



Partnership for Sustainable Agroforestry (PSAF) project

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CIRAD long-term adaptive research programme to support and underpin the implementation of PSAF in Timor-Leste

Final activity report (December 2019-June 2022)



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Implemented by



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1 PROJECT OBJECTIVES AND CHALLENGES

The systematic promotion of agroforestry systems in Timor-Leste is rather new. It was important that an adequate basis of both demonstration and applied research and development (R&D) was established in order to ensure sound production, processing and marketing practices (CIRAD, 2019 and Peltier *et al.*, 2020). This referred especially to the identification and development of suitable, sustainable and profitable agroforestry value chains, associated agroforestry systems, management and marketing practices. The Ai ba Futuru – Partnership for Sustainable Agroforestry (PSAF) project¹ works specifically on the promotion of sustainable agroforestry in Timor-Leste. Associated to this project, CIRAD implemented a long-term adaptive research programme to support and underpin the implementation of PSAF.

Two topics for research were selected, related to ecological benefits from agroforestry systems as well as socio-economic impacts, and the implications of both for resilience building towards the impacts of climate change. Technical and governance recommendations have been made to promote agroforestry nationwide, which have been included into the MAF extension material as well as to contribute to long-term forestry sector policy and decision-making (they have been included in the development of Timor-Leste's first Agroforestry Strategy).

Specifically, research results have contributed to:

- The identification of constraints limiting increase in production, income and/or employment from agroforestry systems and related value chains;
- The identification of immediate/short-term socio-ecological benefits from the establishment/expansion of agroforestry production systems;
- Provide training, theoretical framework and analysis of existing systems to adapt the agroforestry strategy to the socio-environmental condition of Timor-Leste. This was done through **regular contact** with the inhabitants of the different villages studied in order to understand their own logic, to mutually **adapt the semantics** of the agroforestry concept in order to understand its different forms as well as the avenues for its development via the highlighting of the constraints and benefits brought by the systems already set up. A prolonged partnership with the UNTL university has made it possible to **share teaching tools** through the collective supervision of students, in particular semi-directive interview methods (participation in the implementation of an interview guide, how to ask questions and process information, develop active listening), a new learning module on GIS, participatory and inventory methods (taking GPS points and transferring them to QGIS software, application, references on agroforestry and AFS typology, meeting event and participatory mapping considering different group of people, new measuring equipment). Finally CIRAD **communicated publicly** (Agroforestry Fair) **and formally** (Technical reports, suggestion to MAF's draft on AF Strategy and participation to AF Strategy meeting, writing of a synthetic

¹ <https://www.giz.de/en/worldwide/70499.html>

document on Agroforestry Strategy) **our recommendations** to the services in charge of the development programme (Ministry agents) and its implementation (State technicians), considering our research results.

One of the activities of CIRAD's scientific team consisted in a technical, ecological and socio-economic diagnosis of current and future agroforestry systems.

In 2018, the agrarian systems of the 4 municipalities of Timor-Leste, where GIZ implements the PSAF project, were poorly understood. For instance, the technical document that was used to set the PSAF (Butterworth & Kielwein, 2018) hardly mentioned traditional agroforestry systems and only products that come either from cultivated fields, forests or rangelands are described. However, if we refer to the description of the agrarian systems commonly used by the scientific community, in particular by ICRAF, and more specifically by NAIR (1985 and 2021), the majority of the cultivated land of the sampled 4 municipalities falls into different categories of agroforestry systems (including sylvopastoral areas).

In order to better meet the needs of the rural and urban populations of Timor-Leste, it is essential to fully understand the functioning of the main types of agrarian systems that can be described. The division of each farm's activities in several types of cropping systems needs to be taken into account, including agroforestry systems with dense cover (with tubers in understory), with light cover (with cereals and legumes in understory), totally open fields (cereals or legumes), mono-specific orchards, forest plantations, pastures with hedges and tree cover or not, etc. These systems have to be placed in the context of a historical evolution, taking into account the traditions of the first known masters of the land, the current ethno-linguistic group, the contributions of the colonizers, state services, various projects and, finally, current economic conditions of the managers of the system: elderly or young person, with or without labor, with or without extra-agricultural income (pension, transfers from city dwellers or expatriates (remittances), etc.). These systems will also have to be located in relation to landscape transects, taking into account the type of soil, altitude, rainfall and the supply of groundwater or irrigation.

From an operational point of view, the project was significantly hampered by the international Covid crisis that started a few months after the junior expert settled down in Timor-Leste. As a consequence, most scientific-support missions from France and Indonesia were cancelled and our planned activities were partly delayed. This situation justified the extension of this project that was firstly revised in May 2021, and then extended (with no change in budget) to June 2022.

2 QUARTER 1 (DECEMBER 2019 - MARCH 2020) OVERVIEW OF AI BA FUTURU PROJECT FOR RESEARCH INCLUSION AND COVID TURBULENCES

From 15 December 2019 to 24 January 2020, a junior expert (Marguerite Cogné) employed by CIRAD started her initial contract of 1.5 years to manage ground studies for Ai ba Futuru project in Timor-Leste. On the first month before departure, she prepared the expatriation (i.e. contract logistics, meeting organization with Cirad team at Forest and Societies research unit in Montpellier, France, reviewing of literature). She arrived on the 16th January in Dili (Timor-Leste) where a first meeting with GIZ was held. Another meeting with the local representation of the European Union (EU) took place in order to update the recent project progress. She was given several reports to update her knowledge of the project and the various partners involved.

From 25 January 2020 to 7 February 2020, a team of CIRAD researchers, Alain Rival and Régis Peltier, carried out a first mission in support of the Ai ba Futuru project in the municipalities of Manatuto, Viqueque, Lospalos and Baucau. During this mission, a meeting with the EU and GIZ officials for the Ai ba Futuru project was held. The team also met with GIZ subcontractor in Baucau, i.e. GOPA, that helped them to visit several farmers and nurserymen involved in the project. Back in Dili on the 5th of February, a meeting with representatives from UNTL², UNITAL³ and ETCI⁴ was also organized to initiate potential partnerships for the coordination of student internships. Following this mission, a report was drafted and sent to GIZ in March 2020.

From 8 February 2020 to 15 March 2020: the junior expert dealt with a number of logistical issues, including permanent accommodation and transport in the municipality of Baucau. She also recruited a translator-facilitator for the field visits. During the first few months, she was occasionally accommodated in the GOPA offices to carry out her writing and bibliographic reviews.

After the first field visit in January, because of logistic and field sample, CIRAD researcher and the junior-expert decided that it was better to focus on Baucau district to undergo a first description of agroforestry systems in the eastern region of Timor-Leste.

Field interviews were conducted in the different administrative post of Baucau municipality where the project was taking place (Baucau Vila, Venilale, Baguia, Quelicai). The suco⁵ of Osso Ala in Vemasse and Atelari in Baguia were not visited at that time of the year because of time limitation and low transport means in rainy seasons. The main subject of these field visits were to collect information about history and landscape organization in the municipality of Baucau, according to the methods described in the report (cf. report November 2020).

On 15 March 2020: GIZ colleague working in Baucau advises Marguerite to come back to Dili because rumours about COVID19 are starting to spread around the country.

² Universidade Nasional Timor Lorosa'e

³ Universidade Oriental Timor Lorosa'e

⁴ East Timor Coffee Institute

⁵ Administrative district that encompasses 3 to 10 villages together

On 17 March 2020: Arrival of Marguerite in Dili. The cooperation attachée for French ministry of foreign affairs (Estelle Duluc) and the GIZ junior-adviser (Rebecca Raeppe) inform her about ongoing situation in Dili and medical tests for COVID19 that are not yet confirmed. She decides to stay in Dili in order to be quickly updated and start to process data (mapping, resume of interviews...).

From 20 to 22 March 2020: First COVID19 confirmed in Dili. All seats for the Singapore flight 22nd of March were booked. Indonesia closed its border on 20th of March and requires new visa to transit with restricted measure (including covid test not available in Timor-Leste).

On 23 March 2020: the junior expert caught dengue and took a sick leave.

3 QUARTER 2 (APRIL TO JUNE 2020) INTERACTIONS WITH THE MULTI-DISCIPLINARY TEAM IN MONTPELLIER

On 3 April 2020 Marguerite took her repatriation flight to Portugal.

From 4 April to 28 May 2020: obligatory confinement in France. After sick leave, the junior expert reviewed field data for analysis.

On 29 May 2020: presentation of Ai ba Futuru project to CIRAD Research Unit “Forest and Societies”, in Montpellier, France.

June 2020: the expert junior met with several CIRAD researchers to organize a multi-disciplinary team on soils, carbon and socio-economic sciences as well as experts in mapping, modelling and agroforestry. Finally, a core team of 7 researchers (M. Boissiere, V. Freycon, A. Akodéwou, M. Chesne then replaced by C. Pioniot Laroche, P. Degenne, E. Penot and A. Thoumazeau) got involved in the project, in addition to the main project managers (G. Lescuyer and R. Peltier). Their task is to follow the methods and result interpretation of the research in Timor-Leste. Among the team, 5 of them (V. Freycon, R. Peltier, G. Lescuyer, M. Boissière, And E. Penot) were interested in participating in ground mission. The team was divided in 2 « sub-topic » teams:

- **Socio-economic:** M. Boissière, E. Penot, P. Degenne (mapping and modelling) and G. Lescuyer;
- **Soil sciences, biodiversity and carbon biomass sequestration:** V. Freycon, M. Chesne, A. Akodéwou, A. Thoumazeau and R. Peltier.

4 QUARTER 3 (JULY TO SEPTEMBER 2020) ORGANIZATION OF THE MULTI-DISCIPLINARY TEAM IN MONTPELLIER THEN RETURN IN TIMOR-LESTE

From 1 July to 17 August 2020: With each sub-topic team, the junior-expert started to formulate the specific objectives of the research considering the means available in Timor-Leste. She planned fieldwork organization as well as the integration of internship topic for future Timorese students who would be integrated into the research. She also started to select and book specific material for soil analysis with V. Freycon (soil specialist). She also organized with the CIRAD Regional Director of South East Asia (A. Rival) the logistic means to go back to Timor with WFP flight in August (17-18th) and quarantine on arrival.

On 18 of August 2020: arrival in Dili, quarantine for 17 days. Junior expert reviewed references, wrote internship proposals for Timorese university students and a French master student and planned activities for the next months.

September 2020: After quarantine, meeting with GIZ to present the first research results and the research plan, as well as request for contract extension possibilities due to Covid delays. The junior expert also met Pr. Marcal Gusmao, the responsible for Agriculture and Climate Change department at UNTL who agreed to build a partnership with CIRAD, involving student internships to conduct research in Baucau for the year 2021. Junior expert met the UNTL representative for Cooperation department with Pr. Marcal Gusmao to present the research project.

5 QUARTER 4 (OCTOBER TO DECEMBER 2020) RE-ORGANISATION OF THE RESEARCH PROJECT

October to November 2020: the junior expert completed field studies in Baucau in Ai ba Futuru targeted *suco* that were not visited yet in March 2020 and did additional interviews to improve the understanding on the main production systems present in Baucau. She also drew a first typology of the traditional agroforestry systems (AFS) in this region. An intermediary report to explain the research methodology, first results and plan for further research was sent to GIZ Dili-office on the 17th of November. The formulation of a MoU to regularise the CIRAD-UNTL partnership was also drafted by Alain Rival and Marguerite Cogné.

December 2020: presentation and discussion in several villages of Baucau were organized to explain the research objectives and first results on agroforestry systems found in the district. M. Cogné also discussed about agroforestry concepts and how farmer perceive the AFS typology that was sketched in order to improve it.

6 QUARTER 5 (JANUARY TO MARCH 2021) PREPARATION OF FIELD WORK AND STUDENT INTERNSHIPS

January 2021: The junior expert received 11 responses to the 4 publications of internship proposals (published on several Facebook groups, through the Pr. Marcal Gusmao and word-of-mouth). Two were from girls who did not attend the interviews, despite being offered a postponement. In total, 4 male trainees were selected, 3 from UNTL and 1 from UNDIL (Universidade de Dili). One person was also hired to carry out 2 weeks of botanical fieldwork with the junior expert. A French master student from the Agronomic School of Montpellier was also hired to do an internship in pair with a Timorese student to represent AFS within a village terroir (participatory mapping) and decipher their socio-economic functions as perceived by the villagers.

February 2021: The junior expert and the Timorese junior botanist hired in January experimented together « self-made protocols » (need for descriptive sheets and maps with GPS points), field inventories of all vegetation layer (herbaceous, creeper, shrubs, young and mature trees) in several agroforestry plot of Gariuai *suco* to understand the function of AFS and improve the AFS typology. The purpose of these inventories was also to select future farm plots for the future student internships. Other prospective inventories were done in Samalari *suco* to select farm plots and prepare internship protocols.

March 2021: Inventory data process and analysis was done together with the remote CIRAD research team. The AFS typology was improved (identified species and their functions). The students' internship has been planned: preparation of protocols and meetings with UNTL teachers and students, logistics management such as transport, accommodation, tools for soil, mapping and biomass measurements arriving from France and to be bought in Timor-Leste, teaching aids for students including individual literature, review on agroforestry concepts and on their study subject (1 per student). During this preparation, the junior expert also met the new GOPA mapping expert who arrived in Baucau to conduct Participative Land Use Mapping in order to coordinate the work of his team with CIRAD research.

7 QUARTER 6 (APRIL TO JUNE 2021) FIELD RESEARCH

April 2021: Because of Covid restrictions and fear spreading in the country at that time, one of the student selected cancelled his application. The junior expert selected another student to participate in mapping and social function of AFS workshops (in pairs with the French intern).

12th April 2021: A meeting with the two Cirad teams was set up to update the AFS typology results from inventories and to revise the operational plan to achieve GIZ and CIRAD objectives within Ai ba Futuru project. The presentation was communicated to GIZ team in Dili with sheets describing the particularities of each AFS and illustrated with

photos. These outputs were used to draft an addendum of the grant from GIZ to CIRAD, with a minor increase in the budget.

30th of April 2021: CNIC⁶, UNTL, GIZ and CIRAD representatives met to concretise the MoU partnership between CIRAD and UNTL as delays had been taken in the signature of the documents due to the change of persons responsible for the UNTL management between 2020 and 2021, and the administrative disruptions due to Covid.

After several logistic problems due to Covid restriction in the country, all Timorese students arrived in Baucau in the end of April.

May 2021: The Timorese students were welcomed in Baucau and they received a methodological refresher course: agroforestry concepts and joint presentation of their individual bibliographical work, presentation of the context and initial results of the research, landscape study in the *suco* targeted (Gariuai and Samalari) to familiarise themselves with the field work and identify the AFS, test of the interview guides with general semi-directive surveys on the production systems, test of the study material and protocols for the various training courses.

The French student arrived in Dili and the junior-expert supervised his obligatory quarantine.

The addendum to the grant was signed by GIZ and CIRAD. It extended CIRAD activities until February 2022, and so was the junior expert's contract.

June 2021: The French trainee arrived in the field and was integrated into the Timorese student team (joint presentation of the traineeships and progress of the first weeks of the TL traineeship). Initial work included: meetings to present the internships in the study sites in Baucau (Samalari and Gariuai *suco*) and fieldwork: biomass inventories and soil sampling in 30 farm plots, semi-directive surveys (economic characterisation of agroforestry systems), participatory mapping and PDM (Peeble Distribution Methods) workshops, GPS data collection.

8 QUARTER 7 (JULY TO SEPTEMBER 2021) FIELD RESEARCH AND JUNIOR EXPERT RETURN TO FRANCE

From July to August 2021: The fieldwork continued as follows: biomass inventories and soil sampling, semi-directive surveys (economic characterisation of agroforestry systems), participatory mapping and PDM (Peeble Distribution Methods) workshops, field cross-checked with GPS. The junior expert supervised the students on the field, for result interpretation and field logistics requirement (material, transport). The team organized

⁶ Centro Nacional de Investigação Científica

regular group meeting (each week) to update each other on the new information collected in the field and adjust the research plan to the objectives.

A visit from UNTL teachers to follow their students on the field was cancelled due to per diem amount misunderstanding (amount of the budget too low according to the national standards).

Visit from CIRAD experts to guide the students on the field (2 mission planned) were cancelled due to COVID aerial transport restriction in Timor-Leste. However, regular meetings with CIRAD remote research team in France were scheduled to support the junior-expert on field supervision.

September 2021: Return to France for the junior expert and the French student. Meetings with CIRAD team in France provided direct updates on the fieldwork and to organize data analysis for technical reports.

9 QUARTER 8 (OCTOBER TO DECEMBER 2021) JUNIOR EXPERT RETURN TO TIMOR-LESTE, AND DATA ANALYSIS

October 2021: After the quarantine in Dili, the junior expert participated to an update meeting with GIZ team in Dili. As a continuation, she organised the following activities: i) Meeting with UNTL student supervisor (Pr. Marcal Gusmao) for the writing of the students' reports (instructions given in August to the students); ii) Processing and analysis of internship data; iii) Accompaniment of the French student master thesis and Timorese students' internship reports; iiiii) Preparation of soil and biomass field mission with V. Freycon and R. Peltier.

November 2021: Processing and analysis of internship data, and master thesis defence. Cancellation of soil and biomass mission due to Covid restriction travel in Timor-Leste. Preparation of the mission to extend SAF diagnosis to the 3 other municipalities of the project (Manatuto, Viqueque, Lospalos) scheduled for January 2022.

December 2021: End of data analysis and presentation of the main research results with CIRAD remote team in France. Preparation of the AFS extension diagnostic mission (logistics: recruitment of translators, visits to target areas, transport, equipment). Results are reported in Samalari (restitution of the map to the inhabitants of Osso Luga). The same workshop was cancelled in Gariuai (coordination problem with local authorities).

10 QUARTER 9 (JANUARY TO MARCH 2022) CIRAD MISSION, RESEARCH RESULTS ANALYSIS AND COMMUNICATION IN TIMOR-LESTE

January (6th to 27th) 2022: The CIRAD mission of G. Lescuyer and S. Mazin took place for 2.5 weeks (landscape characterisation, historical and production system surveys, basic necessities surveys, rapid inventory of tree biodiversity in AFS and general soil observations, presentation-discussion workshops with inhabitants before and after the ground study in the village). The first results of the mission were reported to GIZ before the departure of the experts.

February 2022: Data processing and analysis of January mission. The technical report was written with the Cirad remote team in France (biomass and soil, socio-economic). The research results were presented by the junior expert at the Agroforestry Fair organised by GIZ on the 26th of February.

A no-cost extension of the project was agreed between GIZ and CIRAD to have more time to finalise the remaining activities until June 2022 instead of February 2022.



March 2022: The draft technical reports were reported to GIZ team in Dili. On the 14th of March, a seminar was organized at UNTL (agriculture, animal health and socio-economic department, GIZ, EU and French Institute representatives invited) to present the research results with two of the Timorese trainees who participated in the study in 2021.

11 QUARTER 10 (APRIL TO JUNE 2022)

April 2022: Junior expert left Timor-Leste and returned to Cirad office, Montpellier, France. A short-term contract between CIRAD and the junior expert was signed from 1 April to 30 June 2022.

From May to June 2022: The technical reports were completed and recommendations for the "Agroforestry Strategy" were written. Two scientific papers were prepared. A poster is proposed at the international congress in Quebec, Canada. It was then presented by R. Peltier, on 18 July 2022. It was awarded the prize for the best poster in the theme "Agroforestry for tropical mountain areas".

12 DELIVERY OF THE PLANNED OUTPUTS

	Expected outputs	Delivered outputs
<i>Activity 1: A preliminary analysis of the scientific needs and capacities of PSAF stakeholders</i>		
	Report including: (1) Literature review and consultations with stakeholders, (2) Accurate and reasoned definition of research questions, (3) engagement strategy with national educational/scientific partners	PELTIER R., RIVAL A., COGNE M., 2020. Short-term mission for the long-term adaptive research project take-off (January 24th to February 8th). Cirad-GIZ, March 2020, Dili and Montpellier
		Powerpoint presentation by Marguerite Cogné on May 29, 2020: "A summary of the work carried out in the district of Baucau from February to March 2020 and a proposal for further research"
<i>Activity 2: A technical, ecological and socio-economic diagnosis of agroforestry systems in the Baucau region</i>		
	A report covering: (1) The current socio-ecological and agronomic performance of selected agroforestry systems in Baucau; (2) Main agroforestry constraints in Baucau; (3) Recommendations to lift the identified constraints and meet stakeholders' expectations; (4) Short, medium and long-term assessment of expected benefits, if constraints were lifted	Technical report on "Soil, Biodiversity and Biomass of Agroforestry Systems in Baucau area" by Cogné et al. (2022). Technical report on "Socio-economic functions of Agroforestry Systems in Baucau area" by Cogné et al. (2022)
	Technical reports: (1) 4 reports by the junior scientist and international experts; (2) 4 reports by BSc students or young graduates.	4 reports by the Timorese and French interns (2021)
<i>Activity 3: A study of the possibilities of extrapolating the results drawn up in Baucau to the other PSAF selected districts</i>		

	An assessment report of the contribution of the research-support program to the development of sustainable, resilient and profitable local livelihoods through agroforestry for the 4 districts of Baucau, Lautem, Manatuto, and Viqueque	Mazin S., Lescuyer G., Cogné M., Péroches A., 2022. Diagnosis of agroforestry and farming systems in Manatuto, Viqueque and Lautem districts, and comparison with the Baucau district. CIRAD long-term adaptive research programme to the Partnership for Sustainable Agroforestry (PSAF) - Ai Ba Futuru project, Dili, Timor-Leste
	Educational material for farmers aimed at promoting agroforestry systems adapted to the Timorese agroclimatic conditions	PPT presentations to the fair organised by GIZ, and for a seminar at UNTL. Poster at the World Agroforestry Congress 2022
	Introduction of these materials in 4 workshops with farmer and institutional training centres (university or agricultural school)	
	Recommendations for the MAF	Recommandations "A strategy for Agroforestry in Timor-Leste" by Cogné et al. (2022)

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