

ATSAF Academy
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Junior Scientists Tandems

Final Report

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**Title: PERCEPTIONS AND ADAPTIVE RESPONSES TO AGROFORESTRY
INTERVENTIONS: EXPERIENCES OF INDIGENOUS, NON-INDIGENOUS, AND
FEMALE SMALLHOLDER FARMERS IN SAN MARTÍN, PERU**

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**PERCEPTIONS AND ADAPTIVE RESPONSES TO AGROFORESTRY
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“An agroforestry system is a specific local example of a practice”

- Anthony Young (1998)

Study Context and Motivation

The Peruvian Amazon, one of the most biodiverse regions in the world, is home to approximately 73.3 million hectares of forests out of a total area of 128.5 million hectares (GreenMarked, 2024), representing 57.3% of Peru’s national territory (MINAM, 2016). At the same time, deforestation poses a severe environmental challenge. Nearly 2.8 million hectares of tree cover were lost between 2001 and 2021, an alarming rate equivalent to 7.6 soccer fields per minute (Envol Vert, 2023). By 2018, Peru ranked as the seventh country with the highest tropical forest deforestation, with approximately 13% of its Amazon already cleared (ibid.). Most of this deforestation is small-scale and linked to family farmers practicing slash-and-burn agriculture on plots of less than five hectares (MINAM, 2016). San Martín, one of Peru’s major coffee and cacao producing regions (Jezeer et al., 2018; PRODUCE, 2023), has stood out as a hotspot of agroforestry practices and research in the Peruvian Amazon (Láinez, 2006; SERFOR, 2022). However, it is one of the most heavily deforested areas, having lost approximately 458,000 hectares of humid primary forest between 2002 and 2024 (Global Forest Watch, 2025).

In the Amazon, where biodiversity and ecological functions are globally significant, Abreu and Watanabe (2016) note that far less attention has been paid to how local populations manage natural resources or how these practices relate to conservation, agrobiodiversity, and food security. In 1995, the former Director General of ICRAF emphasized that understanding how farm households make land-use decisions is *“as essential as understanding the competition between tree and crop roots”* (Mercer & Pattanayak, 2003, p. 283). It is therefore essential to understand how farmers, who are the local implementers and managers of agroforestry systems, perceive and adapt these systems. This will help to design sustainable interventions that are ecologically effective, socially inclusive, and aligned with farmers’ lived realities. The aim of

this research was to address these gaps by examining how farmers in San Martín perceive the benefits and challenges of agroforestry interventions implemented by two different organizations, and how these perceptions shape the adaptations they have made to their systems.

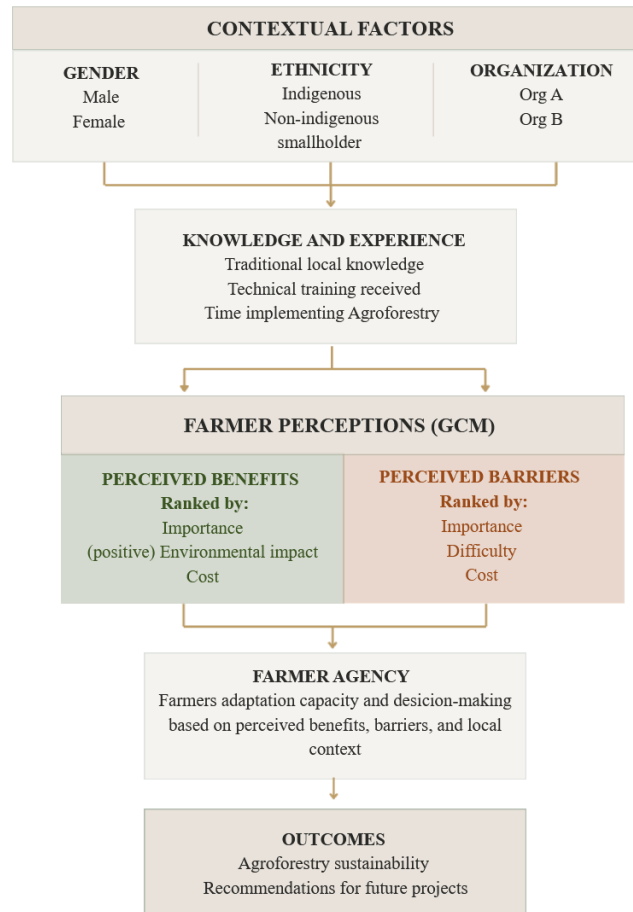


Photo from a slash and burn plot in San Martín where Coffee and Inga edulis was planted by an indigenous farmer.

Research question

The research question guiding this thesis is: *What are the perceptions of farmers in San Martín, Peru, regarding the benefits and challenges of agroforestry interventions, and how do these perceptions influence adaptation agency and the sustainability of these systems over time?* To answer this question, the study draws on semi-structured interviews and participatory focus group discussions with three social groups: indigenous smallholder farmers, non-indigenous smallholders, and women farmers and spouses. Figure 1, suggests that contextual factors, farmer experience and organizational influences shape the perceived benefits and barriers of agroforestry (as elicited through Group Concept Mapping methodological approach), and that these perceptions inform farmer agency in influencing the sustainability of agroforestry systems and their outcomes.

Figure 1. *Integrated conceptual model developed for this study*

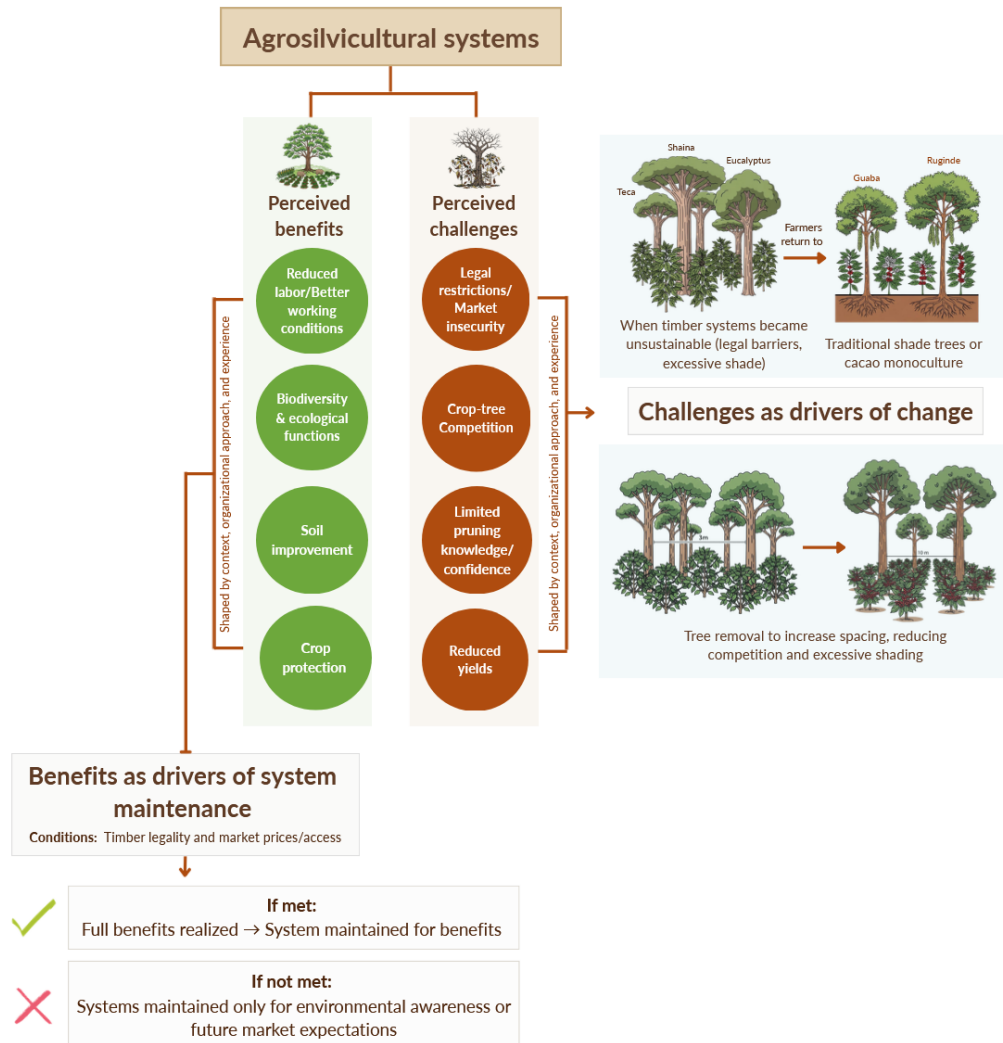


Source: Own elaboration

Results

Figure 2 synthesizes how farmers' perceived benefits and challenges shape two distinct system trajectories. Benefits, such as reduced labor, ecological functions, soil improvement and crop protection, act as drivers of system maintenance when market and legality conditions allow their full realization. Conversely, challenges, including legal restrictions, market insecurity, crop-tree competition, limited pruning knowledge and reduced yields, act as drivers of system change, prompting adaptations such as tree removal, pruning and shift from timber species to traditional shade trees. Both pathways are influenced by farmers' context, organizational support, training, and accumulated experience. The visual illustrates how perceptions influence adaptive decision-making and the sustainability trajectories of agroforestry systems.

Figure 2. Pathways linking perceived benefits and challenges to farmers' adaptive responses in agroforestry systems



Source: Own elaboration

Field Research Experience

I arrived in Tarapoto, Peru, in May. Shortly after my arrival, I began contacting local organizations. I am especially grateful to CIFOR-ICRAF for facilitating my first connections, as their support generated a sense of trust that encouraged many organizations to collaborate with my research, whether by participating in the study, sharing contacts, or offering me a physical workspace. The experience of visiting farms and getting to know farmers and Indigenous communities opened a beautiful path for me. Their openness allowed me to engage

deeply with their daily lives, traditions, and knowledge. I was welcomed into their food, customs, and stories. Many farmers walked with me through their plots, showed me unfamiliar fruit trees, and offered fruits I had never seen before. Their generosity and openness made the experience deeply meaningful. These encounters helped me feel genuinely integrated into the community and enriched my understanding of local agroforestry practices.

At the same time, I was attentive to the fact that my interviews were long, and it sometimes felt uncomfortable to take up their time when I knew they had work to do. However, farmers remained extremely cooperative and were often enthusiastic to talk, ask questions, and hear stories about my home country and Germany. One of the main challenges was locating individuals who had participated in an agroforestry project more than twenty years ago. No participant lists were available, so the process for that group of participants relied entirely on snowball sampling, visiting small villages, asking for names, and following each new lead. Although demanding, this approach turned into a memorable experience, involving long walks through fields and forests in search of the next household, and offering unexpected opportunities to discover landscapes and meet new people.

I am deeply thankful to ATSAF for enabling this fieldwork. It allowed me to develop essential research skills, such as working with primary qualitative data, conducting long semi-structured interviews, and managing large audio datasets. Beyond these technical aspects, the experience profoundly shaped me personally. I returned with a deeper understanding of rural life in the Peruvian Amazon, greater confidence as a researcher, and a thesis that I truly enjoyed researching and writing.

