



Food and Agriculture
Organization of the
United Nations

The Economics of Ecosystem Restoration (TEER)

Assessing benefits and costs
of Forest and Landscape Restoration

Report of the technical meeting

5-7 February 2019

FAO Headquarters, Rome
Canada room (A357)

Introduction

Forest and Landscape Restoration (FLR) has seen major increase in attention from countries and investors. One of the main assessments to understand and scale up restoration investments and implementation is to understand the cost/benefit of different interventions in different areas. Cost/Benefit analyses (CBA) has been a major tool in the FLR world and several publications and studies have been carried out that improved the understanding of costs/benefits (CB) for FLR. However, previous discussions among partners and review of literature have demonstrated that often specifics on these cost/benefits are absent and there is no one clear dataset to understand what different interventions in different circumstances could generate what monetary, socio-economic and/or ecosystem values. There is an urgent need to constitute a database/clearing house on CB of FLR to provide decision-making information and tools that donors, investors, project implementers, governments, and other stakeholders can use and consult for reliable cost and benefit data to inform their decision-making in Forest and Landscape Restoration (FLR). The aim of this technical meeting was to provide concrete answers to a set of strategic and practical questions that this endeavour raises, including the final product we want collectively, agreements/decisions on several critical technical issues, and a roadmap for collaborative activities in the near, medium and longer terms.

The aim of the present report is to provide a summary of the discussions that took place at the technical meeting, following the structure of the sessions presented in the agenda. After presenting a list of participants, it provides under each session:

- An introductory description of the rationale and aim of that session;
- A summary of the discussion and decisions taken.

Name	Title	Institution	Contact email
Daowei Zhang	Team leader CCR	FAO	Daowei.Zhang@fao.org
Douglas McGuire	FLRM Coordinator	FAO	Douglas.McGuire@fao.org
Moctar Sacande	AAD Coordinator	FAO	Moctar.Sacande@fao.org
Christophe Besacier	FLRM Forestry Officer	FAO	Christophe.Besacier@fao.org
Valentina Garavaglia	FLRM Consultant	FAO	Valentina.Garavaglia@fao.org
Blaise Bodin	FLRM Consultant/Forest Ecosystem Restoration Initiative (FERI)	CBD/FERI	Blaise.Bodin@fao.org
Christopher J. Kettle	Team Leader Forest Genetic Resources and Restoration	Biodiversity International	C.Kettle@cgiar.org
Elisabetta Gotor	Head, Development Impact Unit	Biodiversity International	e.gotor@cgiar.org
Danny Nef	Research fellow	Biodiversity International	danny.nef@gmail.com
Marta Kozicka	Associate Scientist	Biodiversity International	m.kozicka@cgiar.org
Bas Louman	Programme Coordinator	Tropenbos International	bas.louman@tropenbos.org
Vincent Gitz	Director, Programme on Forests, Trees and Agroforestry (FTA)	CIFOR/CGIAR	V.Gitz@cgiar.org
Alexandre Meybeck	Senior Technical Advisor	CIFOR/FTA	A.Meybeck@cgiar.org
Helen Ding	Environmental Economist	WRI	helen.ding@wri.org
Fred Stolle	Deputy Director, Forest Program	WRI	fred.stolle@wri.org
Victoria Gutierrez	Chief Science Office	Weforest	victoria.gutierrez@weforest.org
Nathalie Olsen	Senior economist	IUCN	Nathalie.Olsen@iucn.org
Sara Löfqvist	Research assistant	ETH Zurich	sara.loefqvist@usys.ethz.ch
Petri Lehtonen	Forest finance expert	FAO	petri.lehtonen@fao.org
Marco Boscolo	Forestry Officer	FAO	marco.boscolo@fao.org
Marc Parfondry	Consultant	FAO	marc.parfondry@fao.org
José Viliardo Díaz	Forestry Officer	FAO	jose.diazdiaz@fao.org

Session 1 - Review of relevant data and initiatives

Rationale. *This session set the scene presenting some initiatives already ongoing on the evaluation of costs and benefits of FLR. It discussed (1) the main barriers to cost-benefit analysis; (2) the main data gaps; (3) recent/future actions and projects in the Sahel region that could generate useful data for the pilot study.*

Key points from the discussion:

In terms of previous studies on this topic and data gaps:

- Previous initiatives that tried to review studies on costs and benefits of FLR include:
 - The World Forest Institute (WRI) assessed over 220 peer-reviewed articles/reports in a meta-analysis (<https://www.wri.org/sites/default/files/roots-of-prosperity.pdf>)
 - FAO assessed 45 project documents available online.

In both cases, the results are not usable for decision-making, as raw data on costs and benefits are sparse and incomparable due to the lack of standard frameworks to guide data collection. They provide a very wide range of values and not enough information on the actual intervention conducted.

- Some frameworks for collecting data, including on costs and benefits of FLR already exist (e.g. the Bonn Challenge Barometer, developed by IUCN, includes assessment of and reporting on the financial flows in support of FLR, and benefits accrued to biodiversity conservation, climate change mitigation and job creation from FLR) but they are quite flexible, not always comparable between countries and based on voluntary reporting from countries, within broadly defined indicators. The Barometer provides information on different types of financing for FLR in countries where it is applied and on benefits from FLR to biodiversity, carbon sequestration and short- and long-term jobs created. However, the methods used in different Bonn Challenge pledge contexts are not identical and there is varying level of data available, especially on all the costs associated with planning for and implementing FLR and on measuring the jobs created through this approach. Thus, there is a need for focused detailed information to fill gaps already identified, to make them comparable and to provide data that is detailed and consistent enough to conduct useful cost-benefit analysis.

In terms of the relevance and challenges to this initiative:

- There is a critical need for more detailed and differentiated (by area, timing, and returns (e.g. monetary vs. ecosystem)) information: some donors and investors will be reluctant to invest in restoration initiatives until they have better data and evaluation of the economic case for it.
- There is a tension between the complexity of FLR, for example related to the actors involved, to the spatial and temporal distribution of costs and benefits, as well as, to the uncertainties of outcomes, and the need for a simple enough, practical methodology to be used on the ground.
- There is a need to educate donors and investors about the unavoidable complexity reflected in the data about costs and benefits of FLR
- There is a need for a common approach to measuring FLR costs and benefits as currently data are not comparable at all. A common standard methodology and approach is deeply needed.
- The big “marginal” contribution of this initiative will lie in: 1) providing a solid and common framework for data collection on costs and benefits of FLR; 2) collecting real, documented, project-based data; 3) conducting various analyses based on these data

FAO proposed to use the Sahel region as the focus for the discussion over the three days of the meeting and for the piloting of the survey material to be developed.

- That proposal was accepted, noting that six institutions attending the meeting have projects in the Sahel that could provide data collection points to the study (CIFOR/FTA/CGIAR, FAO, IUCN, WeForest, and WRI, Bioversity).

Session 2 – Beyond a database: what product for what user?

Rationale: *The choice of data to be collected and the format of the database used to store it should be driven by its users for specific analysis and decision-making. This session discussed (1) the potential users of this database; (2) the information products (analyses and/or decision-making tools) that could be developed using consistent data on the costs and benefits of FLR; and (3) most importantly, the existing gaps in CBA of FLR and contributions of this exercise.*

Key points from the discussion:

What users?

- The target users would be mainly donors, private investors, governments (national and sub-national), and organizations implementing FLR projects. They all have comparable needs in terms of the nature and format of the data to be presented.
- Additional users (e.g. local communities, private investors, academia) could be targeted with specific products and analyses derived from the database at a later stage.
- Landowners / farmers are not considered as a major direct user here as they will most likely receive more targeted information prepared by project initiators for their specific situation.

What tools and analyses?

- Three main stages were identified in the development of a decision-support tool on the costs and benefits of FLR:
 - First a simple reference database that list the current studies that have been collected and papers that were reviewed. As mentioned in the previous session more than 250 projects/papers have already been reviewed, though often in unsatisfactory detail, to get this into a comprehensive list with link to the projects/papers is a first simple but important step.
 - Second, a simple interface would be developed to access average values (and mean deviation) on costs and/or benefits (focusing on monetary, biophysical benefits, market information and social benefits that are presented separately) of certain FLR interventions.
 - Third, all organisations will collect (existing or newly collected) new more precise data and consistently compiled in the database.
 - In a second phase, the database would allow users to conduct analyses such as CBA, compare the cost-effectiveness of different interventions, or produce a cost-abatement curve of a given intervention in a given context. Eventually, and provided enough fully spatially explicit data is collected, a spatial optimization tool could be developed. Such a tool would allow for and homogeneous and robust data collection and then for the analysis of optimal

combinations of restoration interventions within the landscape for a given budget at different points in time.

What tool?

Data collection

- Excel will be used in the initial phases of the project to collect and compile data
- Different data collection formats will be then applicable, but need to be better assessed, for the development of the database, data collection templates, user interface
- The user interface would eventually be an online portal, to be hosted on a dedicated domain.
- Special care should be taken in developing the questionnaire / template for that interface, including clear and proper guidance to project implementers/managers who will be invited to gather and then submit the data to the database managers.
- Most of the collection of data will be forward-looking, collected from current and future projects. Projects that have been completed in the last 2-3 years, with relevant information that could still be recovered, under the responsibility of the project manager, would be included as well.
- All data collected will be ex-post (i.e. actual cost data rather than budgetary estimates).

Data access and user interface

- How spatially explicit does the tool need to be? The user's query could be fully spatially explicit, giving the possibility to draw a polygon on a map, and could automatically generate several elements of information on the context, drawing on already existing spatial datasets (if the concerns on providing spatial data are solved and such data can be provided)
- That does not imply that all the variables in the database will be fully spatially explicit (they just need to relate to a polygon, e.g. administrative unit)

Session 3 – Costs and benefits of what? Defining restoration interventions and expected outcomes

Rationale: *The question of the types of costs and benefits to be considered in the study needs to be grounded in a common understanding of the concept of FLR, the specific interventions that are applied as part of it, and the outcomes that are expected from it (a description of the state of the area before and after at the end of the intervention). The definitions adopted should be operational enough to allow for the data to be categorized between different types of interventions in the landscape and specific enough to ensure that costs are being compared and averaged across comparable interventions implemented over comparable timeframes and that result in comparable outcomes.*

Key points from the discussion

The discussion during this session covered three main issues: (1) the definition of the different scales at which data is collected, (2) the variables on which data should be collected for the establishment of a baseline prior to the restoration intervention taking place, and (3) the typology of restoration interventions.

Each ecoregion/biome and other key characteristics (to account for the elements of context that are not biophysical but equally important) contains several unique “pathways” defined by three

key categories of variables that will be the foundation of the data collection and interface for the tool:

- Context and baseline
- FLR intervention
- Outcome

This will be particularly useful in situation when primary data is missing for a biome in the geographical area of interest, and analysts might need to “borrow” information of the costs and benefits of the same biome from other similar biophysical and social economic contexts where primary data were reported. This might refer to a benefit transfer method.

Scale of data collection

Four different scales should be considered:

1. *Intervention unit*: to record direct costs and all benefits (including public goods benefits)
2. *Project/programme*: to record indirect costs, including transaction costs which would be apportioned to observation/intervention unit based on the size of each observation/intervention unit; aggregating all of the intervention units under a project/programme, would, in theory, produce the project/programme-wide benefit
3. *Landscape*: to record part of the indirect (or local public goods) benefits (e.g. water quality improvement in the watershed or social benefits)
4. *Country/Global*: to record part of the indirect benefits (revenues/income, employment, pure public goods, like biodiversity, food and nutrition security, carbon *IF* those have not been internalized and given a market value at one of the lower scales).

The established criteria to define the *intervention unit* are:

- minimum size of 10 ha
- under a single type of FLR intervention (e.g. agroforestry, assisted natural regeneration, etc.)

characterized by reliable data being available, as certified/signed by the project manager.

Description of the context

Description of the baseline state of the area to be restored

- The tool will use existing typologies of Land use (LU) and Land cover (LC) – e.g. [FAO Land Cover Classification System](#) framework – to define the categories of LU/LC
- Characteristics and Indicators that could be used to describe the level of degradation include:
 - Soil productivity: possible dataset available, NDVI
 - Biomass productivity:
 - Carrying capacity of the land (livestock):
 - Ecological functions:
 - Former land use (as a rough but nevertheless very meaningful indicator)
- The data provider is free to choose which one(s) of these characteristics and indicators to use
- For each indicator, the data provider could indicate what is the change in a 10-year period prior to the start of the intervention. That information can be then compared with the time series of global datasets on these degradation indicators

- To reduce the amount of data to be reported, the data provider can report only on the indicator that the intervention is aiming to improve
- The treatment of baseline information should distinguish between three types of data collection point:
 - Past projects: projects that have been completed in the last 2-3 years, with relevant information that could still be recovered, would be included
 - Current projects: pre-filled baseline information will be possibly produced, based on their location and data derived from already existing global datasets, then verified by the data provider for validation
 - Future projects: as foreseen for current projects, it will be a pre-filled baseline information accompanied by guidelines on how to collect further data

Scope and typology of restoration interventions

- The scope of “restoration” for the purpose of this study encompasses a wide range of possible restoration interventions (e.g. agroforestry, land / water management techniques aiming at improving the productivity and resilience of the land resource base, etc.), as well as their interactions in the landscape. In the first stages of the study, costs and benefits will be assessed at the scale of specific interventions (e.g. Assisted Natural Regeneration, Plantation, Agroforestry).
- The following (not necessarily exhaustive) list of interventions in the Sahel, to be taken into account for costs and benefits estimation:
 - Interventions based on water harvesting techniques (100-400 mm /annum)
 - Zai + planting
 - Half-moon (mechanized or manual) + planting
 - Stony cords + planting
 - Agroforestry (>400mm/annum, 2-5 ha)
 - Woodlands enrichment planting (up to 10-20ha)
 - Assisted natural regeneration (>600mm)
 - (social) fencing/grazing exclusion + enrichment
- The template for data collection should allow for as much data as possible to be recorded beyond a set of minimum variables. *E.g.* detailed descriptions of the intervention (e.g. stakeholders involved in implementation, breakdown by gender). , level of genetic diversity of planting material).

Choices of intervention types

- It is assumed that the project manager will use the least cost approach to achieve the objectives of restoration (which could be multiple, including social benefits).

Session 4 – Scope and typology of restoration costs

Rationale: Restoration interventions imply several costs, some directly related to the intervention (labour costs, costs of inputs/materials) and some more indirectly (training costs, transaction costs such as for stakeholder consultation, or prior land tenure resolution). Some of these costs are fixed and others variable, with implications on the cost-effectiveness of

restoration interventions at different scales. Additional costs that should be considered are transaction costs, including overhead charges that a project implementing agency may take. This session aimed at determining to the extent possible, for each of the types of intervention listed in the previous session, the direct and indirect costs that should be recorded in the database, as well as the restoration actor(s) most likely to bear this cost.

Key points from the discussion

Three phases were identified for the collection of data on costs:

1. **Pre-establishment (or pre-implementation) costs** (costs occurring before the intervention starts), including project identification, feasibility study, stakeholder consultation, etc.
2. **Establishment/implementation costs** (costs occurring during the intervention period)
3. **Maintenance costs** (costs (re)occurring after the project is implemented)

Throughout these three phases, information on the following types of costs will be collected:

- Costs borne by the organization implementing the FLR intervention(s):
 - Indirect costs (e.g. mapping, training, consultation)
 - Direct costs, organized by the following categories:
 - labour
 - material and inputs
 - capital
- Costs borne by local actors
 - Additional direct costs as above if not provided by the organization implementing the project, including:
 - land (only covers the foregone income from previous land uses if lands are removed from production) unless covered by the organization implementing the intervention
 - In-kind contributions (labour, material, inputs, capital, time spent in consultations and other project activities), where those are not already compensated.

In addition, **project management and operational costs** should be recorded (costs that are not overheads and need to be accurately described to avoid misunderstanding and double counting). These include all or most of the transaction costs borne by the project as well (e.g., project managers spend time in organizing labour and put equipment /contractors to do work).

Participants noted that the framework should be clear with respect to the different categories of : direct costs, indirect costs, the latter categories including transaction costs. Also project implementation and operational costs can span the two categories of direct and indirect costs. Ultimately clear definitions should be established for all these categories.

Participants took note that frameworks already exist that could be used to refine this typology and the associated data collection template for costs.

It was also noted that the use of a specific common typology for data collection will not prevent further analyses to use different approaches. However, to do so, it is key that the information in the database be clearly labelled, so that cost data could, when needed, be re-categorized depending on the analysis and the needs. In the process of data collection, the emphasis should therefore be on collecting data as consistently as possible and at the finest level possible, using clearly understandable definitions and guidelines for reporting on different costs.

Session 5 – Data collection methodology for costs

Rationale: *Data on the costs of FLR has been collected in the past but in an inconsistent and fragmented manner. Through the establishment of a standard methodological framework, this study would aim to provide a common template for recording costs in current and future projects from all participating organizations. This session considered practical considerations around the development of such a framework, the way it will be applied to collect data on costs, how data will be stored and how it will be entered into a joint database.*

Key points from the discussion

- Data collection process (further details can be consulted in the roadmap in the Annex)
 - It will be done through an online survey with guided answers and boxes for additional comments
 - A first draft will be produced based on a review of already existing surveys and data collection frameworks/surveys
 - Specific questions related to the inclusion of species and genetic diversity in the design of the intervention should be added in consultation with Bioversity International.
 - The first draft will be reviewed by partners present at this technical meeting
 - The reviewed draft will be tested in a few projects and revised (piloting phase)
 - The final survey will be shared as widely as possible, keeping track of who is using it
- Management, access and data entry rules
 - Participants agreed that the database shall be hosted in FAO
 - The custodian of the database will consult an advisory group (to be defined) on any outstanding issues
 - Legal aspects on data sharing and copyright in the database will be explored
 - In the initial phase of the study the database will be accessible only to those organizations that contributed to its initial development
 - Eventually, contribution to the database would guarantee access to it to further organizations
 - Results of the analysis of the data collected will be used to reach out more data providers and, in a second phase, potential donors.

Session 6 and 7– Scope, typology of restoration benefits and data collection methodology

Rationale: *These sessions aimed to discuss and establish, for each of the FLR intervention types considered, a typology of the expected benefits, both in terms of private and public benefits, and for each of those, a description of the likely beneficiaries.*

Benefits, and especially public benefits, may be more difficult to estimate than costs and require the application of valuation methods that indirectly assign them a monetary value. Accuracy and ease of application of a variety of methodologies was discussed and those methodologies that should be recommended as part of the standardized framework for data collection were discussed. These sessions also considered the time and resource investment required from projects to apply such methodologies, the time scales at which these methodologies should be applied when certain benefits may only become available many years after implementation of the restoration intervention, and sources of reference values that may be used to bridge data gaps

Key points from the discussion

The analysis of FLR benefits presents the following challenges:

- Little primary data from the field is available, there is thus a risk of not meeting expectations.
- Lack of sufficient data and due to long time frame needed before impacts can be measured the correlations (or causality pathways) between FLR interventions and the resulting biophysical changes of ecosystem services and social benefits over time.
- Lack of monitoring system in place to track the improvement of social benefits (e.g. job creation, on- and off-farm incomes, health impacts, migration, etc.) for local communities resulting from the FLR interventions.
- Currently reported restoration benefits heavily rely on ecosystem service model projections based on limited primary data, which undermine the reliability of benefit estimates for investors and hence higher anticipated risks for restoration investment
- In many cases, assessment of benefits implies the use of some modelling (e.g. carbon, water benefits), to be done with the best possible primary data. The input data for the modelling and modelling equations information should be specified as part of the standard framework.
- Planning a monitoring process will help to improve data collection overtime, but variables (mostly biophysical ones) to be used must be easy to track in the field and data collected can be further used as input to model the economic benefits.
- Different types of interventions will provide multiple benefits, which may occur at different points in time. Project needs to develop guidelines to help define and quantify the co-benefits of restoration interventions for different stakeholders over time.

In an initial discussion the following types of benefits were distinguished for the purpose of the analysis of data collected:

- Marketable benefits/private goods
 - Wood products
 - Crops

- Animal husbandry
- Non-wood forest products
- Income/revenues – levels and volatility
- Public goods
 - Soil (fertility, soil erosion control)
 - Water (water quality, water provision, flood regulation)
 - Biodiversity
 - Sink and storage of CO₂
- Social benefits
 - Job creation,
 - Farm income
 - Health impacts
 - Migration
 - Food and nutrition security

However, as is the case for costs, categories of benefits are established for the purpose of data collection each with clear metric, indicators and data collection protocols. Again, several phases can be distinguished during which data on benefits can be collected in different ways.

Each category of benefits requires:

- the establishment of standard metrics and methodologies for their measurement
- the establishment of a standard methodology (or range of possible methodologies) for their economic valuation, where feasible

The following phases were discussed in relation to data collection and modelling on benefits, but will be better defined while developing the template:

- **Baseline** (prior to the start of the project/programme/restoration intervention). For new projects, guidelines should be developed to ensure that baseline on the economic, social and environmental benefits of the area is collected prior to the intervention. Past projects to be included in the database on benefits should meet a minimum standard of information on the baseline benefits.
- **Implementation period** – the period during which the restoration project/programme or policy is being actively implemented over the area. For current and future projects, indicators for selected social, economic and environmental benefits would be monitored (allowing for a yearly report, if the project allows) during this period, using agreed protocols and survey templates. The survey would aim to quantify the benefits obtained and prices applicable, where possible, rather than apply valuation methods directly. For some of the social and environmental benefits, only qualitative information would be collected.
- **Post-implementation monitoring period** – In future projects, an agreement may be reached with the implementing partner on the ground to continue monitoring a set of agreed indicators over a number of years.
- **Benefits accrual period** – FLR takes place over long timeframes and the benefits of it should be measured accordingly. A period of 35 years could be considered to estimate the benefits expected for the intervention and compare them to the costs accrued. Since it is not practical nor feasible to collect data from the ground over such a long time, benefits would have to be modelled into the future, for each year past the implementation

period until a 35-year horizon is reached, using agreed standards methodologies. Data from the implementation and post-implementation period could be used to calibrate the projection of expected benefits.

A table is presented in Annex I with further detail on the list of benefits and corresponding metrics and methodologies for data collection in different phases. This framework will need to be completed prior to the development of data collection templates on benefits.

Session 8– Roadmap development and resource mobilization

Rationale: *The session discussed the allocation of tasks among partners and possible working groups to be established, discussing the financial model for 2019 and beyond, schedule of next meetings and outputs.*

Key points from the discussion

FAO will coordinate the overall study, supported by different groups of experts:

- *Review committee for the elaboration of the structure of the database.* It comprises the experts involved in this workshop and responsible to review and provide comments on the first draft of the surveys for data collection on costs and benefits
- *Custodian of the database:* responsible for management of the database and the quality of the data provided through the surveys. It will revise the information sent from the data providers and be responsible to contact the data providers in case additional information or clarification will be needed concerning the data. It will inform the advisory group about any outstanding issues.
- *Advisory group:* comprised of 4 or 5 individuals from partner institutions and responsible for providing advice to the custodian in case of any outstanding issue, including with regards to data entry and quality assessment

The work packages that were established during the technical meeting are the following:

- Template development for data collection on the intervention and costs
- Template development for data collection on the context/baseline
- Template development for data collection on the benefits
- Piloting of data collection
- Carbon assessment methodology in the Sahel
- Database development and management
- Tool interface conception and development
- Outreach to partners - mainstreaming of framework and methodology
- Fundraising

More details on specific tasks under each work package are reported in the roadmap in Annex II. Each work package and corresponding tasks will be led by a designated partner, and supported by contribution from others, as listed. The list of contributors is still incomplete and will be modified according to the availability of partners, with the role and tasks that they are leading on.

Annex II provides very crude estimates of the resources needed under each work package, within the overall envelope of about 500 000 USD that was estimated for the next two years of the study. A consolidated overview of the budget will be needed, providing details on how the different partners will plan to financially contribute and share the costs of developing the study.

Annex I – indicative table of benefits and corresponding metrics and methodologies for data collection in different phases

	Type of benefits (economic)	Unit and indicator	Valuation Method	Type of benefit (social)	Unit and indicator	Valuation method	Type of benefit (ecological)	Unit	Valuation Method
Baseline (year 0 and where possible mean of past 5 year)	Wood products	Cubic meter	Yearly values for qty and price	Employment	N/A (Qualitative)	Description of employment situation and trends in the community	CO2 sequestration	TCO2e	Biomass estimates based on RS
	Crops	Weight	Yearly values for qty and price	Cultural services	N/A (Qualitative)	Description of the services and their importance	Biodiversity	Flora Species div	Surveys; transects
	NTFPs	Weight	Yearly values for qty and price				Water benefits	Erosion control; Water quality; Water availability	?
Implementation period (year 1-5)	Wood products	Cubic meter	Yearly survey of qty and price	Employment	Nr work hours/year Nr people	Yearly survey of qty and price	CO2 sequestration	TCO2e	As reported by manager based on meth. Reco.
	Crops	Weight	Yearly values for qty and price	Cultural services	N/A (Qualitative)	Description of the services and their importance	Biodiversity	Direction of change in Fauna div. & abund (Pos, Neg, or neutral)	Survey conducted by project manager following guidelines
	NTFPs	Weight	Yearly values for qty and price	Distribution of benefits	% households Involved; % households benefitting; % women	Survey conducted by project manager following guidelines	Water	Erosion control	?

Post-project monitoring period?	Ibid, to the extent possible			Ibid, to the extent possible			Ibid, to the extent possible		
Modelling of benefits over the overall timeframe for restoration to be achieved	Wood products	Cubic meter	Projection based on established growth rate adjusted to actual rates during the project observation period	Employment	Nr work hours/year	Projection?	CO2 sequestration	T CO2e	Projection based on established growth rate adjusted to actual rates during the project observation period
	Crops	Weight	Projection based on agreed methodology	Cultural services	N/A (Qualitative)	Description of the expected changes in those services and their importance under a restored scenario	Biodiv	Fauna	Index based on RedList
	NTFPs	Weight	Projection based on agreed methodology				Water	Estimate of change in 5, 10 years	

Annex II – indicative roadmap

	Work packages and items	Notes	Lead partner/focal point	Contributors	Resource needs (estimated at 500k US\$)	Start date	End date
1.0	Template development for data collection on the intervention and costs		FAO/FERI	IUCN, CIFOR, Bioversity, Tropenbos, WRI, WeForest	25 000	15-mar-19	31-ago-19
1.1	Review of previous frameworks/surveys		FAO/FERI	FAO to request any relevant materials from partners		20-feb-19	15-mar-19
1.2	Development of draft survey (word doc)	– inclusive of guidance on the methodologies and how to answer the questions - Break down into smaller work streams	FAO/FERI	Others as relevant (FAO to contact partners with invitation to develop specific sections)		15-mar-19	15-mag-19
1.3	Collect feedback on survey from the review committee and integrate		FAO/FERI	--		15-mag-19	15-giu-19
1.4	Collect feedback on survey from the wider group and integrate		FAO/FERI	--		15-giu-19	15-lug-19
1.5	Pre-test based on project data		FAO/FERI	WeForest in particular have proposed using their data		15-lug-19	30-set-19
2.0	Template development for data collection on the context/baseline		CIFOR (FTA)	FAO, FERI, WRI, WeForest	25 000	15-mar-19	31-ago-19
2.1	Review of remote sensing datasets that could be used to characterize the site based on its coordinates						
2.2	Development of questionnaire sections with regards to the context/baseline						
3.0	Template development for data collection on the benefits		(WRI - tbc)	CIFOR, FAO, FERI, Tropenbos, IUCN, WeForest	25 000	15-mar-19	31-ago-19
3.1	Review of previous frameworks/surveys			WeForest (SocioEconomic)			

3.2	Development of draft survey (word doc)	– inclusive of guidance on the methodologies and how to answer the questions - Break down into smaller work streams					
3.3	Collect feedback on survey from the review committee and integrate						
3.4	Collect feedback on survey from the wider group and integrate						
3.5	Pre-test based on project data						
4.0	Piloting of data collection	Over at least 10 projects and 50 observation units	All institutions with projects	All institutions with projects	125 000	01-set-19	31-dic-19
4.1	Draw up list of collection data points (projects and observation units)	All participating organizations to send information on projects and contact points	FAO/FERI	All participating orgs			
4.2	Review of overall questionnaire based on the collection of various modules for consistency, length and quality		FAO/FERI	Review committee			
4.3	Develop online version of the questionnaire (in French)		FAO/FERI	N/A			
4.4	Dissemination in pilot projects (including training of data collection focal points)		N/A	All participating orgs			
4.5	analysis of data from pilot collection and feedback of the questionnaire		N/A	All participating orgs			
4.6	Review and changes to the questionnaire based on data analysis and feedback received		FAO/FERI	Review committee			
5.0	Thematic work packages			CIFOR,	50 000	01-ago-19	31-ott-19
	Development of a proposal for a dedicated methodology for the assessment of carbon benefits of restoration in the Sahel		CIFOR	FAO (AGA), FAO (UN-REDD)	20 000		
	Others	Bioversity International					
6.0	Database development and management		? (tbd)		25 000	01-gen-20	01-mar-20

6.1	Develop database with all fields necessary for data entry from collection forms						
6.2	List of collection data points (projects and observation units)						
6.3	Explore potential legal issues around data collection, certification and sharing		FAO (Daowei Zhang)				
7.0	Tool interface conception and development		(WRI - tbc)		125 000	01-apr-20	01-ago-20
8.0	Share the summary of the expert meeting and roadmap – with an invitation to join and a concept note	for potential extension into other regions for data collection points in Sahel	FAO				
8.0	Outreach to partners - mainstreaming of framework and methodology and fundraising				100 000	01-ott-19	01-mar-21
8.1	Get buy-in from stakeholders through networks and events such as AFR100, 20x20, GLF, CPF, GPFLR	AFR100 Beating Famine conference 25 February 2019 (Sahel-related); GLF Kyoto May 2019; UNFF 14 May 2019; GLF Bonn June 2019; WFC Curitiba Sept 2019					
8.2	Outreach to donors – (e.g. BMU, GEF, NICFI...)			Development of a schedule to contact donors based on their own calendars Corporates – Anniversary of the NY Declaration in Brussels, 23 September 2019			
9.1	Short term fundraising						
Total amount					500 000		