

# HRPP

## Rubber farming in Southeast Asia



- Mobilizing multidisciplinary approaches to help Southeast Asian countries transition towards sustainable rubber production
- Supporting the adaptation of family rubber farms to global changes
- Strengthening regional partnership on common challenges in the rubber supply chain

*A platform in partnership for research and training (dP in French) is a long-term strategic alliance made up of a critical mass of partners and researchers around a shared program and portfolio of projects. Managed collectively, the Platform is open to members of civil society to facilitate its impact and also interacts with public policy decision makers in order to generate changes and transformations.*



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The global industry depends on millions of family farms for a particular raw material—natural rubber (NR). Mainly cultivated in tropical Asia, rubber farming faces changes in its context of production due to climate change, a decrease in labour availability and increasing environmental concerns that are leading to new regulatory systems and requirements from the market. Family rubber farms face new challenges and must adapt.

Established in Thailand with a regional opening (Cambodia), the “Hevea Research Platform in Partnership” (HRPP) covers a wide range of agro-biophysical and socio-economic conditions and allows the development of an integrated multi-disciplinary approach of these questions.

### ■ HRPP IN A NUTSHELL

- Created in 2008
- 20 partners institutions in 2023, including 4 core members, 7 associated members and 9 partners with joint research collaboration
- 40 researchers actively involved in the activities
- Around 25 academic staff
- 5 PhD students in January 2023
- 4-16 publications per year (in journals)



### ■ ASSOCIATED MEMBERS

**Universities:** Khon Kaen University (KKU, Thailand), University Blaise Pascal (UBP, France)

**Research centres:** The National Center for Genetic Engineering and Biotechnology (BIOTEC, Thailand), the Cambodian Rubber Research Institute (CRRI), the French National Research Institute for Agriculture, Food and the Environment (INRAe), the French Research Institute for Development (IRD)

**Private sector:** YARA (producing, distributing and selling nitrogen-based mineral fertilizers and related industrial products)

### ■ CORE MEMBERS



**Kasetsart University (Bangkok)**  
the largest agricultural university in Thailand



**Prince of Songkla University (Hat Yai)**  
The largest university in Southern Thailand, in the heart of the rubber-producing area



**Rubber Authority of Thailand**  
The national research institute for rubber research and development



**Cirad**  
The French agricultural research and cooperation organization working for the sustainable development of tropical and Mediterranean regions

### ■ PARTNERS WITH JOINT RESEARCH COLLABORATION

**Universities:** Thaksin University (TSU, Thailand), Universities of Bordeaux, Haute Alsace, Lorraine, Rennes (France)

**Research and development centres:** the French National Centre for Scientific Research (CNRS, France), Land Development Department (LDD, Thailand)

**Private sector:** several private stakeholders involved in NR transformation



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## ■ BENEFICIARIES

**Local producers** can access technical information to increase and secure their income. They better understand the risks associated to climate change and the possible adaptations.

**National and international organisations** have knowledge, tools and methods to adapt their actions to emerging challenges, both environmental and socio-economic.

**Producers, processors and consumers** get criteria to assess and improve the technological quality and environmental impact of NR.

**Students, executives and researchers** improve their capacities at the different steps of the supply chain, from the farm to processing centre.

**Scientific partners** strengthen their reputations through regular co-publications in international journals.

## ■ EXPERTISE AND TECHNICAL COMPETENCIES

- Latex harvesting systems adapted to clones and types of plantations for a sustainable management of rubber trees
- Diagnosis of latex harvesting systems based on bark consumption (panel diagnosis) and physiological status of laticifers (latex diagnosis, LD). Set up LD laboratories
- Environmental impact of rubber plantations: flux measurement and establishment of carbon footprint and water balance in plantations. Identification and measurement of indicators of soil health
- Multicriteria assessment of the sustainability of rubber systems
- Analysis of the biochemical composition and the structure of NR and latex, establishment and measurement of technological quality indicators
- Study of the drivers of agronomic and post-harvest practices (from latex harvesting to first processing) on NR quality
- Co-valorisation of high value-added molecules extracted from rubber latex
- Diagnosis of productive systems: design and implementation of agro-economic survey and value chain analysis



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## ■ SOME ON-GOING PROJECTS

**Sustainability of family rubber farms in the context of global changes in mainland Southeast Asia • DORAS Rubber - 2022 – 2025, Thailand International Cooperation Agency, TICA, Funding: EUR 0.3 million**

This project, supported by the TICA, provides an institutional status for Cirad staff involved in the HRPP. Its scientific program is closely linked to that of the HRPP and develops a multidisciplinary approach to address the new challenges of rubber cultivation in Southeast Asia (climate, labour, new markets and regulations).

**Forecasting impacts of climate change and workforce availability on natural rubber commodity chain in Southeast Asia (FORSEA) - AFD FEXTE - 2022-2025, Funding: EUR 1.5 million**

This regional project contributes to the adaptation to the challenges of the rubber industry in Cambodia, Thailand and Vietnam. Based on the climate change scenarios established by the GIEC as well as experimentation and modelling work conducted in Cirad Montpellier and target countries, the FORSEA project assesses the vulnerability of rubber trees to climate change and the impacts on their production potential. Based on surveys, it describes the current workforce situation on rubber farms and identifies the factors of change in labour availability. It proposes a prospective analysis of the rubber sector and, based on the scenarios of evolution of climate and workforce, it reviews the technical, social and institutional innovations to face risks induced by the changes.

**Sustainable FuFactive - SEARCA – Agropolis Fondation, 2022-2025, Funding: EUR 0.13 million**

Investigations conducted under the framework of the HRPP on the non-isoprene components of latex in relation to NR quality highlighted the presence of a rare fatty acid in the latex of some rubber clones: furanic acid F2 (FuFA-F2). For health-nutrition applications, a study is conducted as part of a PhD thesis on the agronomic drivers (genotype, latex harvesting, season) of the concentration of this molecule in latex and on the optimisation of its extraction from latex. The study is co-supervised by Montpellier University and Kasetsart University in association with the RAOT and CRRI.

## JOINT LABORATORY UNDER HRPP

Part of the unique properties of NR compared to its synthetic competitors lies in the non-isoprene components in NR. A joint KU-CIRAD laboratory—the Laboratory of Biochemistry and Technology of Natural Rubber (LBTNR)—was set up in 2002 to better understand the nature and influence of proteins and lipids in NR in relation to agricultural practices. Latex diagnosis analyses are also conducted in the laboratory which now hosts different activities of the HRPP and actively contributes to the training of many students.



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