Title: Seeking sustainability in the Amazon: Shifting from Brazil nut exploitation to conscious management

Authors: Kainer, Karen; Wadt, Lucia; Staudhammer, Christina; Duchelle, Amy

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Abstract of the paper: Brazil nut (Bertholletia excelsa) has recently emerged as a cornerstone of the Amazonian extractive economy and a centerpiece of conservation efforts, particularly in the border region of Brazil, Bolivia and Peru. Occupying this distinctive nexus between biodiversity conservation and local livelihoods has precipitated a shift from general exploitation of Brazil nut to more conscious management. Drawing heavily on our long-term research and experiences with regional harvesters in this tri-country region, we ask: (1) Is Brazil nut extraction sustainable in terms of fruit production and resilience to nut (seed) collection? (2) How is Brazil nut currently managed? and (3) How might more intensive management augment production? We found that annual variation of fruit production at the individual tree level was relatively high, but that population-level variation was low, with production declines observed in years of delayed and reduced rainfall. Trees in the mid-diameter range (100 cm = diameter at breast height 150 cm) produced the most fruits, and approximately 25% of trees studied produced 72% of total production. Population structures in three harvest sites (including seedling counts in 36 nested subplots of 25 x 25 m in each of four 9-ha plots per site) were roughly represented by reverse-J size class distributions, suggesting healthy demographic populations whereby mortality of large trees would likely result in growth of smaller individuals. Despite current nut collection intensities of up to 71% of the annual crop, natural regeneration was sufficient for population persistence, and anthropogenic disturbance through shifting cultivation resulted in even higher natural seedling densities. Interviews with 300 harvesters in 24 communities in Bolivia, Peru, and Brazil revealed consistency in liana cutting, but minimal planting, tending, or protecting of seedlings; differing certification schemes promoted environmental practices, affiliation with cooperatives, or enhanced product quality through management. Our findings also suggest that more intensive management could augment Brazil nut production via (1) liana cutting; (2) regeneration tending, and (3) enrichment planting by forest residents in shifting cultivation plots, forest gaps and even small pastures. Brazil nut demonstrates multiple characteristics that confer ecological resilience to seed collection and shows great promise for more intensive management when integrating local ecological knowledge and scientific research. The socioeconomics of sustainable management may be the greatest challenge, involving interlinked competitive land uses, nut quality for a demanding global market, and substantial increases in local income from nut harvest and processing.

Email: kkainer@ufl.edu, lucia@embrapa.cpafac.br, staudham@ufl.edu, duchelle@ufl.edu

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