



## “Key factors to reduce vulnerability to fires in the tropics”

### Terms of Reference

October 2022

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## Introduction

### Background

Tropenbos International is currently implementing the [Working Landscapes Programme](#). By promoting climate-smart landscapes, we 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.

Application of fires in land use and land-use change 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. Current excessive application of fire in land-use change and the resulting fire hazards, however, are often as direct effects of modern agricultural development. Considering the urgency of handling fires in the tropics, Tropenbos International as part of the Working Landscapes Programme, is implementing the project [Fire-smart landscape governance](#) 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 fires 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 and/or fire-smart territory.

### Rationale

Fire research is required to prevent damage due to direct and indirect consequences of fires, which can be loss of lives, threat to human health and safety (through smoke pollution and secondary disaster resulting from extremely severe wildfires), property damage, people relocation, and loss of local revenue. Fire hazards bring consequences in health, economic and environmental aspects. Local communities and their livelihoods in the surrounding areas might be the most vulnerable to the risk of fires. Major factors are their lack of

capacities in addressing hazards or finding alternatives to the use fires that do not harm the landscape and the environment. A wider population is also impacted by fire-generated smoke pollution during the extensive fire incidence, including the impacts of fire emissions / smoke pollution and contributions to GHG emissions beyond the national boundaries.

Ecosystem's or landscape's susceptibility to fires also contributes to the vulnerability of the communities or the population in the areas. There is a need for understanding the ecological processes and other variables that determine or contribute to the susceptibility, which may include other factors such as anthropogenic as well as climate factors.

Understanding the different factors, as well as aspects related to adaptive capacities of the communities or landscape actors are key towards reducing the risk of fires and wildfires and managing the ecosystems to eliminate or reduce fire occurrence. Such improved understanding and knowledge will be beneficial as lessons learnt for practitioners, recommendation to decision makers and capacity strengthening and facilitation for communities.

## Objectives and scope of work

### Objectives

The **objective** of the study is to identify and review key factors that affect vulnerability of local communities to land-use fires and wildfires in the tropics. This may cover all or partly relevant elements of vulnerabilities, such as exposure, susceptibility and adaptive capacity. The output of the study is expected to contribute to the project's efforts on establishing fire-smart governance and reducing the risk of wildfires in the tropics.

### Definitions

For the purpose of the study, we adopt the following definitions<sup>1</sup>:

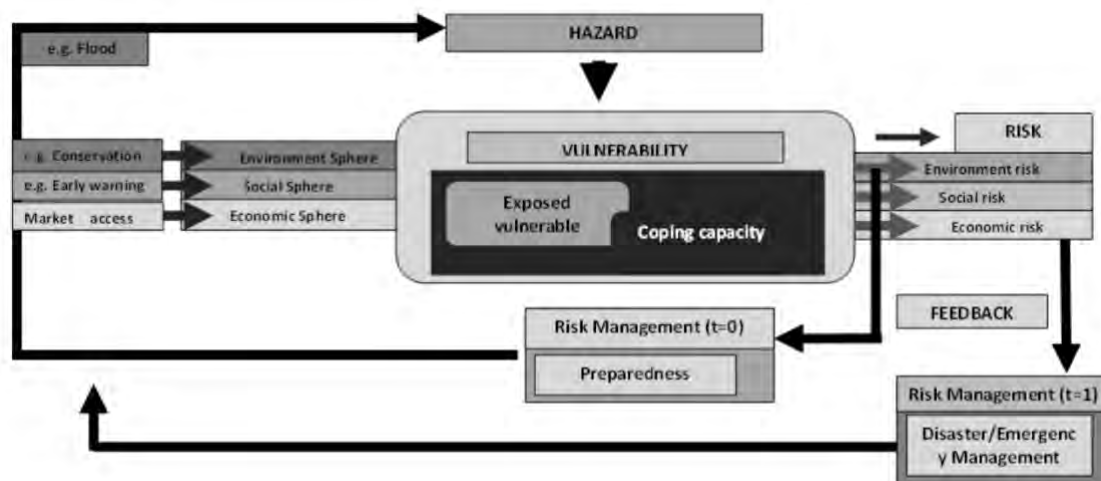
**Exposure** is defined as "the situation of people, infrastructure, housing, production capacities and other tangible human assets located in hazard-prone areas". As stated in the UNDRR glossary, "measures of exposure can include the number of people or types of assets in an area. These can be combined with the specific vulnerability and capacity of the exposed elements to any particular hazard to estimate the quantitative risks associated with that hazard in the area of interest". **Vulnerability** is defined as "the conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards". Vulnerability is multi-dimensional in its nature, and next to the four factors above, some authors also include cultural and institutional factors. Examples include, but are not limited to, poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, high levels of poverty and education, limited official recognition of risks and preparedness measures, disregard for wise environmental management or weak institutions, and governance (e.g. including corruption etc.). Under IPCC definition, vulnerability covers a variety of concepts and elements, including sensitivity or susceptibility to harm and lack of capacity to cope and adapt (IPCC, 2014).

There is no consensus on the definition of vulnerability, and therefore, there is no single accepted method of assessing vulnerability. Another definition describes it as 'the capacity of society and individuals exposed to a natural hazard, to be harmed, resist, cope with, or recover from impact'. One of the references that can be

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<sup>1</sup> <https://www.undrr.org/terminology>

adopted for the study is the Bogardi-Birkmann-Cardona (BBC) model (Bogardi and Birkmann, 2004) (see figure below) that allows us to examine the three components of vulnerability: exposure, susceptibility and adaptive/capacity. The framework also combines hazard and vulnerability in risk reduction perspectives.



## Scope of the study

There is a large number of studies that have documented fire hazards in the tropics. The publications may be in the form of peer-reviewed scientific journal publications, as well as grey literature in the form of technical documentation, conference proceedings, academic papers and the like, and all this type of information is the basis of the review. The review (literature review or systematic review) should be conducted on the available publications in the areas of vulnerability to fires in the tropics and other relevant topics.

The review may include interviews with key informants who are in position to enrich the literature review based on their own experience. These key informants are expected to have had working experience in tropical regions of South America, Africa and/or Asia. The list of key informants and the interview questionnaire will be first agreed upon with the project team in advance.

The geographic coverage of the studies being reviewed must be in tropical countries. When feasible, these should include countries where the TBI Fire Smart Landscape Governance project is implemented (i.e. Bolivia, Ghana, Indonesia, Uganda and Ethiopia).

## Expected outputs and deliverables

The consultant is expected to produce syntheses and lessons learnt based on the reviews and the interviews and provide recommendations for the purpose of reducing the vulnerability to fires in the tropical regions. The final publication will be an Info Brief to be published by TBI.

Specifically, throughout the study period the consultant is expected to deliver:

- 1) At the start: A proposal for the set-up of the study as an interpretation of this ToR, which includes specific objectives, if applicable, proposed methodology and draft interview questions.
- 2) At the end of the study period:
  - a. A database of literatures, both peer-reviewed and grey
  - b. A database of the interviews made
  - c. A synthesis report

- d. An Info Brief to be published by TBI and made available through TBI website and social media

Towards the completion, the consultant is expected to conduct a workshop (online) with the project team for discussions and internalisation of the results for the benefits of the ongoing project.

## Expertise required

For the above objectives, TBI is looking for a qualified researcher/consultant to conduct the study. The potential candidates are with the following criteria:

- Familiar with the topics of fires in the tropics and vulnerability to hazards, disasters or climate change
- Demonstrated English writing skills through a good track record of publications on topics or issues in the tropical countries
- Experience of literature or systematic reviews into written publication is a plus
- 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 available during the contract period.

## Timeline/workplan

Successful candidate will be contracted by TBI in the duration of November –December 2022, with the total of 20 working days.

## Inputs

During the contracting period, TBI will:

- Provide reasonable secretarial and logistical support (in consultation), including relevant contacts
- Keep consultant informed of all activities and documents relevant to the performance of their duties.

Throughout the assignment, there will be close working relation with the Project Coordination Team composed of Rosalien Jezeer and Atiek Widayati.

## Procedure

We seek to receive the following information from the candidates:

1. A brief proposal and planning of the assignment, including the delivery of report and Info Brief;
2. Itemized budget;
3. Curriculum Vitae

## Awarding

The contract will be awarded to the “economically most advantageous tender”. Criteria to be applied are:

- 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, 4 November 2022 EOD CEST for the attention of Atiek Widayati (atiekwidayati@tropenbos-indonesia.org).

The successful applicant will be notified before 15 November 2022.

## References

Bogardi, J., & Birkmann, J. (2004). Vulnerability assessment: the first step towards sustainable risk reduction. *Disaster and Society—From Hazard Assessment to Risk Reduction*, Logos Verlag Berlin, Berlin, 1, 75-82.

**IPCC**, 2014: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.