

COURSE REPORT

Management of Agroforestry Systems

September 30–October 1, 2024
Eunápolis, Bahia, Brazil

A field course organized by:

- The Environmental Leadership & Training Initiative (ELTI), Yale School of the Environment
- Instituto de Pesquisas Ecológicas (Institute for Ecological Research [IPÊ])
- Projeto de Desenvolvimento Socioambiental para Agricultura Familiar do Núcleo de Estudos em Agroecologia e Produção Orgânica Pau-Brasil, Universidade Federal do Sul da Bahia (Socio-Environmental Development for Family Farming Project [DSAF] at the Pau-Brasil Center of Studies in Agroecology and Organic Production [NEA-PB], Federal University of Southern Bahia [UFSB])
- Instituto Fotossíntese (Photosynthesis Institute)



Photosynthesis Institute

"Management of Agroforestry Systems" course participants.

Background: Southern Bahia is characterized by vast areas of industrial-scale eucalyptus plantations, livestock pasture, fruit and vegetable farms, and coffee and cocoa plantations, none of which contain much native biodiversity. This landscape, however, is interconnected with native forest remnants, other areas controlled by agricultural partnerships, and new farms championing agroforestry systems, where biodiversity plays a bigger role. The adoption of biodiverse systems is more prevalent among small rural properties aiming for optimal land utilization.

ELTI is an initiative of:

Yale SCHOOL OF THE ENVIRONMENT
The Forest School



Course participants conduct a practical activity in soil covering.

In these regions, numerous rural communities have been established through the subdivision of large estates, including through agrarian reform, purchases with rural land credit, and purchase agreements with forestry companies. Among these communities, the adoption of management practices integrating biodiverse coverage is gaining traction as a strategy for both environmental and financial sustainability. Crop intensification, incorporation of high-profit crops, community processing, and integration into local production chains are contributing to increased income, diversified food production for family consumption, and value addition.

On November 7–8, 2023, ELTI-IPÊ, in partnership with the Socio-Environmental Development for Family Farming Project [DSAF] and the Instituto Fotossíntese (Photosynthesis Institute), offered the field course “Agroforestry Planning” at two family farms in the Nova Vitória Rural Association in Eunápolis, Bahia. The course aimed to provide small farmers, particularly those in land reform areas, with planning tools to implement biodiverse and agroecological production systems that enhance landscape connectivity. A total of 23 participants attended that course, representing the Nova Vitória, Maravilha, Produzir, and Irmã Dorothy Stang Rural Associations. The current course, “Management of Agroforestry Systems,” offered exclusively to alumni of the previous course, served as a continuation of the 2023 training. This course is essential for equipping farmers with the practical skills needed to effectively implement and sustain the systems



Photosynthesis Institute

Ryu Okada gives a lecture.



Photosynthesis Institute

Theoretical session on review and contextualization of an agroforestry system.



Photosynthesis Institute

Review session on agroforestry planning.

planned during “Agroforestry Planning.” While the previous course focused on designing biodiverse and agroecological production systems, this follow-up training builds on that foundation by addressing key management practices.

ELTI-IPÊ and its partners offered this course to facilitate the transition to land use practices more supportive of biodiversity. Anticipated positive environmental outcomes resulting from the proliferation of these practices include enhanced structural connectivity, improved soil quality, restoration of Legal Reserves, reduced pesticide use, and preservation of regenerating forest fragments capable of providing numerous other environmental services.

Course objectives: The course provided a comprehensive overview of the practical aspects of managing agroforestry systems, emphasizing biodiverse and agroecological production systems and the potential for landscape connectivity.

- Soil preparation
- Bed preparation
- Organic fertilization
- Integrated pest and disease control methods
- Species selection
- Choosing genetic material suppliers
- Agroforestry succession management
- Commercialization strategies

Course content: The course took place over two days, combining theoretical sessions and practical activities focused on agroforestry management.

Day 1

Participants and instructors gathered at the plot of Maria Nogueira de Souza and Valdeny dos Santos Prado, where they began with breakfast followed by a review of concepts from the agroforestry planning course. Isabela Oliveira Leite,



Photosynthesis Institute

Course participants plant seeds for green manure.

João Pedro Lenz, and Lucas Peranovich (all from Photosynthesis Institute/DSAF) led the introduction to agroforestry practices. Next, Ryu Okada (Photosynthesis Institute) presented a financial projection for the plant mixture, which included essential oils, arrowroot, corn, and green manure. Following Okada's presentation, the group discussed the implementation of the agroforestry system and its challenges, such as ant control, cattle intrusion, dry periods, and weed management. In the afternoon, Lenz and Peranovich led a practical activity focused on soil quality monitoring and biomass production as a cover crop. Participants then had the opportunity to practice techniques for crop harvesting and replanting the commercial species before planting green manure seeds. The day ended with an evaluation of the day's activities and preparations for the next day.

Day 2

The second day's activities took place at the plot of Patrícia Amorim do Santos and Jardson de Oliveira Manguera, starting with breakfast. Leite provided a review and contextualization of the agroforestry system. Lenz and Peranovich then presented plant management techniques, covering genetic variability, organic fertilization, and natural alternatives for pest and disease control. Okada shared the financial projection for the agroforestry system of bananas, cocoa, fruit trees, and timber species. Lenz and Manguera shared their experience using the fungal pathogen *Beauveria* for pest control in banana trees. After lunch, Peranovich spoke on cocoa planting, emphasizing the benefits of using *Gliricidia* and interplanting it in rows. Participants then engaged in practical activities related to cocoa planting followed by the planting of green manure with mombaça grass, pigeon peas, and rattlepod. The day concluded with a coffee break and a final discussion and course evaluation.



“Management of Agroforestry Systems” course participants.

Participants: The course had a total of 12 participants: six farmers from the Nova Vitória Rural Association, three agricultural analysts from the Bahia State Agricultural Defense Agency, two students from UFSB, and an independent professional (agroindustry technologist and farmer). One of the UFSB students also works at the Porto Seguro city hall. All participants were alumni of the field course “Agroforestry Planning” held in November 2023.

Maria Otávia Crepaldi (Brazil program coordinator, ELTI), Mabel Ludka (Brazil program assistant, ELTI), Narezi, Okada, and Peranovich planned and organized the course. The Photosynthesis Institute team was responsible for promoting it within the rural associations, handling registrations, and managing local logistics. Sabrina Weber (Brazil program administrative assistant, ELTI) provided administrative support. Okada, Peranovich, Lenz, and Leite were the course instructors.

Outcomes and follow-up: In the end-of-course survey, 12 participants rated the overall course experience and educational content as 4.7 out of 5. “The farmer-promoters, participants in the ELTI Leadership Program, are being mentored by the Photosynthesis Institute/DSAF in partnership with ELTI-IPÊ to develop their demonstration units. Prado is cultivating an agroforestry system with essential oil-producing plants such as *Melaleuca alternifolia*, *Xylopiia sericea*, and *Eugenia uniflora* alongside arrowroot, corn, and green manure. Santos and Mangueira are managing an agroforestry system focused on fruit and timber production along with vegetable production, which they are currently transitioning to organic practices.

For more information, email Maria Otávia Crepaldi at mariaotavia.crepaldi@yale.edu.

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