FORSEA Project

Summary report of missions by CIRAD experts to one of the countries in the study area

If mission with multiple destinations, draft one report per country
If mission with several experts, draft only one report for all the experts

I. NAME(S) OF THE EXPERT(S):

- Eric Penot, UMR Innovation CIRAD

II. DATES OF THE MISSION:

From 02-- /10--/2023- to 08--/10--/2023-

III. COUNTRY VISITED (one choice, highlight name in bold and delete other flags)

- CAMBODIA

IV. WORKPACKAGE(S) OF CONCERN

(multiple choices, strikethrough and delete symbols for the others)

- WP4 Innovation for Adaptation to Climate Change (WP4.1)

V. MAIN OBJECTIVES OF THE MISSION

- **Discussion of agroforestry patterns with CRRI**
- **Discussion with farmers of potential agroforestry patterns in Mondulkiri Province**

VI. SUMMARY OF ACTIVITIES (free text, no space limit)

The same objective ware for the 2 meetings.

Meeting 1 with CRRI (2/10/2023)

A meeting was organized in CRRI Head Office Phnom Penh to discuss the possibilities of implementation of permanent agroforestry systems in Cambodia and their potential to favor adaptation to Climate Change and Climate marginality. GDR, RUA, WWF were invited to participate but only WWF could join the meeting. The agenda of the meeting was as follows: "Presentation of agroforestry options and patterns in the world".

* Discussion and selection of crops to be associated and patterns: In particular the double- spacing design to limit the number of trees/ha to comply with climatic constraints and limit risk of water competition. Various options have been discussed to frame what could be done in terms of agroforestry patterns.

Double-spacing patterns with maximum 550 trees (rubber and associated fruit/timber trees). These designs will be then discussed with local farmers.

CRRI mentioned their opinion about the difficulty for farmers to accept to decrease their rubber planting density below 555 rubber trees per hectare, the standard planting density of rubber monoculture in Cambodia.

Meeting2 / Focus group with local rubber farmers in Mondulkiri in O arm village, Sre Kthum commune, Keo Seiwa district.

Many farmers do practice intercropping with rubber in immature period with food crops (upland rice, mais, peanut, …) or pluriannual crops such as pineapple and banana. But for all farmers in Cambodia, there is no agroforestry practices during mature period as most of these farmers have worked in large estates, or have been trained for monoculture.

Agroforestry patterns during mature period enable income diversification and a better economic resilience in particular facing volatile and low rubber price.

We decided initially to focus only on potential agroforestry patterns during mature period using only double-spacing patterns.

The focus group wad implemented with 20 farmers (including 3 women) selected by WWF in Mondulkiri area with great animation By Mrs Kheang Sokleng from WWF. 4 groups were created to discuss AF patterns. We ended up with 2 types of groups:

- group 1: farmers want to keep the current 6m*3m traditional rubber planting design and are looking only for crops that can be implemented today in plantations between 12 and 25 years old. The condition is that maximum shade can be 70 % either with clone such as RRIM 600 or with plantations with leaf diseases. Some farmers have already planted pineaple on 1 line in the rubber inter-row with 1 plant every meters. Most fruits are self-consumed but some are sold 1 US$/fruit. Such design can produce a value of (gross product) 1500 US/year/ha, almost equivalent to rubber production in itself. Pineaple is considered as the best bet alternative for such simple agroforestry systems. The farmers who did not initiate agroforestry are interested by curcuma/turmeric, cardamom and pepper, eventually some animals (chicken, pigs, fish). Some annual crops could be grown at low intensity (with low productivity) in the middle of the inter-rows to feed the animals

-Group 2: these farmers intend to plant new rubber with the new design: double spacing : 3 lines of rubber at 3 * 3 * 3 with a wide spacing of 20 meters leading to almost 400 rubber trees in order to limit the drop of rubber production /ha to 10 % only . In that case they intend to heva one line in the inter-rows with trees such as durian, soursop, gaharu/agar tree and potentially local timber trees. In between, could be grown such roots/cassava, pepper, banana and pineapple and then after 20 years when the rubber canopy is more and more developed, turmeric and cardamom. Farmers did understand very well the necessity to adapt to more and more shade with time in the rubber inter-row.

So, we identified 2 groups with a different strategy:

-a conservative approach with the current design mainly with pineapple and/or spices adapted to shade (10 farmers)
-An innovative group (10 farmers) ready to try and adopt the double spacing design for new planting with crops adapted to sun in the interrow and shade after rubber canopy increase shade.
Pineaple and banana would be planted at 1 * 1, pepper at 1 * 2 on the line. 150 associated trees could be planted on the inter-rows with a total of 4 lines /ha with associated tree planted every 11 meters. With such design, we have a maximum of 550 trees/ha (rubber and associated trees). We do know how many other plants we can associate in such design to occupy the rest of the interrow without having water competition with rubber. On farm trials with various patterns would be necessary to identify the best patterns.

This preliminary focus group analysis provides evidence of interest for farmers to various types of AF designs including the “revolutionary double-spacing system” which is rather new for local farmers. It could be very interesting to develop a network of on farm trials using participatory approach with selected farmers in order to test various AF alternatives.
Even if current AF practices are not developed currently during mature period in Cambodia, it seems that some farmers are interested to AF patterns adapted to local soil and climate conditions.

Beside a better economic resilience and income diversification (as observed in other countries), one main question is the real impact or contribution of agroforestry practices during mature period (in the long run) to mitigate climatic change and adapt to climatic constraints. Developing on-farm trials with local farmers and at least monitoring of any agroforestry practice developed in the very next future by local farmers seems necessary to collect information on that topic, either though planting associated crops in an extensive way in current existing plantation (with normal planting density) or with new planting in double spacing patterns.

We would like to express our thanks to Mrs Kheang Sokleng from WWF for her invitation, focus group organisation and great help in the animation.

VII. **ILLUSTRATIONS** (pictures with a brief legend and credits)

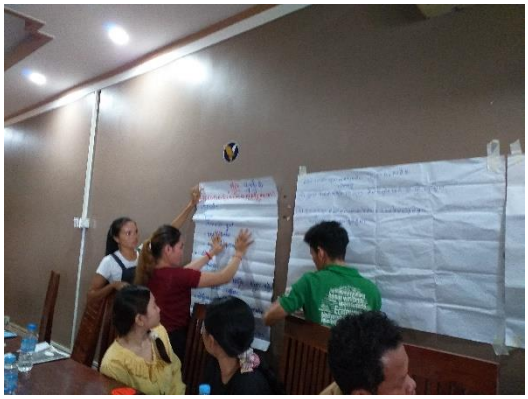
General presentation of RAS patterns during mature period of rubber in the world to CRRI and discussion about options and patterns/design

CRRI : what innovation at stake…..

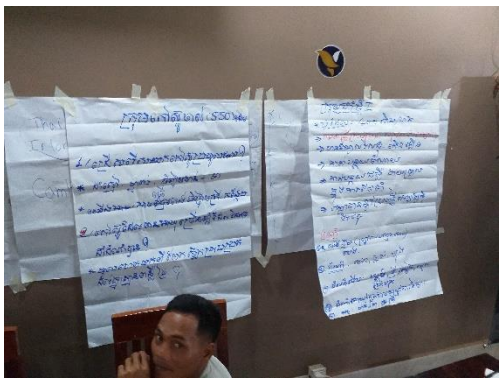
VIII.

General presentation of RAS patterns during mature period of rubber to local farmers

Small groups discussions about RAS patterns and designs



Presentation of farmers small groups discussions on RAS patterns during mature period of rubber to the entire group of local farmers



The results of discussions of small groups discussions on RAS patterns during mature period of rubber

Global discussion on RAS patterns

The complete group of 20 farmers

Small farmers groups discussions in the field about RAS patterns during mature period of rubber the interest to grow on the inter-row some pineapple with shadow at 70 %

IX.

Current stage of 15 years old rubber plantation with some leaf disease and an estimated 70 % shadow that allows to grow extensive pineapple on one line in the rubber inter-row

18 years old rubber plantation with extensive pineapple on one line in the rubber inter-row at 1 meter between each plant on the line.

Production 1500 kg/ha/year

X. SCHEDULE OF THE MISSION

DATE	PLACE	DECSRIPTION
2/10/2023	Phnom Penh	Meeting with CRRI
3/10 to 5/10/2023	Mondulkiri area	Meeting /focus group with local farmers
5/10/2023	Phnom Penh	Wrap up meeting with AFD, Phnom Penh office

XI. PEOPLE MET

Name	Institution	Position
Mrs Kheang Sokleng	WWF	
Mr Lim Khan Tiva	CRRI	Director of CRRI
Mr Phen Phearun	CRRI	CRRI Researcher, Head of Latex harvesting and Physiology division
Mr Phean Chetha	CRRI	CRRI Researcher, Head of breeding division
Dr Eric Gohet	CIRAD	CIRAD researcher, Coordinator of the FORSEA Project
Mr Muong Sideth	AFD	Project Officer Agriculture, rural development, environment
Ms Tilia Guérin-Calmettes	AFD	Project officer Agriculture, rural development and biodiversity & CSO partnership