



# ATSAF - CGIAR++ Junior Scientists Program Final Report

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**Country: Indonesia**

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**Start and end date of stay at IARC: 17 Mar 2023 – 17 Sept 2023**

**Title: Modeling Agroforestry Systems through Decision Systems and a Discrete Choice Experiment in The Cultivated Peatlands in Indonesia**

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As a participant in the Junior Scientist Program, I had the privilege of collaborating with various experienced experts, especially with the PEAT-IMPACTS team funded by IKI Germany at CIFOR-ICRAF in Bogor, Indonesia. My supervisor throughout this experience was Dr. Sonya Dewi, currently responsible as the Director of ICRAF Asia. This opportunity allowed me to establish strong connections with team members across various levels, from field officers to senior researchers.

My journey began with a warm welcome from the CIFOR-ICRAF team. In the first week of my arrival, I had the opportunity to present my research ideas to the entire team, receiving valuable feedback and suggestions. Generally, in the first month, I was involved in extensive discussions and brainstorming sessions with the team to gain insights into the ongoing activities and objectives of the project. To learn about data and reports that have been done so far. As my supervisor, Dr. Sonya was pivotal in facilitating my integration into the project. She connected me with the project team leader and introduced me to local team members. This prepared me to collect data, support, and coordinate effectively with the field teams. Regarding administrative things, she quickly approved and signed any required forms and shared contact persons and institutions within Indonesia.

The initial phase of my work involved adapting and refining my project design based on the insights gained from discussions with the CIFOR-ICRAF team. This preliminary step was critical in aligning my research with the organization's objectives and the society's particular challenges in the South Sumatra peatland ecosystem. After the preparation was ready, I moved to Palembang City, where the provincial office of CIFOR-ICRAF is located for the South Sumatra program. David, as the provincial coordinator for PEAT-IMPACTS, gave me an overview of the behavior and culture of society in the place where I will collect some data.

I have to collect data from three villages: Baru, Lebung Itam, and Rambai. I was accompanied by one research assistant who assisted me throughout my investigation, especially given the local language barrier. My experience focused on fieldwork in South Sumatra. I spent around two months actively collecting data in these villages while



keeping open lines of communication with stakeholders, particularly the farmers taking part in the field trial. I interviewed 196 farmers, specifically regarding the sites' socio-economic aspects and preferences for agroforestry systems. Following data collection, a necessary step was converting and cleansing the data to ensure its suitability for subsequent analysis. I dedicated around one month to data cleaning, analysis, simulation, and visualization tasks. Afterward, it is necessary for me to deliver a presentation of my initial findings to the research team and solicit their feedback in order to move forward with my investigation.

My research focuses on "Modeling Agroforestry Systems through Decision Analysis and a Discrete Choice Experiment in the Cultivated Peatland Ecosystems in South Sumatra, Indonesia." The main objective of this study was to evaluate the feasibility of several agroforestry models in the context of farming practices in cultivated peatlands. Additionally, this study aims to identify the elements that influence adopting agroforestry practices. The last objective of this study is to determine the extent to which farmers can be incentivized to transition from monoculture farming practices to agroforestry systems by assessing their willingness to pay.

For this purpose, five distinct agroforestry models were established, each designed to simulate cash flow, net present value (NPV), and variables of importance (VIP). Among these models, two were based on rice agroforestry, while the remaining three were centered on rubber-based agroforestry.

My research showed that the profitability of the coconut-maize rice agroforestry model was lower than that of rice monoculture due to the greater establishment costs required. On the other hand, the areca nut-maize-rice agroforestry concept evolved as a more profitable alternative. In the domain of rubber-based agroforestry, the rubber-durian-areca model exhibited a greater likelihood of generating NPV than rubber monoculture. Similarly, the Rubber-Parkia s.- Archidendron j. agroforestry proved to be a promising alternative to rubber monoculture. The agroforestry model consisting of Sondirum k.- Archidendron j.-Rubber also generated slightly improved outputs, primarily due to the additional income it generated at the end of its cycle.



Furthermore, my research has uncovered the significant impact of factors such as land size, education level, farm distance, and family income on farmers' adoption of agroforestry practices. These variables shed light on the larger socioeconomic backdrop that influences the acceptability and integration of agroforestry practices into the agricultural landscape. Additionally, my study revealed an intriguing insight regarding farmers' willingness to pay for converting the monoculture system to agroforestry. The findings indicate that farmers are willing to allocate about 10 million rupiahs for converting their existing monoculture systems into agroforestry, underlying their recognition of the potential benefits offered by such practices. Moreover, gender also played a crucial role in determining WTP. In this objective, I used a choice experiment to obtain the WTP value.

As I move forward, I am preparing to defend my research, targeted for November 2023. I am actively seeking consultation and feedback to ensure the thorough improvement of my findings and the presentation of a comprehensive result under Prof. Eike Luedeling, Dr. Sonya Dewi, and the PEAT-IMPACTS team.

To sum up, my time in Indonesia has been exceptionally rewarding, allowing me to collect essential data and immerse myself in the intricate world of agroforestry practices. During this period, I had the privilege of exploring the captivating landscapes of South Sumatra alongside the CIFOR-ICRAF teams, providing me with invaluable insights into the region's agroforestry practices. The experience has been incredibly enriching, as I had the opportunity to collaborate with ICRAF teams, farmers, and individuals who share a profound passion and experience for sustainable agroforestry practices. Thanks to ATSAF for allowing me to get this fantastic experience in Indonesia.

Warm regards,

**Erlangga**

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