

Impact of forest landscape restoration on mitigating erosion: a systematic review

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Introduction

- Optimizing fertilizer use is vital for improving crop productivity and resilience among smallholder farmers.
- Understanding farmers' perceptions and decisions about fertilizer use is crucial for designing effective interventions.
- Using a mental model approach makes it possible to uncover cognitive frameworks that guide farmers' innovation adoption decisions.

Objective and research questions

The main objective is:

- To identifying the most effective FLR practices for controlling erosion and the factors influencing their effectiveness across different contexts

To achieve this objective, the research discusses:

- the methodological approaches used to assess the impact of FLR on erosion mitigation;
- the forest landscape restoration approaches and practices employed to reduce erosion;
- the effectiveness of restoration efforts across diverse landscape contexts; and
- the unintended consequences associated with restoration interventions.

Methodology

- Based on PRISMA eligibility criteria, 80 studies were included in the final systematic review.

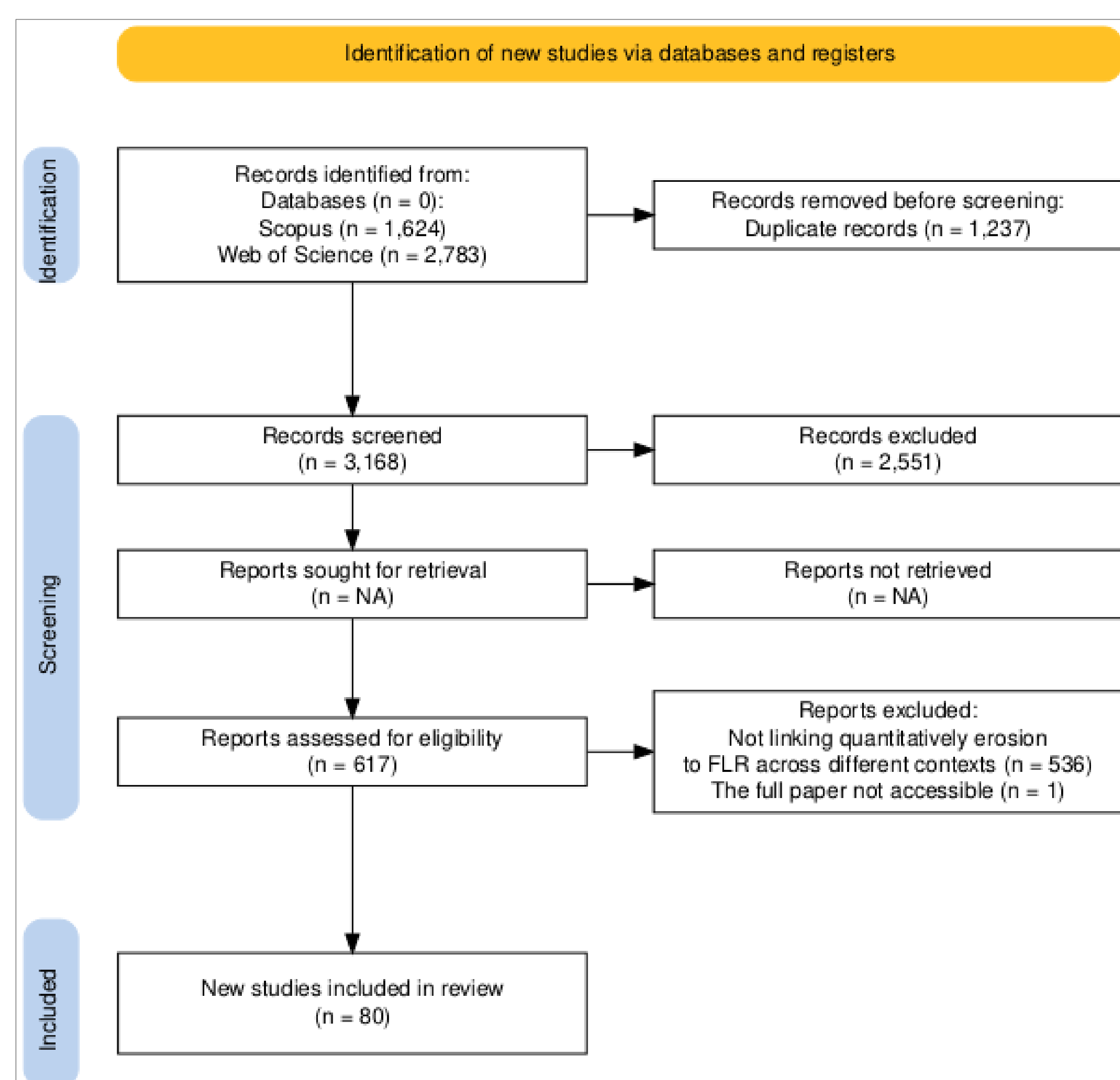


Figure 1: Data search and screening procedure applied in this study based on PRISMA 2020 (Online version adapted from Haddaway et al. (2022)).

Results

- FLR effectiveness is highly context dependent, shaped by a combination of:
 - exogenous factors (e.g., environmental conditions) and
 - endogenous ones (e.g., vegetation characteristics).

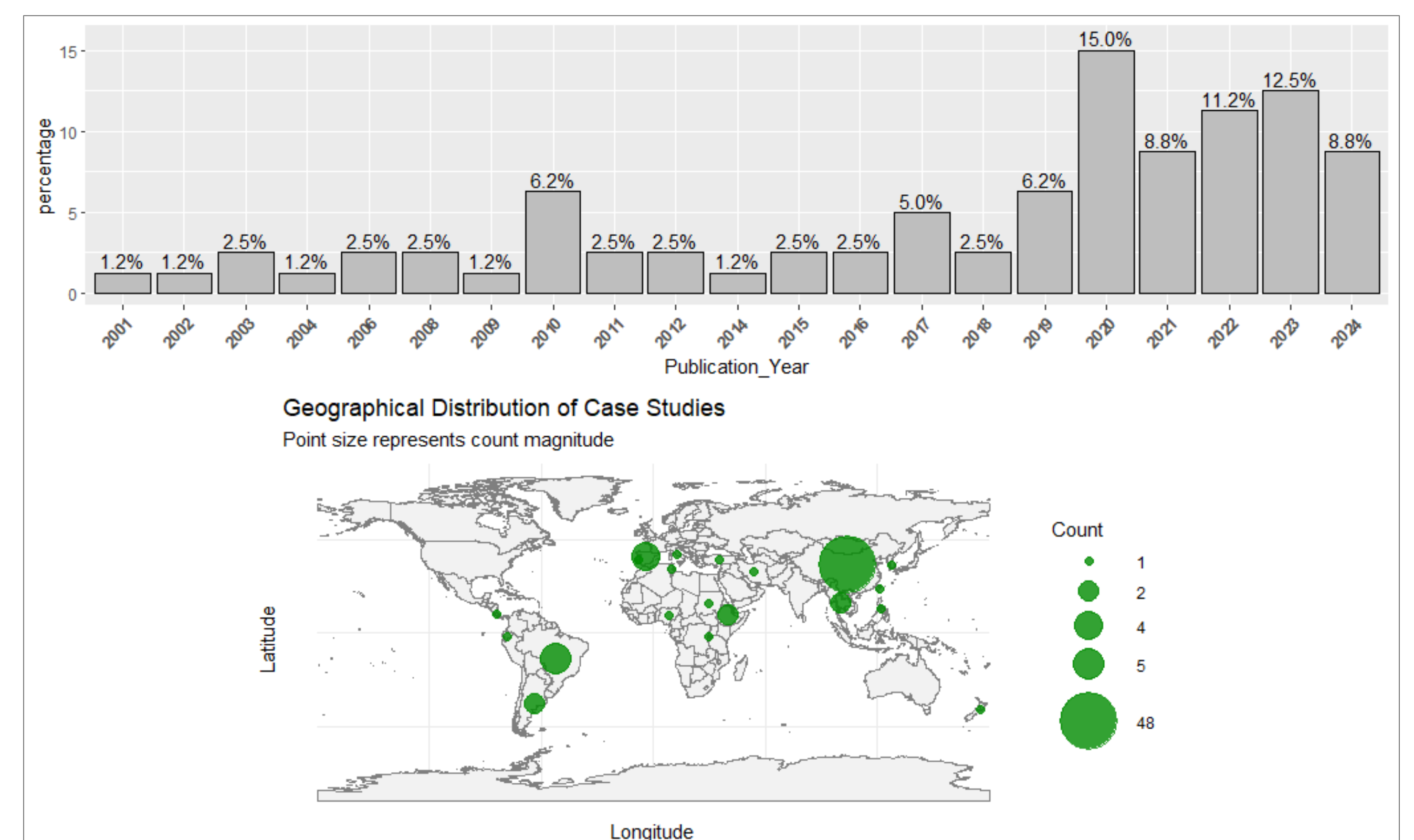


Figure 2: Number of case studies by year of publication and by country.

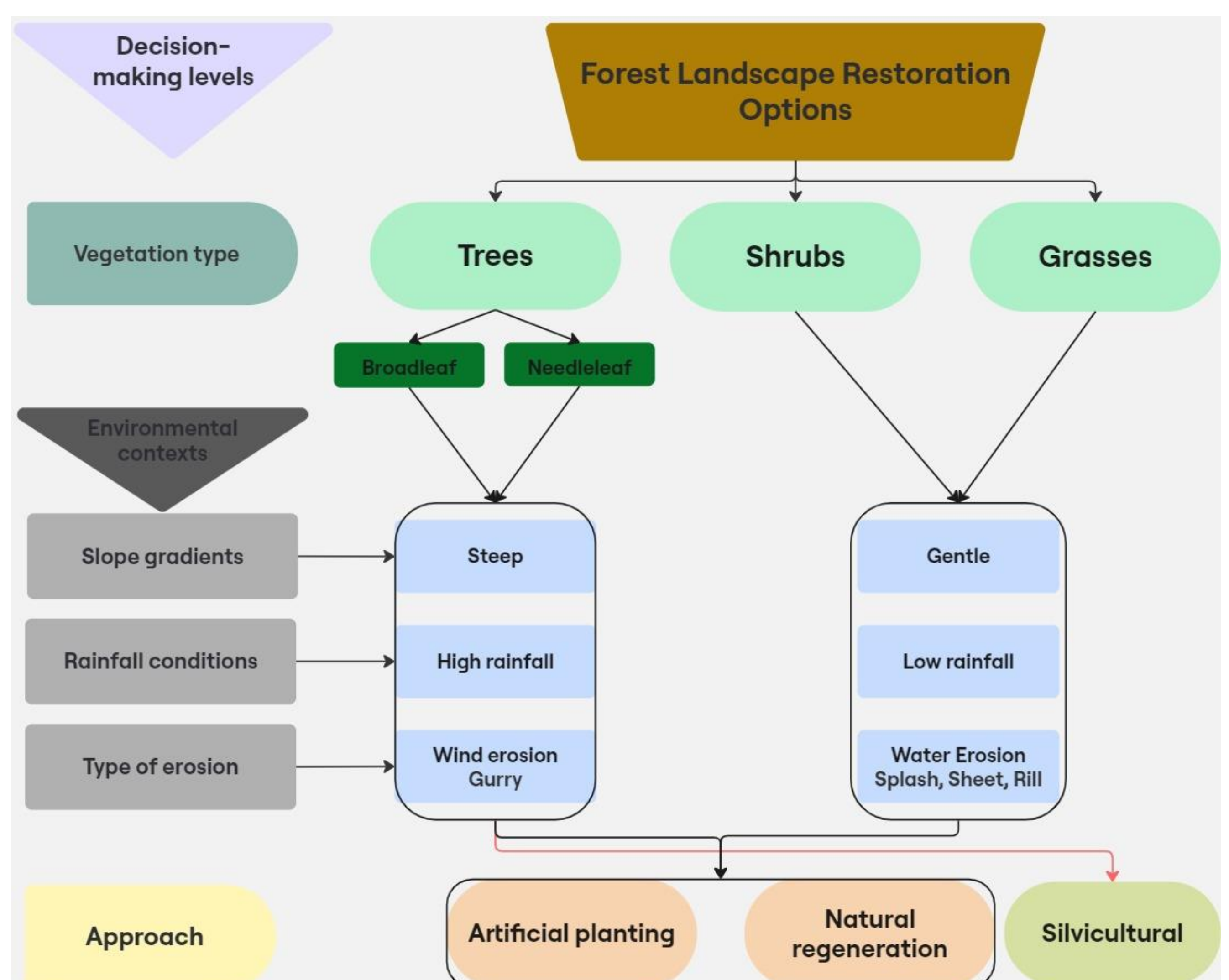


Figure 3: Decision-making framework for selecting the most suitable FLR option based on environmental conditions.

Conclusion

- Our findings support previous studies that land use and land cover as key determinants of soil erosion but also emphasize that slope gradient and rainfall intensity are equally critical.
- Given the various factors influencing FLR selection and the multiple levels of interaction, trade-offs are inevitable.
- Research gaps**
 - Geographical concentration of evidence
 - Limited use of integrated methods
 - Insufficient attention to implementation and maintenance
 - Limited consideration of interacting factors influencing FLR effectiveness
 - Limited exploration of unintended outcomes