Drivers of deforestation and forest degradation* learning journal developed within the framework of the REDD+ Academy may help the CALI Project team and facilitator to gain an overview of the general drivers of deforestation and barriers to positive developments. It can be accessed through this link.

Figure E1: Example of direct drivers for deforestation. Limit your choice to four direct drivers to focus your analysis on the most important dynamics.

Facilitation tips:

- To best avoid bias in responses and solicit the most honest inputs, do not frame the direct drivers and contributing factors as if any actor is wrong. In essentially every case, people are not cutting down trees because they enjoy cutting down trees, but rather as a way to provide for themselves and their families. Understanding what truly drives this behavior is the only way to design and implement the most effective interventions to change these behaviors.

- Focus on the identification of direct drivers. Some of the drivers by the participants might influence deforestation or reforestation but rather indirectly through other drivers. Explain the difference to the participants and note that these indirect drivers will be reflected in the subsequent exercise identifying contributing factors.

- [*Optional*] **Development of direct drivers**. To better understand the influence of direct drivers and help the participants to think about dynamics over time you can develop behavior-over-time graphs together with the participants. Split the participants into pairs and let them choose one direct driver they are knowledgeable about. The pair should sketch the development of the driver from the past to the present year. The starting year can be chosen by the participants but – in the best case – should correspond with the time period presented for the development of the forest cover in the previous activity. The participants can research data for this activity or – if data is not available – sketch the development of the driver based on their personal perception. Each pair presents their behavior-over-time graph followed by a short discussion.

4. **Map the contributing factors.**

In this activity, you will dive into each direct driver and aim to understand causal influence of contributing factors. *Contributing factors* are those factors that enable the occurrence of direct drivers (also known as underlying causes)[50]. Appendix F provides 5 general categories of enabling (or hindering) conditions and inputs which may help guiding the brainstorming process.

Starting with one of the direct drivers, ask the participants what factors directly influence the direct driver or enable the direct driver to occur. Participants can name factors and should briefly explain the influence.

These contributing factors should be linked with arrows to the direct driver(s) they influence and continue to be built out moving from right to left – one contributing factor per notecard (*suggested notecard color: orange*). The connection should also indicate the polarity and potential delays. Once one direct driver has been dissected, the team should move on to the next. If the facilitator or one of the participants identify feedback loops during

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[50] Among the others, these may include factors such as the role and maturity of international and national markets, legal frameworks, and/or the country policy vision.

the discussion, these can be included in the map and briefly explained to the group. Subsequent activity 6 will focus specifically on feedback loops.
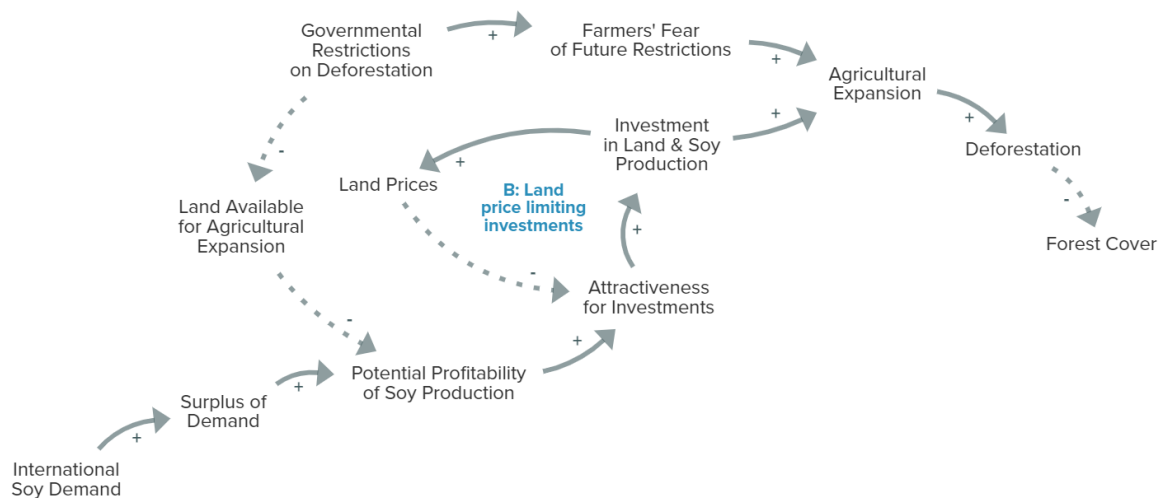

Figure E3: Example of contributing factors of the direct driver agricultural expansion with a first balancing feedback loop.

After mapping the contributing factors of two direct drivers in the plenary and if the participants are comfortable with the process, you might choose to split the participants into groups each focusing on one direct driver. The facilitator should support the individual groups. At the end, each group briefly presents their results and gives other participants the chance for questions and feedback. Merge similar factors into one factor so that there are no duplicates among the contributing factors.

Facilitation tips:

   a) As a facilitator, consider renaming a factor if it eases communication or to add an intermediate factor if it helps to improve the clarity of the causal connection.

   b) Participants should be allowed to discuss the factors and causal connections in the group to reach a consensus and develop a shared understanding. However, long or sprawling discussions should be moved to a "parking lot" and postponed to a later stage. Most of the discussions might be cleared through the progression of the workshop before getting back to the points on the parking lot.

   c) During this exercise, it is good to refer to the stakeholder analysis, given it is impossible to include every stakeholder in a workshop setting. Have the needs and behaviors from all stakeholders – particularly those with "high" influence and/or interest – been identified and included?

   d) The facilitator should continue probing for more contributing factors until the group has reached the point of identifying contributing factors far outside the control of the landscape and project (e.g., international demand, cultural preference). Probing questions include: Who is involved in these activities? What are they doing and why? What incentives and disincentives influence the direct drivers and underlying factors? What economic, political, institutional, social, or cultural factors contribute to this pressure?

e) The facilitator should ensure that the factors discussed reflect the diversity of the elements within the system. Typical dimensions that are part of a complex systems are the *structures of the physical world* (e.g., forest area, population size, resources, infrastructure, workforce), the *transactions or processes* (e.g., production, taxes, migration, consumption, demand, laws) and the *emotions and attitudes* of the actors (e.g., life quality, security, need for housing, awareness, fear).

f) Many contributing factors may be phrased as "lack of…" or "need for…" or "existence of…" but some factors may be uncomfortable to write up on a notecard in certain situations (e.g., corruption, culturally large family sizes), so the facilitator must maintain a sensitivity for the topics that may arise.

5. Identify direct effects and map consequences.

In this activity, you will focus on the effects of changes in forest cover and the wider consequences of decreasing forest area within the landscape. If time with stakeholders is limited, this activity may also be prepared by the CALI Project team ahead of the workshop and presented to the participants for shared learning and validation.

Follow the instructions of activity 3 to identify the four most important *direct effects* of forest cover. *Direct effects* are the processes that are directly caused by the change – particularly the decrease – in forest cover. Note if there are significant delays before an effect takes place. Optionally, develop *behavior-over-time graphs* for the direct effects as described in activity 3.

Consequences are those factors that follow from the occurrence of direct effects. Identifying consequences might be done together in plenary or in smaller sub-groups which focus on the most important consequences of one direct effect.
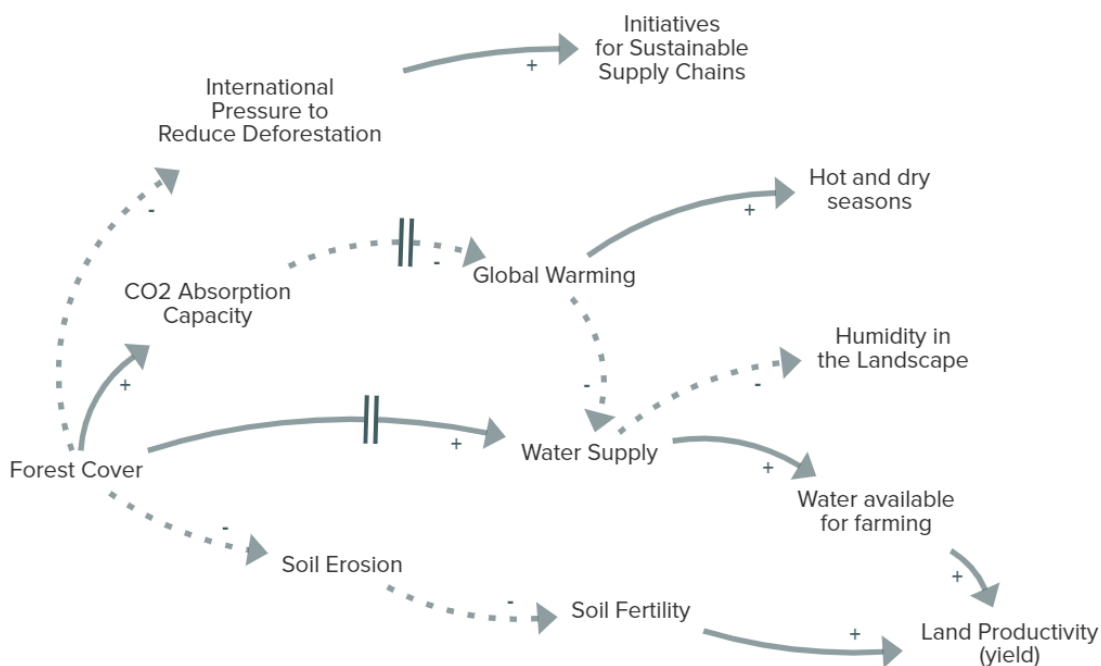
Figure E4: Example of direct effects and resulting consequences of forest cover change.

6. Close feedback loops.

In this activity, you will identify how certain "effects" within the system influence identified "causes" constituting the *feedback loops* of the system. A *feedback loop* is a sequence of factors and causal links that creates a closed ring of causal influences. A *feedback loop* is closed when the effect of a causal chain feeds back to influence the original cause of that effect.

Ask the participants to look at the identified contributing factors and direct drivers. Do they see additional causal influences between the variables – particularly, from affected factors on the right to the causes on the left? What factors drive the identified emotions and attitudes of the actors?
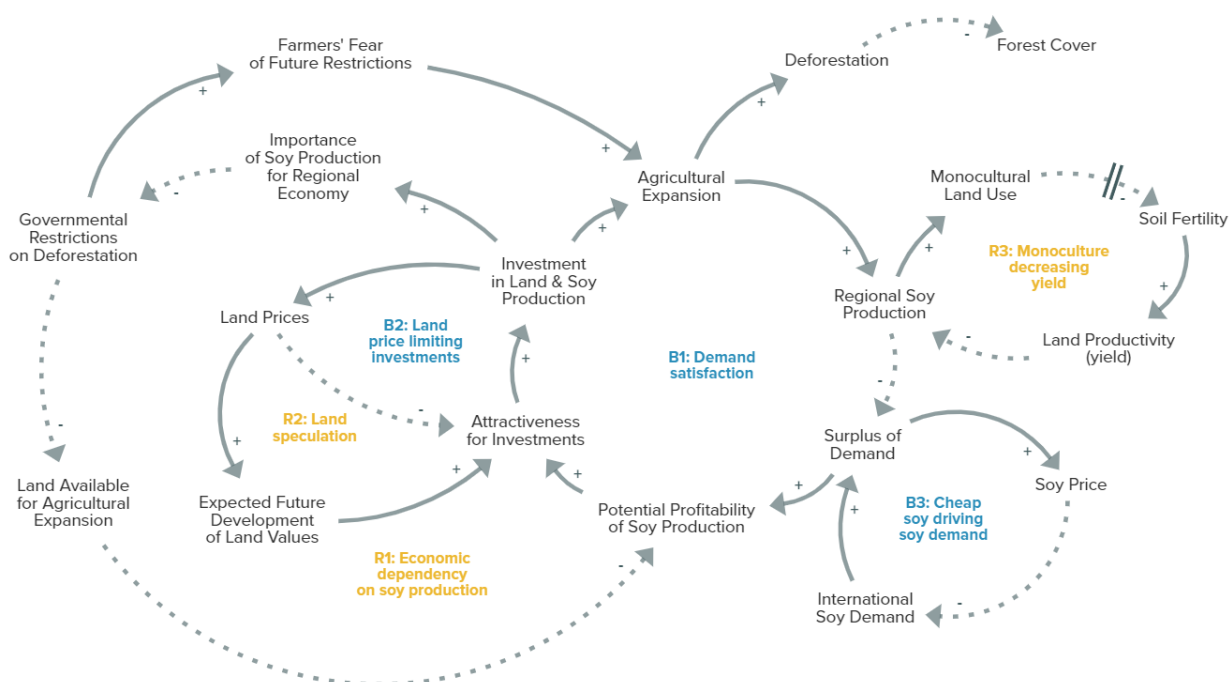

Figure E5: Example of additional factors and feedback loops driving the direct driver Agricultural Expansion. Balancing feedback loops are shown in blue while reinforcing loops are shown in orange.

Afterwards, ask the participants to also take the feedback loops of forest cover change into account. How do the consequences already influence the causes within the system? How do actors experience those consequences? How does the perceived development or assumption of consequences influence the decisions of the actors?

As you close a feedback loop, identify the type of feedback loop together with the participants. Start at one factor of the feedback loop, assume a change (e.g., an increase) and then follow the change through the whole feedback loop until you reach the factor you started with. If the factor would change further in the same direction (e.g., increase even further), then this a *reinforcing loop*. Otherwise, if the factor would be pushed towards the other direction (e.g., decrease), then this is a *balancing loop*. Number the feedback loops for reference and give them a name that describes their dynamic impact.
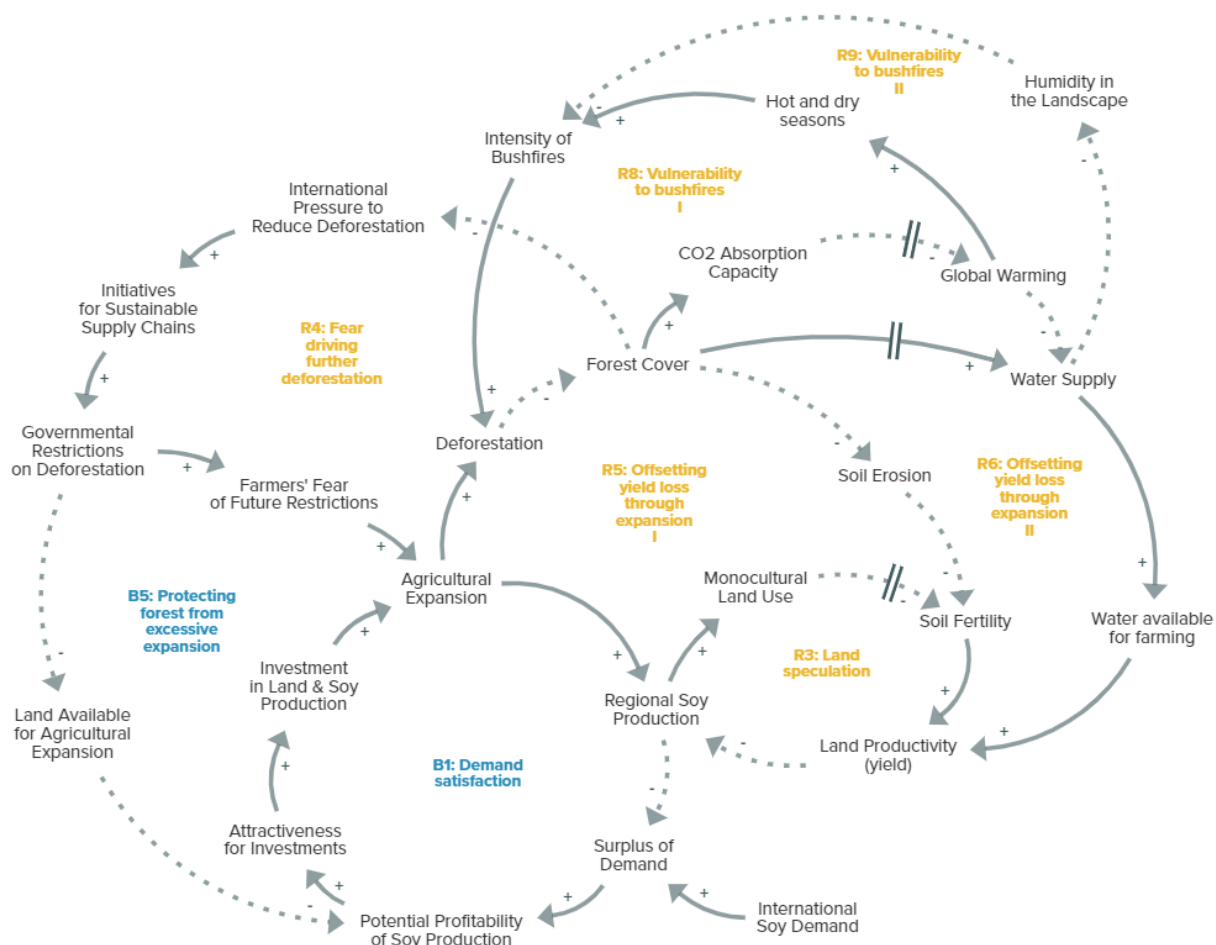
Figure B6: Additional feedback loops by connecting resulting consequences to the driving factors.

7. Reflect on the landscape system map.

Together with the participants, look at the map and discuss the following points:

- Identify factors in the system that have a lot of outgoing connections to other factors. These might be important factors to influence when trying to change the behavior of the system. Then, look for factors with many incoming connections. These could be factors which are difficult to control and therefore must be observed closely.

- Look at your reinforcing feedback loops and identify if they currently have a beneficial impact on the system ('virtuous loops') or if their dynamics are disadvantageous ('vicious cycle'). Virtuous loops should be supported and strengthened through interventions while vicious cycles need to be stopped and ideally, turned around into a virtuous loop.

- Now, look at your balancing feedback loops. Discuss if they have a healthy stabilizing impact on the system ('stabilizing loops') or if they keep the system from improving ('stagnating loops'). Stabilizing loops are important to keep the balance within the system while stagnating loops can hamper or hinder change within the system.

- Finally, think about *leverage points* - important factors where a change could have a positive, wide-ranging impact on the future development of forest cover. Invite the CALI Project team to experiment with different factors and follow the effects along the causal relations on the map. In small groups of 3 or 4, the participants should discuss their reasoning and decide on three factors where they see most leverage to change the system. Let them present their conclusion to the rest of the group. Mark the factors and votes on the System Map.

Appendix F: Enabling (or Hindering) Conditions and Inputs

To inspire most of the discussions proposed in this guidebook (e.g., when identifying contributing factors for the landscape system map, reviewing the Project's impact pathways and/or the interventions' implementation strategy), participants may want to consider five general **categories of enabling (or hindering) conditions and inputs**, as follows:

- Institutional – Policies and Measures (PAMs), governance arrangements, social capital, shared values, political buy-in, public opinion towards a needed change, etc.

- Financial – monetary assets, fiscal conditions, accessibility to finance.

- Human capital – knowledge and productive capacities of the community, existence of "champions".

- Natural resources – ecosystem health, environmental resources, ecological services.

- Other material factors – infrastructure, manufactured assets, etc..

When considering institutions, the CALI Project team might be particularly interested in assessing the status and role of **Policies and Measures (PAMs)** in connection with project implementation to identify benefits and synergies (or hindrances):

- Are necessary PAMs in place in the country?

- What is the level of coherence between relevant policies at national and subnational level (vertical integration), and across same-level policies covering different, but interrelated sectors (horizontal integration)?

- Is the Project taking them into account and building on them?

- If absent, does/can the Project support their development?

Co-dependencies with other Project or non-Project interventions should also be considered here, as some interventions may act as catalyzers for others. In some cases, one intervention may enable the success of another *in a sequence through time* – for example, an intervention to organize producers into a cooperative may enable an intervention around accessing finance or technical training on agroforestry. In other cases, two interventions may require *co-implementation* for success – for example, an intervention to improve agricultural practices and increase yields may require co-implementation of an intervention to implement a park guard monitoring program in the adjacent protected area to ensure that agricultural production does not expand into the protected area. Participants should review the list of landscape interventions and their co-dependencies and identify key contributions.

Facilitation tip: Try to probe just a bit beyond the first answer in terms of enabling inputs and conditions. If someone suggests that funding is what enabled the success of an intervention, for example, was it an allocation from a public budget or a grant from an international foundation or something else? Where did it come from, and who made the decision to allocate it?
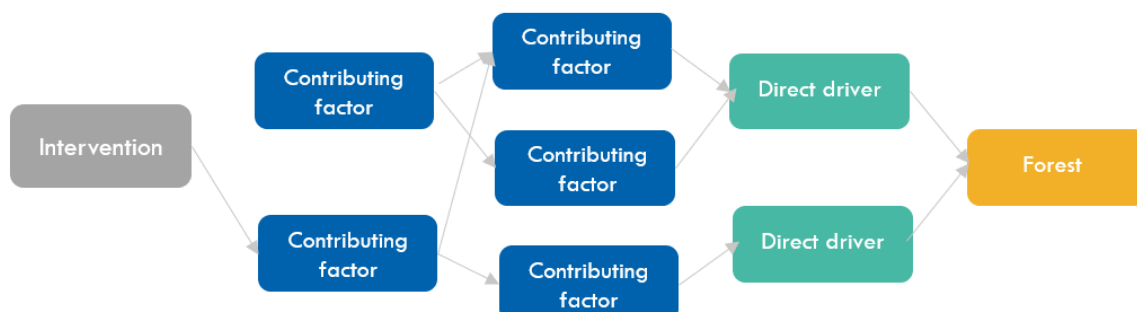
Appendix G: Assessing causality

Figure 10: Sample diagram showing a project's impact pathway linearly.

Following a classical results-based management (RBM) approach for development interventions, causality can be assessed at the following three levels:

- From outputs to outcomes – e.g., to assess our confidence in whether (and how) a lobbying effort has resulted in the adoption of a policy at the relevant jurisdictional level.

- Between outcomes – e.g., to assess our confidence in whether (and how) the legalization of the new policy has resulted in enforcement efforts at the relevant jurisdictional level.

- From outcomes to impact – e.g., to assess our confidence in whether (and how) the policy and/or enforcement efforts have helped to reduce deforestation in the target landscape or jurisdiction.

If the intervention's expected outcomes are already achieved (or very likely to be achieved – scenario A), we recommend the focus group to concentrate their attention on actual or expected causality between outcomes, and/or between outcomes and impact.

With uncertainty on whether the expected outcomes will be achieved (scenario B), the intervention focus group may want to concentrate their analysis on the expected causality between outputs and outcomes, and eventually consider identifying additional intermediary outcomes (with their relevant indicator/s) along the impact pathway which could be monitored throughout implementation (Appendix F may help).

Important note: the CALI has not been designed to *measure* the degree to which a quantifiable decrease in deforestation and/or increase in forest cover in a landscape can be attributed to one or more specific interventions. Departing from an *attribution* logic, this assessment aims to provide decision-makers with insights into whether and how an intervention (or set of them) might (have) *contribute(d)* to generate such changes.

Contribution Tracing

The suggested approach builds on the work of Befani and Stedman-Bryce (2017)[51], contextualizing their methodology for the assessment of interventions addressing deforestation at landscape or jurisdictional level.

INSIGHT 8: Contribution claims

Contribution claims transparently detail the hypothesized causal connection(s) between an intervention (or set of interventions) and one or more different levels of results (intermediary outcomes) along the impact pathway which is supposedly leading to contribute to reducing deforestation in a landscape or jurisdiction. For an accurate investigation of all causal links, such an impact pathway must be divided into all its necessary components or steps.

For example, a contribution claim may be phrased as "the legalization of policy X in jurisdiction Y was influenced by the Project intervention Z," with policy X as a key project outcome and addressing an important driver of deforestation in jurisdiction Y, and intervention Z being a Project intervention, such as an advocacy campaign. This could be part of a more comprehensive contribution claim covering the whole result chain, from output to impact, such as "the reduced rate of deforestation observed in area J of landscape/jurisdiction Y was influenced by the change in its driver K due to the legalization of policy X, which was in turn influenced by the Project intervention Z." If changes are observed at all levels, the CALI Project team will need to proceed with the assessment for each sub-component of the overall contribution claim. Not always a reduction in deforestation rate or in one of its key drivers will be observed, so the CALI Project team will need to carefully identify the relevant outcomes and causal links on which to focus the causality assessment.

To assess causality at the different levels discusses above, the facilitator of each intervention-focused working group should engage the participants in formulating contribution claims (see Insight 8) following the intervention's impact pathway. Then, to test the validity of the contribution claims, the group will need to identify observable evidence in support or against each contribution claim. This may result in iterations with the previous step, as the group may decide to re-focus the phrasing of their contribution claims as they discuss evidence. It is an important step, and discussions shall be carefully logged by the CALI facilitator: these preliminary conversations, indeed, allow to identify grey areas in the validity of impact pathways. These shall be logged carefully and will feed into step 2.4.

The role of the team member leading the working group is fundamental here: the assessment will only work if s/he knows what evidence to look for and understands its importance in relation to the claim under assessment. It is particularly important to distinguish between *absence of evidence* and *evidence of absence*. While the former can be overcome by further data collection, the latter means that the evidence that the CALI Project team would expect or love to see to prove causality is clearly not there. More detailed guidance on the kinds of evidence needed to validate or reject a contribution claim is available in Insight 9 below.

INSIGHT 9: Different types of Evidence

As anticipated, for each contribution claim identified in the previous step, the intervention-focused working groups should identify and categorize two types of evidence in support (or against) the contribution claim.

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[51] Befani, B. and Stedman-Bryce, G., 2017. Process tracing and Bayesian updating for impact evaluation. Evaluation, 23(1), pp.42-60.

- *Expect-to-see evidence* – these are observations we expect to make under the assumption that the contribution claim holds true; our confidence in the claim changes significantly only if – after having looked carefully – we fail to observe it (evidence of absence). Observing 'expect-to-see' evidence is known as 'passing the Hoop test': the contribution claim needs to 'jump through the hoop' if it is to be retained as a possibility. As such, it can be said that it has disconfirmatory but not confirmatory power. In this sense 'expect-to-see' evidence is necessary, but not sufficient to prove the contribution claim. It can be identified by answering the following two questions:

  1. What evidence do we expect to find if the contribution claim holds?

  2. What would prove, beyond reasonable doubt that the contributions claim does *not* hold?

Table 5: Description of evidence expected to be observed under the hypothesis that the contribution claim holds, in the case of an advocacy campaign for more sustainable land-use planning aimed to influence policymaking in a certain jurisdiction.

Example: Expect-to-see evidence, in the case of an advocacy campaign for more sustainable land-use planning	
Expectation One	At least partial congruence between the revised methodology for land-use allocation and the suggestions made by the campaign.
Expectation Two	The revision of the methodology to happen sometime AFTER the campaign published its report.
Expectation Three	The campaign and its report to have sufficient reach or to be targeted in a way that the District Government could have, at least potentially, access to the report.
Expectation Four	The majority of the stakeholders responsible for the campaign (who have an incentive to say it has been successful) believe in the contribution claim.

- *Love-to-see evidence* – the "dream" evidence; it is usually harder to find, but, if observed, has the power to confirm the contribution claim beyond reasonable doubt. Observing 'love-to-see' evidence is akin to 'passing the Smoking Gun test;' i.e., as if a murder suspect were to be caught with a smoking gun in their hand, in the vicinity of the victim. At the same time, failing to observe 'love-to-see' evidence does not weaken the contribution claim. In this sense 'love-to-see' evidence is sufficient, but not necessary, to prove the claim. This type of evidence can be identified by answering the following two inter-related questions:

  1. What evidence is *not* compatible with any other explanation or causal claim?

  2. What would prove, beyond reasonable doubt that contribution claim hold?

Love-to-see evidence include observations that greatly increase our confidence that the contribution claim does hold, as they would be rare under alternative circumstances. For example, (i) the admission of influence on behalf of the District Government in a public statement; and (ii) the District Government using exactly the same formula suggested in the report to revise its methodology.

Because it makes the groups proactively look for alternative and/or additional explanations for an outcome, contribution tracing has a high value to the understanding of the team around what they are undertaking.

Important note: It is critical to stress that even if the above approach helps to prove a specific contribution claim, it is very rare for outcomes to have one single cause. If the CALI Project team wants to account for other factors beyond the Project intervention, more complex contribution claims can be developed and tested using

the same method described above, through gradually incorporating and consolidating evidence found for each factor. Using the example of the comprehensive contribution claim mentioned in <mark>Insight 8</mark> above, it could be extended to say "the reduced rate of deforestation observed in area J of landscape/jurisdiction Y was influenced by the change in its driver K due to the legalization of policy X, which was in turn influenced by the Project intervention Z *and by the non-Project intervention W*." The validity of a contribution from non-Project intervention W should be then assessed as done for Project intervention Z. This can be done repeatedly and at all levels of outcomes, trickling down if needed.

All in all, as the quality of theory depends on the quality of evidence underpinning that theory, and the reasonableness of the hypotheses that we make where we lack evidence (assumptions), the causality assessment should help strengthening both, thus offering an opportunity for the Project team to increase the quality of their ToC. Newly gathered and assessed evidence about the validity of causal claims will help identify the stronger points in the ToC, while process notes from the causality assessment should help to identify grey areas, where further data collection is needed; what additional evidence/research would allow us to validate these untested assumptions in the ToC? Finally, the causality assessment should have also helped to identify what does not appear to be working, and why, and as such, offer an opportunity for the Project team to revise or upgrade their ToC accordingly.

List of Annexes

Annex 1: Stakeholder catalogue (template)

Annex 2: Interventions table (template)

Annex 3: Project dashboard (template)

Annex 4: Sample ToR for CALI lead facilitator (CALI LF)

Annex 5: Sample ToR for system mapping expert (CALI SM)

Annex 6: CALI implementation workplan (template)