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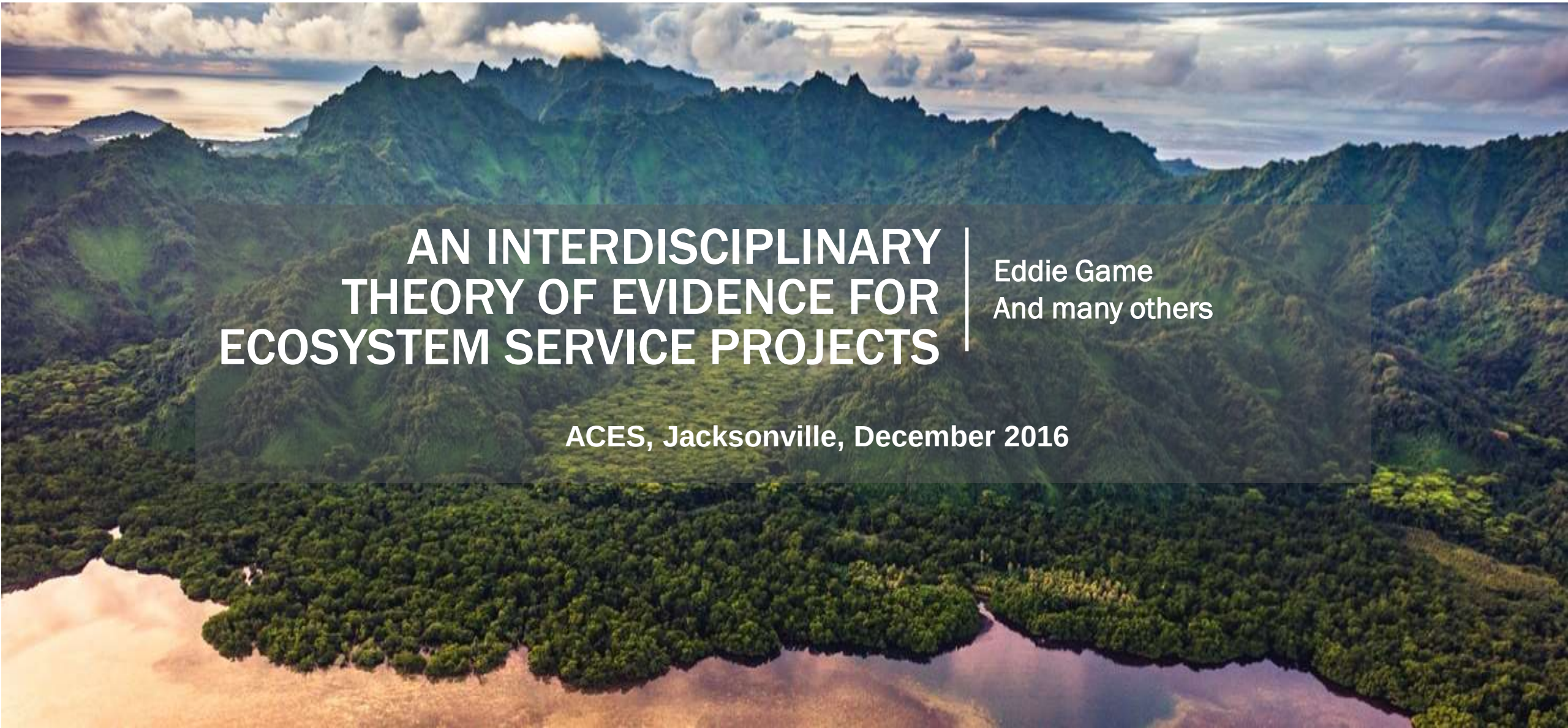

AN INTERDISCIPLINARY THEORY OF EVIDENCE FOR ECOSYSTEM SERVICE PROJECTS

Eddie Game
And many others

ACES, Jacksonville, December 2016

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“We would also point out that genetic data is scientific data, i.e., evidence. This is a very different category to economics, social justice, or psychology.”

From an appeal on a decision at
Conservation Letters

Kampar Peninsula, Sumatra

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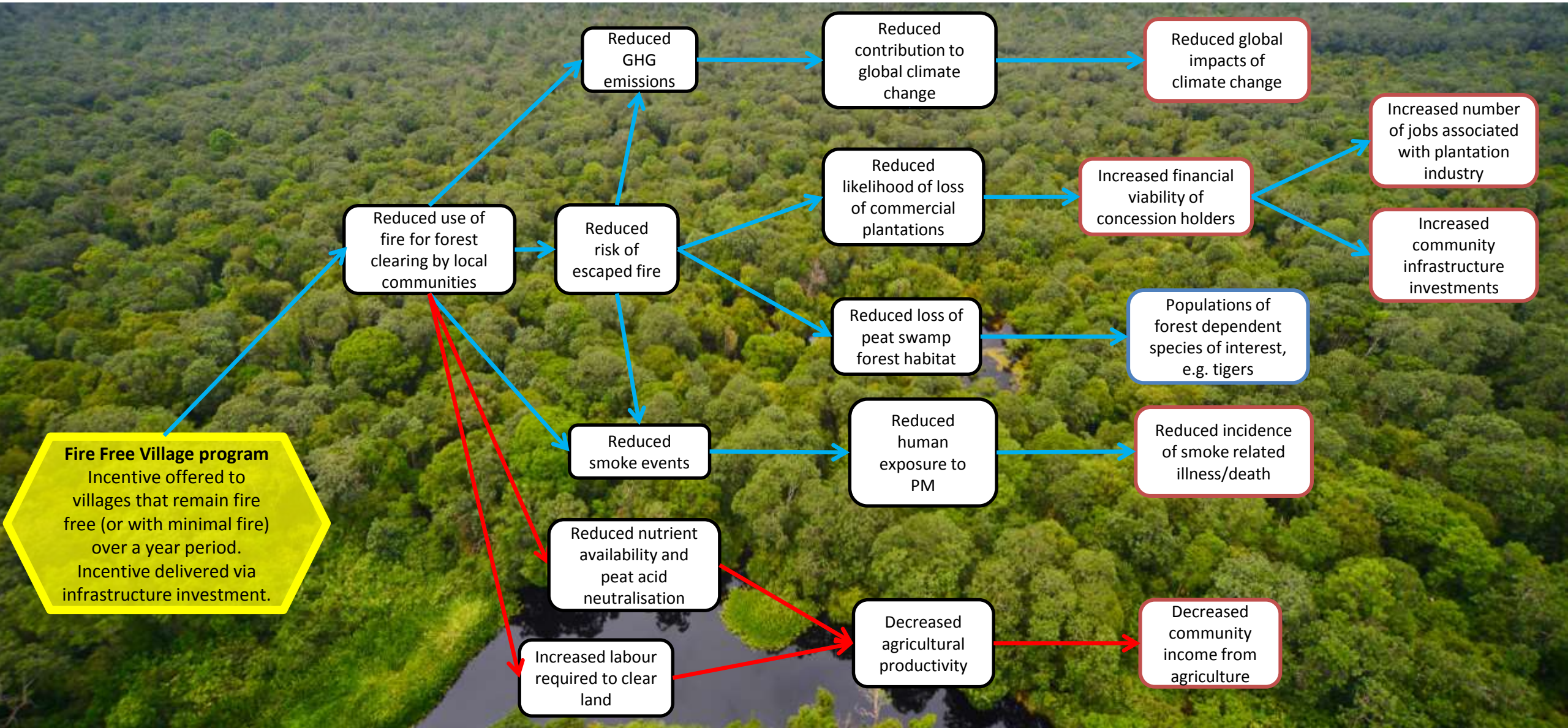

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Table: GRADE's approach to rating quality of evidence (aka confidence in effect estimates)

For each outcome based on a systematic review and across outcomes (lowest quality across the outcomes critical for decision making)

1. Establish initial level of confidence		2. Consider lowering or raising level of confidence		3. Final level of confidence rating
Study design	*Initial confidence in an estimate of effect*	*Reasons for considering lowering or raising confidence*		*Confidence in an estimate of effect across those considerations*
		↓ Lower if	↑ Higher if*	
Randomized trials →	High confidence	Risk of Bias Inconsistency Indirectness Imprecision Publication bias	Large effect Dose response All plausible confounding & bias • would reduce a demonstrated effect or • would suggest a spurious effect if no effect was observed	High ⊕⊕⊕⊕
				Moderate ⊕⊕⊕◯
Observational studies →	Low confidence			Low ⊕⊕◯◯
				Very low ⊕◯◯◯

*upgrading criteria are usually applicable to observational studies only.

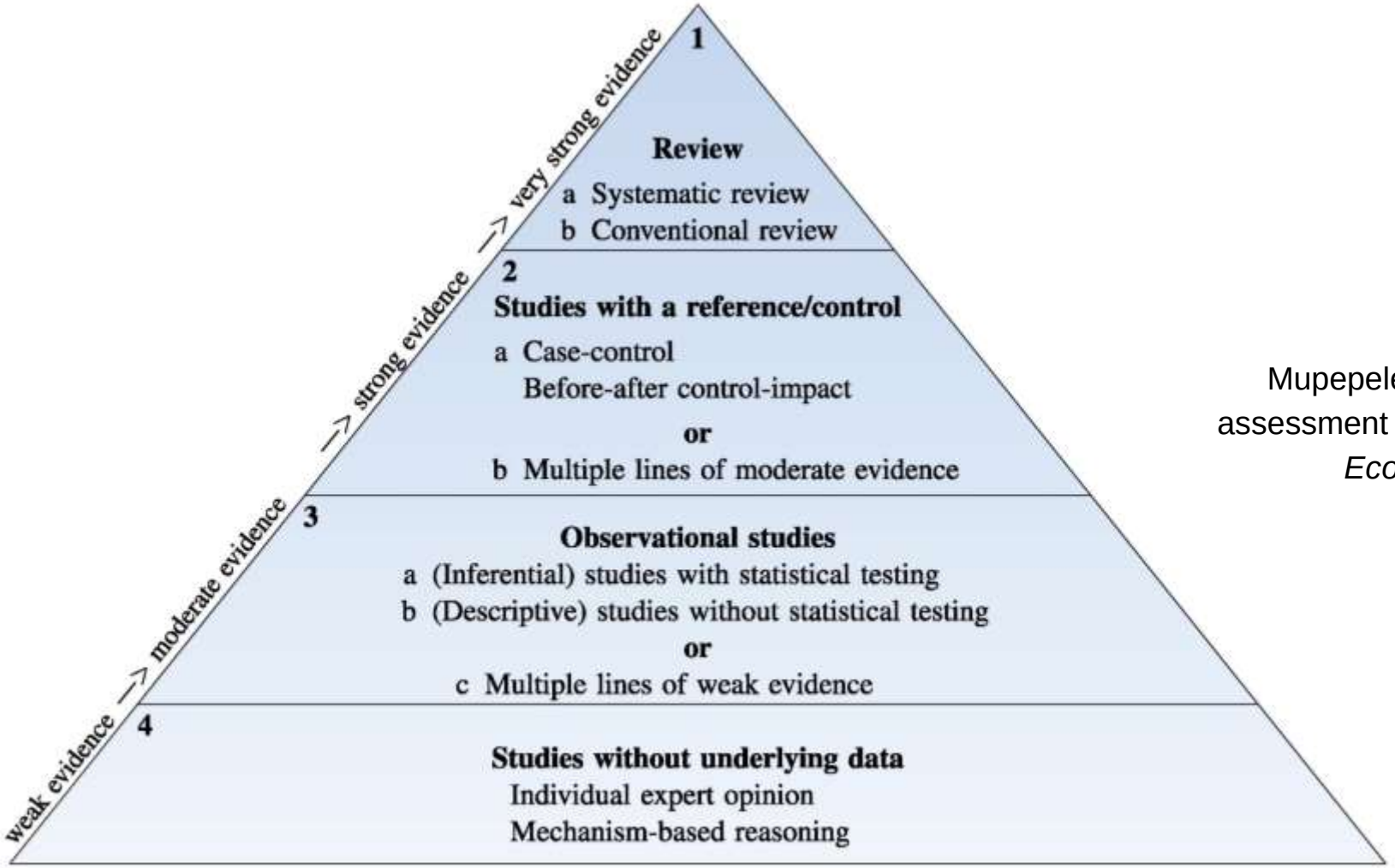

FIG. 2. Level-of-evidence (LoE) hierarchy ranking study designs according to their evidence. Very strong evidence (LoE1) to weak evidence (LoE4) with internally ranked sublevels a, b, and c.

Mupepele et al. 2016 An evidence assessment tool for ecosystems services *Ecological Applications*

interdisciplinary

- ecology
- ecosystem services
- social science
- environmental economics
- development economics
- development science
- health (National Institute of Health)
- law (Department of Justice)
- philosophy

principles for evidence evaluation

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Evidence evaluation should be based on a logic model that identifies **key causal pathways** from intervention to outcomes

For each link, a clear question should be stated, using **PI/ECO** frame (Population, Intervention/Exposure, Control, Outcome)

Information relevant to question should be gathered from **all relevant types**

Key considerations should be applied to the process of evaluating evidence

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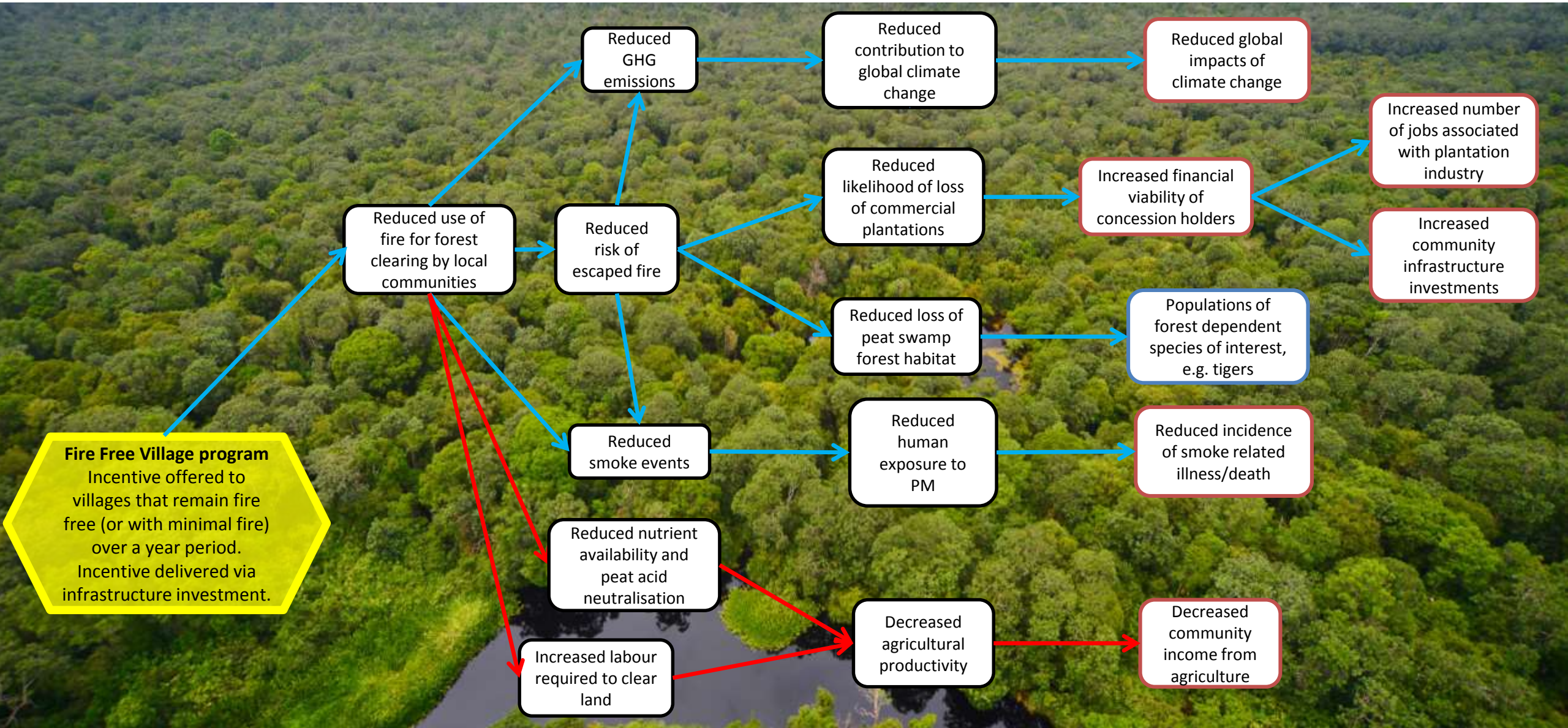

principles for evidence evaluation

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types of evidence

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Expert judgment

Models

Quantitative studies

Qualitative studies

Theory

Measurement results

principles for evidence evaluation

Evidence evaluation should be based on a logic model that identifies **key causal pathways** from intervention to outcomes

For each link, a clear question should be stated, using **PI/ECO** frame (Population, Intervention/Exposure, Control, Outcome)

Information relevant to question should be gathered from **all relevant types**

Key considerations should be applied to the process of evaluating evidence

key evidence considerations

- **Types** of evidence (single or multiple)
- **Consistency** of effect (agreement on sign, size, variance, range)
- **Reliability** (peer review, source/motivational bias, # of studies)
- **Applicability** (how well does the body of evidence fit the question)

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THE BRIDGE COLLABORATIVE

a partnership to forge a shared evidence base for health, development, and environment

the David & Lucile Packard FOUNDATION

Duke UNIVERSITY

PATH

The Nature Conservancy

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE
IFPRI

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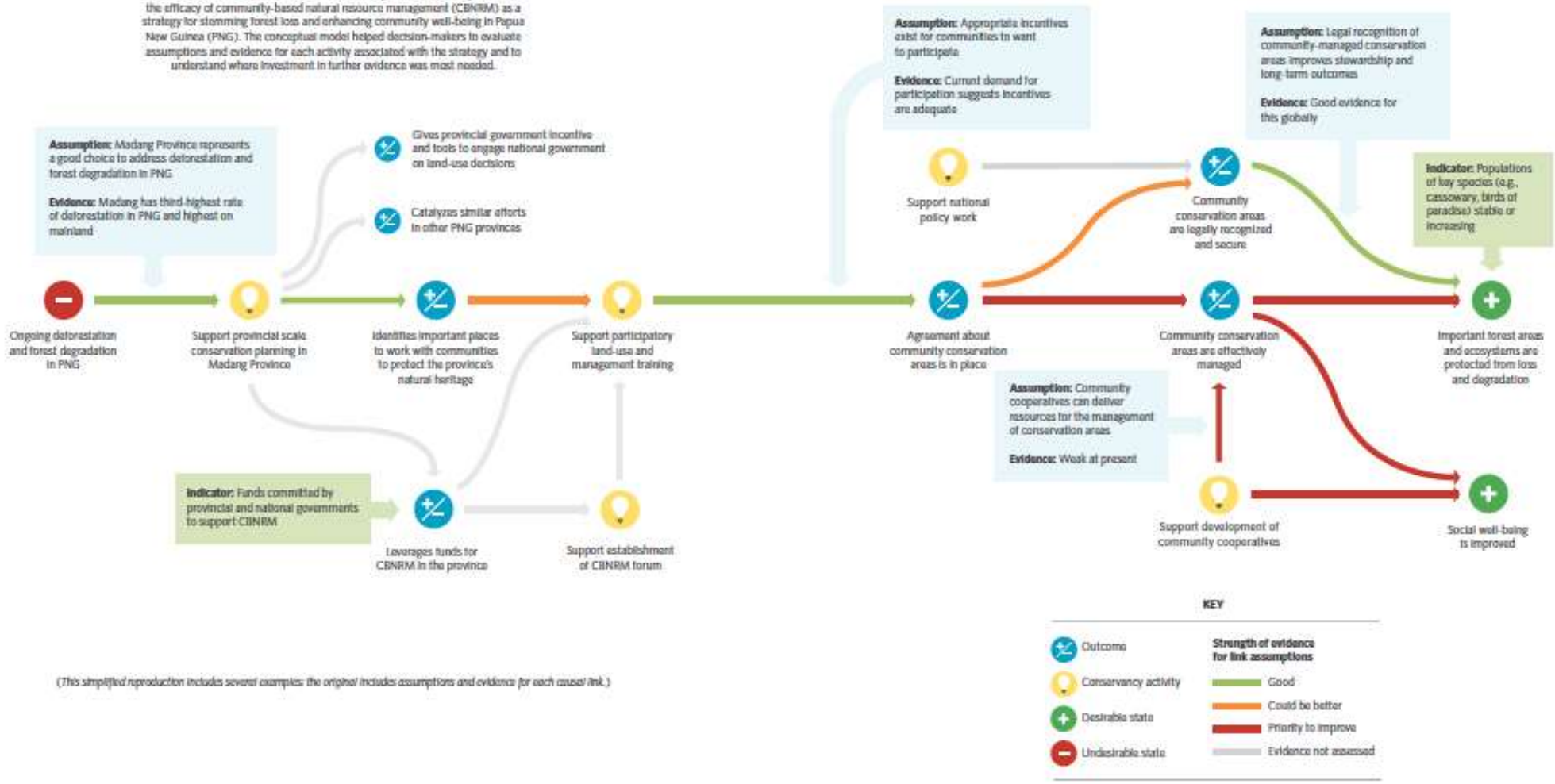
ASSESSING COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT

Nature Conservancy scientists created a conceptual model to help assess the efficacy of community-based natural resource management (CBNRM) as a strategy for slowing forest loss and enhancing community well-being in Papua New Guinea (PNG). The conceptual model helped decision-makers to evaluate assumptions and evidence for each activity associated with the strategy and to understand where investment in further evidence was most needed.



(This simplified reproduction includes several examples; the original includes assumptions and evidence for each causal link.)