

Cracking the Brazil Nut puzzle : Can Nut Gathering and Timber Harvesting Coexist?

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Introduction

Non-timber forest products (NTFPs) can provide a livelihood for forest communities in the tropics. Yet, forests are becoming more accessible to logging companies. Thus, it is vital to develop forest management practices that do not jeopardise NTFPs. Brazil nut (BN), *Bertholletia excelsa*, is important due to its high market value, and the need for near intact forest for production.



Fig 1: Two Brazil nut trees in Acre, Brazil credit: Jürgen Blaser

Objectives

- 1: Identify most important factors for BN productivity
- 2: Assess which forest management techniques can enhance BN production in natural stands and minimize trade-offs incurred during timber harvest
- 3: Assess effects of differing social and policy contexts on practices and stakeholder perceptions

Methods

Systematic review in “web of science” using the search string “Brazil nut” as topic on 25.08.2019 → 1249 papers

Refining results to relevant categories: forestry, environmental studies, plant sciences, biodiversity conservation, ecology, biology, agriculture multidisciplinary, agronomy, horticulture, entomology, environmental sciences” → 471 papers

Limited to documents containing search terms in title → 166 papers
Process above repeated with search string “*Bertholletia excelsa*” → 72 papers

Combination of both searches → 189 papers → overlapping results

Further selection according to the potential relevance estimated by analyzing the titles and abstracts → 61 papers

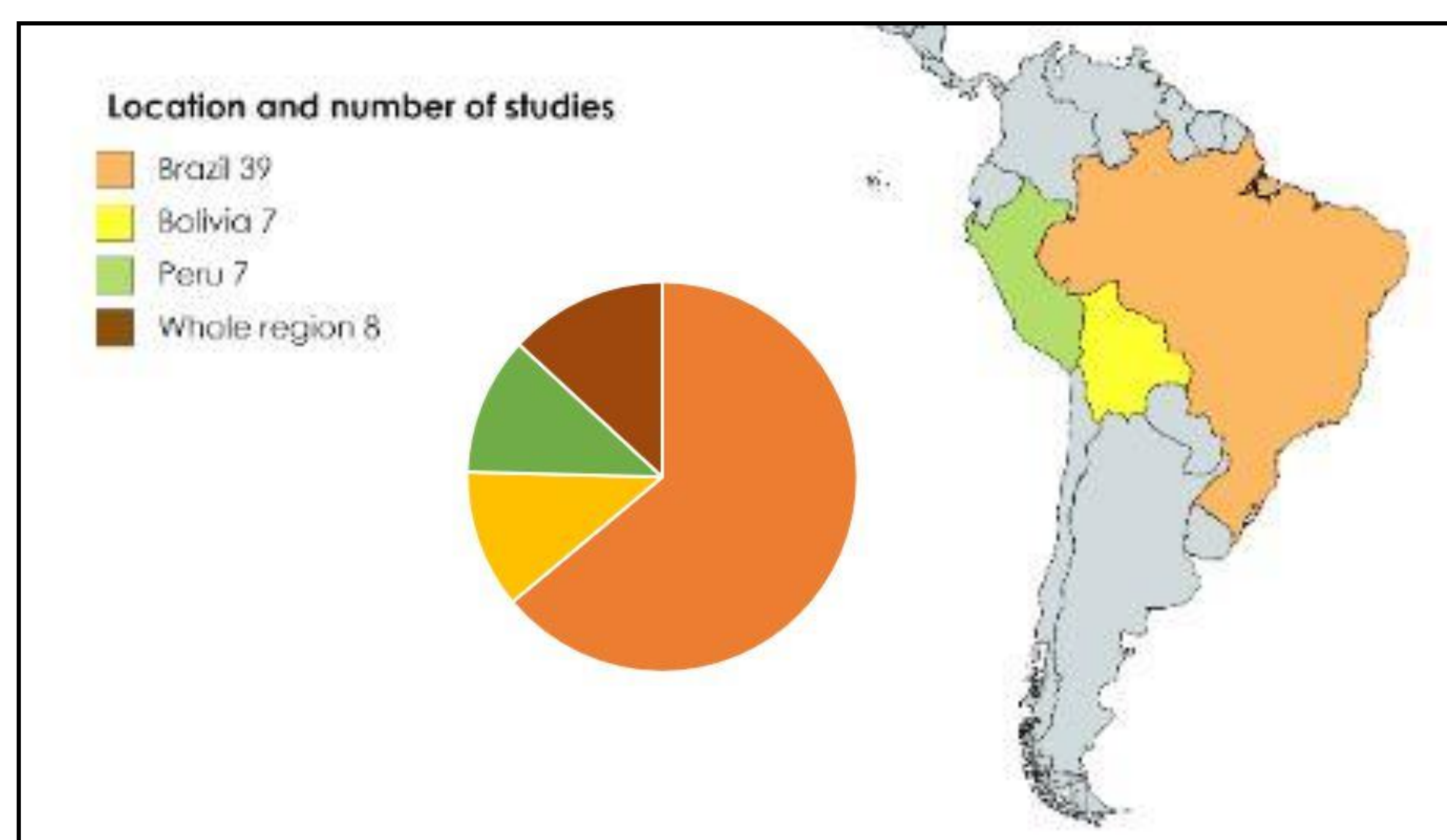


Fig 2: Location and number of studies on Brazil Nut (n=61)

Results

- Main yield-influencing factors: size, crown position, liana load, yearly variation, genetics, climate, soil and pollination
- 98% of trees >40 cm diameter at breast height are productive
- Emergent rather than suppressed crown essential for productivity
- At DBH >100 cm, crown size most important factor
- Higher productivity on soils with higher CEC and available P
- Liana cutting greatly increases yield over time
- Improved regeneration in shifting cultivation fields compared to logging gaps

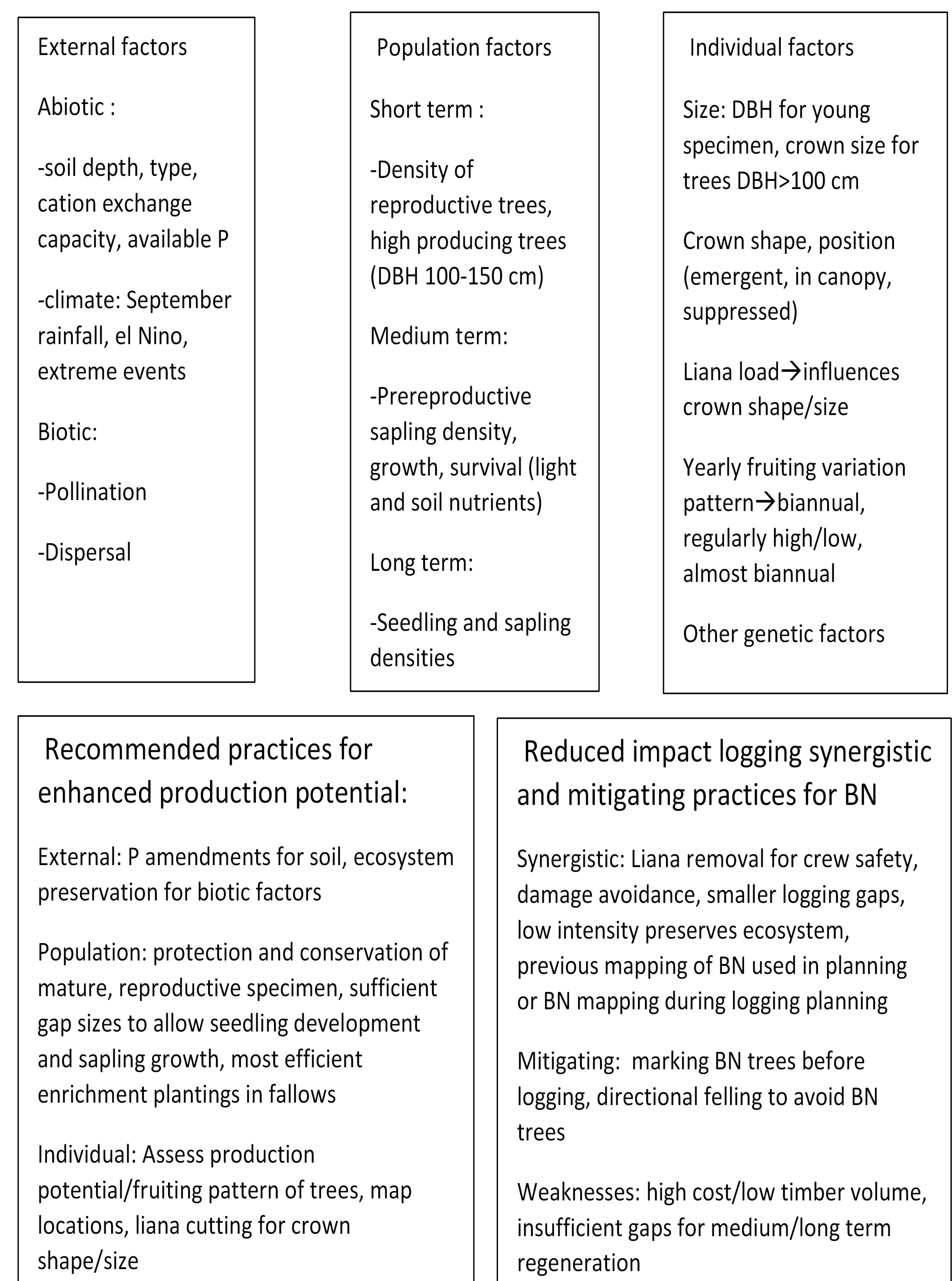


Fig 3: Scheme aggregating the main findings

Conclusions

- Coexistence, even synergies between nut gathering and timber harvest are possible
- These depend on applied forestry practices, location and timing
- Logging activities should be planned with nut gatherers if they are not executed by them.
- Institutional barriers such as unclear and conflicting legal frameworks hinder the integration of both livelihoods

Selected References

- Kainer et al. 2007. Explaining variation in Brazil nut fruit production. *For Ecol Manag*, 250 (3), 244–255.
Kainer et al. 2014. Testing a silvicultural recommendation: Brazil nut responses 10 years after liana cutting. *J Appl Ecol*, 51 (3), 655–663.
Kainer et al. 2018. The evolving role of *Bertholletia excelsa* in Amazonia: contributing to local livelihoods and forest conservation. *Desenvolvimento e Meio Ambiente*, 48.
Paiva et al. 2011. Brazil nut conservation through shifting cultivation. *For Ecol Manag*, 261 (3), 508–514.
Rockwell et al. 2015. Nut Production in *Bertholletia excelsa* across a logged forest mosaic: Implications for Multiple Forest Use. *PloS one*, 10 (8), e0135464.
Soriano et al. 2012. Implementing multiple forest management in Brazil nut-rich community forests: Effects of logging on natural regeneration and forest disturbance. *For Ecol Manag*, 268, 92–102.
Wadt et al. 2005. Population structure and nut yield of a *Bertholletia excelsa* stand in Southwestern Amazonia. *For Ecol Manag*, 211 (3), 371–384.
Willem et al. 2019. Brazil nut forest concessions in the Peruvian Amazon: success or failure? *Int For Rev*, 21 (2), 254–265.
Zuidema PA, 2003. Ecology and management of the Brazil nut tree (*Bertholletia excelsa*). *PROMAB*, Utrecht [etc.], 112 p.