Forest Enrichment with Brazil Nut – An Economic Perspective

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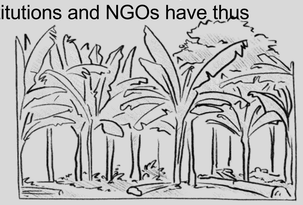
1 Problem

Brazil Nut is one of the few globally traded NTFPs. Its production of 30 megatons per year, is a substantial part of the global nut production. Also, it often goes hand in hand with the sustainable management of highly biodiverse rain forests and their services for humans. In order to keep the concession-based smallholder Brazil nut production in Madre de Dios, Peru, competitive with more intense alternative land uses (mining, cattle ranching), it is crucial to extract a certain production volume per area. Planting activities have thus undergone a significant increase in the region in the past decade. Different practices have been identified and proven to work. Many institutions and NGOs have thus started to offer support for smallholders. Previous studies have though rarely addressed the involved financial implications from a smallholder perspective. Collecting information on enrichment practices and involved costs and benefits may help identifying financial leeway for those 30'000 people living from Brazil Nut in the region.



Banana field, as an alternative more intense land use.

2 Research Question and Implications

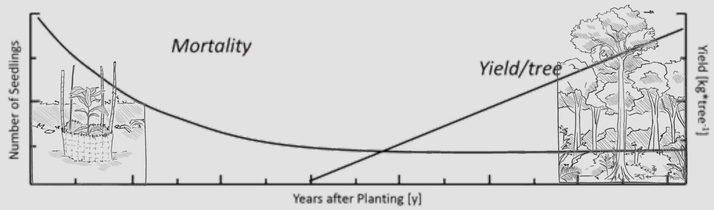
◉ **How profitable do current practices prove to be on different Brazil nut planting sites and when do they start to pay off?**
Which practice to chose? Are cheaper loans needed?

◉ **What are the most relevant costs?**
Where can costs be reduced most efficiently?

◉ **Can smallholders, with their current livelihood be expected to pay for the needed planting activities?**
Does traditional Brazil nut forest management and harvesting need new incentives?

Conserving forests by maintaining traditional Brazil Nut extraction would favour the SDGs 1, 2, 12, 13 and 15.

3 Method: B-C-Analysis and Yield Prediction

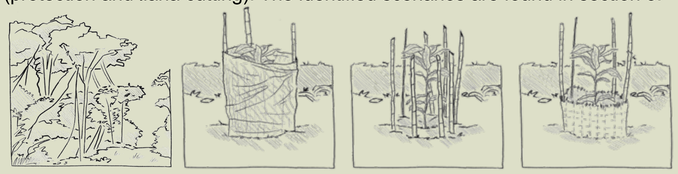


The model of growth, production and mortality. Seedling mortality reduces the finally producing number of individuals. These remaining individuals increase their production linearly.

In this thesis a Benefit-Cost-Analysis (BCA) was used to examine a range of 19 scenarios of combined planting practices. Those practices and their cost-values were investigated with a structured questionnaire with Brazil nut producers. Benefit-values were modelled with basic empirical growth-, yield-, and mortality functions. Future price development was anticipated with qualitative expert interviews. Resulting profitability values were used to give recommendations about the practices to be favourably applied. Further recommendations could be drawn from analysing the height of the initial investment and the first year of amortization of said scenarios. These results were then compared with an analysis of the profitability of the current concessions.

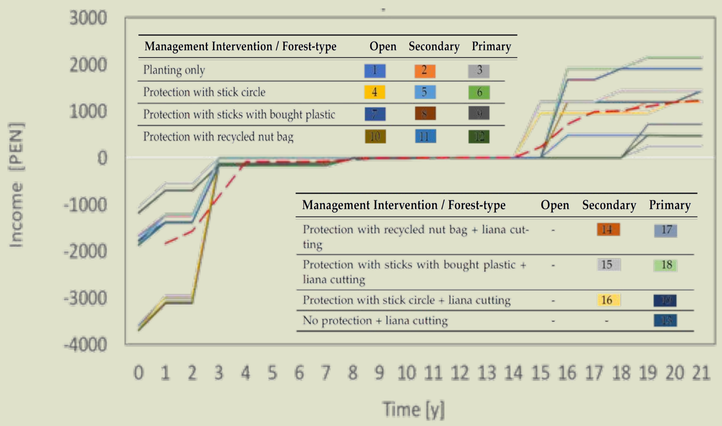
4 Classification of Scenarios

The scenarios have been defined by verifying practices from the literature throughout the interviews. Eventually, the 19 scenarios were defined along the line of three land use types and a combination of four applied interventions (protection and liana cutting). The identified scenarios are found in section 5.



The four used interventions, l.t.r. : Yearly Liana Cutting, Bought plastic, Palm Sticks, Recycled Nut-Bags

5 Scenario Plotting



Management Intervention / Forest-type	Open	Secondary	Primary
Planting only	1	2	3
Protection with stick circle	4	5	6
Protection with sticks with bought plastic	7	8	9
Protection with recycled nut bag	10	11	12

Management Intervention / Forest-type	Open	Secondary	Primary
Protection with recycled nut bag + liana cutting	-	14	17
Protection with sticks with bought plastic + liana cutting	-	15	18
Protection with stick circle + liana cutting	-	16	19
No protection + liana cutting	-	-	20

Total Income per year for each scenario over 21 years in order to maintain the local population of Brazil nut. In converted forest (open), recovering forest (secondary) and forest gaps (primary).

6 Relevant Outcomes

Enrichment planting in most cases only becomes profitable over a time horizon of 40 years. Payoff time varies between the scenarios. Results suggest that planting in secondary forest is promising. The most relevant costs are the labour costs, most importantly of cleaning the planting site. Throughout the scenarios the smallholders are only sporadically able to pay for their planting activities. These recommendations could be given:

◉ Use recycled material ◉ Use secondary forest sites ◉ Clear lianas regularly ◉ Engage in price stabilizing associations ◉ Put more effort into work planning & combination ◉ Long-Term Project: Be Patient! ◉ Speak about concession-inheritance and land tenure◉ Planting involves high uncertainties ◉ Current support is often insufficient ◉ Long-term synergies are needed

Answers to:

In Secondary Forest? **In Primary Forest?** **On Fields?** **How many Seedlings?** **Protection: Yes or no?** **Which protection?** **How much to spend?** **How much do I earn?** **When do I earn?**

Illustrations made by Lucas Pfister (2019)