



“Developing a methodology for a Cost-Benefit Analysis of prevention vs. mitigation of wildfires in the tropics”

Terms of Reference

June 2024

Introduction

Background

Tropenbos International is currently implementing the [Working Landscapes Program](#). Promoting climate-smart landscapes will contribute to climate change mitigation, adaptation, improved livelihoods, and environmental integrity, which are crucial to achieving the Paris Agreement and the Sustainable Development Goals (SDGs). Forests and trees in well-managed landscapes have the potential to contribute significantly to climate change mitigation and adaptation while supporting people’s livelihoods and sustaining agricultural value chains.

Fire use and wildfires are a risk in fire-sensitive ecosystems, including forests, and shape vegetation traits and landscapes. Wildfires impact ecosystems and trigger impacts on human, natural and social levels.

The application of fire in land use and land-use change, as well as wildfires, have been big issues in various parts of the tropics, with complex underlying causes and exacerbating factors. The use of fires has long been linked to traditional practices by indigenous communities. The current excessive application of fire in land-use change and resulting wildfires, however, are often a direct effect of modern agricultural development. Considering the urgency of handling fires in the tropics Tropenbos International, as part of the Working Landscapes Program, implemented the [Fire-Smart Landscapes Governance Programme](#) (FSLGP) in Bolivia, Ethiopia, Ghana, Indonesia, and Uganda.

The **long-term vision** of the project is one of climate-smart landscapes where forest and trees are used sustainably, and the risks of catastrophic wildfires are reduced. Stakeholders manage land use and fire to reach jointly agreed objectives, taking the needs and interests of women, men and youth into account and supporting mitigation and adaptation goals. The main strategies to contribute to the vision is adoption of integrated approaches involving improved governance and management, landscape approach or fire-smart territory.

The prevention approach on which the FSLGP is based is based on 4 components:

Collaborative governance: To promote and develop an inclusive and shared decision-making system based on principles of partnership, equity and accountability are required to make decisions about the reduction of the risk of wildfires.

Collaborative Learning: that involves i) Understand the fire problem and its characteristics; ii) Anticipate what can happen by interpreting how the wildfire physical properties and fire behavior can affect individuals and interact within the area; and, iii) understand what needs to be done to decrease the wildfire hazard and vulnerability and increase the capacity to respond when hazardous events occur.

Empowered communities: Improving capacities of communities, taken youth and women into account to make decisions, apply practices, think about the results and adapt new methodologies is required. The FSLGP approach demands, and it's based, in the empowerment of local communities.

Improved policies and practices: That support the management of the risk of wildfires are required, the development of such policies and practices should aim to create a better balance between prevention and mitigation of wildfires.

The actions and activities developed within the framework of these 4 components should have a direct impact on forest fire risk prevention. We understand "prevention" as a combination of measures and actions taken in advance in order to prevent new risks or impede their development and strengthening. In this sense, under our approach, prevention actions are related to the 4 components described above and, although they form a broader part of actions. Therefore, emphasis is on creating enabling conditions and building capacity to reduce wildfire risk and not on physical prevention actions (e.g. fire barriers, construction of firefighting infrastructure, major firefighting equipment and others of this type), although the programme likely plays a role in ensuring the systems are in place to create this.

Rationale

In disaster risk management there is an underlying assumption that the costs of preventing any type of disaster are lower than the costs of mitigation and recovery. There are studies available for estimating climatic risks for which this assumption holds. However, in the case of forest and landscape fires there is limited availability of information on costs and benefits of wildfire prevention versus mitigation and recovery of wildfires. Key difficulties in the context of disaster risk reduction (DRR) are related to measuring risk and estimating avoided or reduced risks due to interventions, and associated costs and benefits.

Cost-benefit Analysis (CBA) is a major decision-supporting tool used by governments and other institutions to organize and calculate the societal costs and benefits, inherent trade-offs, and economic efficiency of public policy, programme or project. CBA has been widely used for many purposes and applications. In a CBA, costs and benefits are compared under a common economic efficiency criterion in order to derive a decision, for which in theory, all effects, costs and benefits, need to be monetized and aggregated.

Most nations do not have any cost/ benefit assessment on fire prevention versus fire response. A UNEP report¹ stated that more than half the expenditures related to wildfires are for response, while prevention typically receives just 0.2 per cent of the total budget for wildfires.

1 United Nations Environment Programme (2022). Spreading like Wildfire – The Rising Threat of Extraordinary Landscape Fires. A UNEP Rapid Response Assessment. Nairobi.

Economic analysis including CBA has been applied to assessing disaster risk reduction, and there is a specialized literature, including manuals, on using CBA and other appraisal methods in the context of natural disaster risk².

From approach to methodology

For the Fire Smart Landscape Governance Programme we adopted a landscape approach for fire management. However, this "Approach" is a generalized concept; an overall style or idea that one adopts to overcome a problem or face a given situation. An approach remains at the level of an idea and does not involve steps that are time tested or empirically proven.

The intended series of actions (activities) in any given situation sum up the approach. So, the way a thing or a situation is handled is called the approach and it varies all the time with different situations and different individuals. There isn't necessarily a formula with slight variations that can be measured in case of an approach. For example, a player's approach to golf can mimic the style of play of another great player to be described as the similar approach to golf.

Taking it a step further, a "methodology" refers to structured procedures that have been tested over time and again and proven to help overcome problems or issues. It is a well-organized and researched plan with specific components such as phases, activities, tasks, techniques, tools and deliverables to help address a problem or an issue. A methodology is scientific in nature and can be executed in a series of small steps (activities) with the ability to be customized according to the requirements of a particular situation. Ideally the methodology is actually doing what you intend in the approach, but if you are not careful, the two things may not be the same.

Scope of work, tasks and responsibilities

Objectives

The objective of the consultancy is to develop a methodology for a C/B Analysis of wildfire prevention - following the TBI approach for fire management- vs. mitigation.

Once developed, this methodology will be used for CBA in the five landscapes in Indonesia, Bolivia, Uganda, Ghana and Ethiopia. Conducting the study itself is not part of this assignment, this assignment is about developing the methodology.

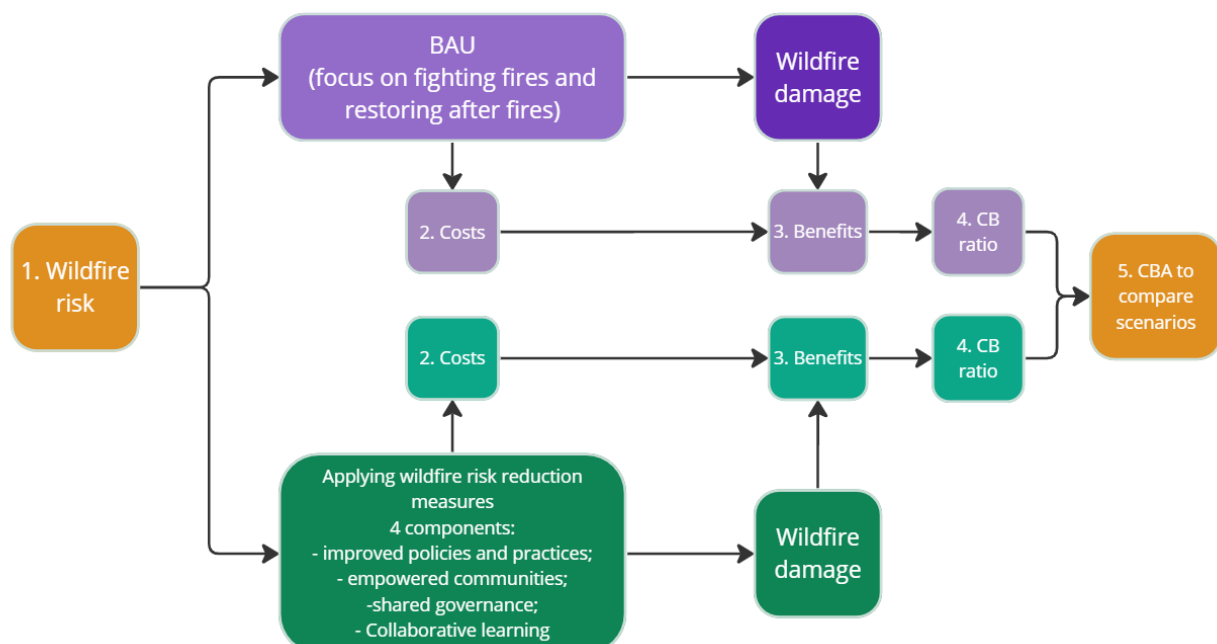
Scope

The consultant is expected to develop a methodology for C/B analysis collaboratively with the five countries involved in the programme and the secretariat.

² Benson C, Twigg J (2004) Measuring mitigation: methodologies for assessing natural hazard risks and the net benefits of mitigation—a scoping study. International Federation of Red Cross and Red Crescent Societies (IFRC); ProVention Consortium, Geneva; Benson C, Twigg J (2007) Tools for mainstreaming disaster risk reduction: guidance notes for development organisations. International Federation of Red Cross and Red Crescent Societies/the ProVention Consortium, ProVention Consortium Secretariat, Geneva; WMO-World Meteorological Organization (2015) Valuing weather and climate: economic assessment of meteorological and hydrological services. WMO, Geneva

Focus of the methodology should be the four components on the TBI approach for fire management. following elements should be considered for developing a method for conducting CBA for wildfire prevention versus mitigation (following Mechler 2005³):

1. Method for a wildfire risk analysis, without preventative measures, including estimating and combining hazard(s), exposure and vulnerability to an estimate of wildfire risk occurrence.
2. Identification of wildfire risk prevention measures and associated costs in the framework of the 4 components that were described as part of the FSLGP. The list of the different alternatives already developed by the partners in the countries (again within the 4 components) should be identified and the costs assessed.
3. Method for assessing the impact of wildfire risk reduction measures, reduction of wildfire risk. As disaster risk is a downside risk, benefits are the risks avoided. The core benefits generated by investments in wildfire risk reduction are reductions in future impacts and losses.
4. Calculation of the net present value and the benefit-cost ratio, combining wildfire risk scenarios, and contrasting wildfire prevention versus mitigation and recovery of wildfires to determine economic efficiency. The set or group of prevention activities will be agreed between the five countries in order to avoid a long list of possibilities.
5. Finally, economic efficiency is assessed by comparing benefits and costs using different metrics.
6. Identification and qualitative valuation of benefits and costs.
7. Quantitative assessment and valuation of costs and benefits, including direct, indirect and/or intangibles categories.
8. Possibility: during the development of the methodology, use one country to pilot to ensure the method works?



The consultant should provide the methodology based on information that the countries can provide during 2024 or information that the countries already have and should take into account the information that is

³ Mechler R (2005) Cost–benefit analysis of natural disaster risk management in developing countries. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). Arbeitskonzept, Eschborn

available in the 5 countries. The methodology should consider whether it is feasible to perform a quantitative assessment or whether, on the contrary, given the availability or feasibility of accessing information, a qualitative analysis can be performed.

Expected outputs and deliverables

Throughout the consultancy period the consultant is expected to deliver:

- 1) First month: A proposal for the set-up of the process including fine tuning this ToR, proposed research questions, preliminary idea of the methodology and initial data needed. TBI team will organise inception meetings with the consultant to give all the information and clarify the scope of the FSGLP. This proposal should include some key choices for the analysis.
- 2) At the end of the consultancy:
 - a. A methodology to analyse the cost-benefit ratio of prevention vs. mitigation, including literature and interview findings.
 - b. A list of the necessary data for the CBA to be collected during 2024 or existing data in the different countries.
 - c. A set of recommendations to carry out the study.

Proposed activities

- Meetings with TBI team members to fine-tune the objective and outcome of the consultancy.
- Quick scan of literature review of B/C of prevention vs. mitigation methodologies.
- Interviews with the TBI partners in each country to get a good understanding on:
 - Country specific activities carried out on wildfire prevention.
 - Country specific data or information existent or that can be gathered during 2024.
- Presentation to the team and countries of the methodology and information needs to collect additional input.
- Presentation of final report.

Expertise required

For the above objectives, TBI is looking for a qualified researcher with a background in economy or financial engineering to conduct the study. Potential candidates are with the following criteria:

- Proven experience in conducting cost-benefit studies.
- Familiarity with the topics of forest fires, and wildfires in the tropics.
- Demonstrated English writing skills through a good track record of publications on topics or issues in the tropical countries.
- The researcher is expected to have access to libraries and literature

Individuals employed at an organisation are eligible as long as there is consent and approval for this consultancy including to produce publication under TBI name and are available during the contract period.

Timeline/workplan

The successful candidate will be contracted by TBI for the duration of July to September with a total of 30 working days.

Inputs

During the contracting period, TBI will:

- Provide secretarial and logistical support (in consultation and within reason), including relevant contacts
- Keep consultant informed of all activities and documents relevant to the performance of his/her duties.

Throughout the assignment, there will be close working relation with the Thematic Coordination Team composed of Rosalien Jezeer and Humberto Gómez.

Procedure

We seek to receive the following information from the candidate:

1. A brief proposal and planning of the assignment, including the delivery of the products;
2. Budget
3. CV

Awarding

The contract will be awarded to the “most advantageous tender” using the following criteria:

- Quality of the proposal
- Competence of the candidate
- Price

Tropenbos International reserves the right to cancel the procurement procedure, without candidates being entitled to claim any compensation. Publication of this procurement notice does not commit Tropenbos International to implement the programme or project announced.

Deadline and contact details

Proposals from candidates should be submitted by Friday, 21 June 2024 EOD CEST, for the attention of Humberto Gómez (humberto.gomez@tropenbos.org).

The successful applicant will be notified before 28 June 2024.