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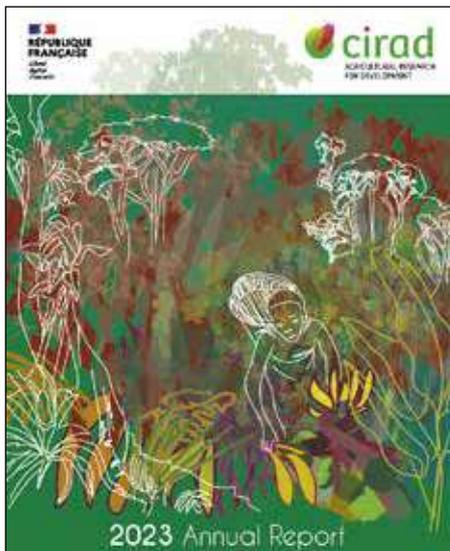


cirad

AGRICULTURAL RESEARCH
FOR DEVELOPMENT



2023 Annual Report



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EDITORIAL

Tropical forests, a key issue for research



One Forest Summit, Three Basins Summit, Amazon Summit and Dialogues, and more... 2023 was an unprecedentedly packed year in terms of events on forests. CIRAD stepped up to the mark at all these events, taking part in meetings, organizing side events to share its knowledge and research results, etc. A special focus in this report looks in detail at this mobilization in favour of sustainable tropical forest development. It also looks back to the launch of a new partnership, the sustainable land use planning programme in Republic of Congo. Through this unprecedentedly large-scale project, CIRAD will be helping the country to plan how its rural land is used. On a European level, new legislation aimed at fighting imported deforestation was adopted in 2023. It includes a much broader definition of forest degradation, including conversion of primary forests or naturally regenerating forests to planted forests. Our researchers' expertise in this field is widely recognized, and both the European Commission and the European Parliament made use of it in drafting the new legislation. Europe also announced additional financial support to help developing countries fight deforestation and promote sustainable farming practices.

Co-construction of CIRAD's strategy for the French overseas regions and the Contract of agreed objectives, means and performance targets (COMP)

In terms of partnerships, we received our partners from the French overseas regions – local authorities, State services – in Montpellier in November along with representatives of four ministries, the Agence française de développement, the Office de développement de l'économie agricole d'outre-mer, ACTA and the French Chambers of Agriculture. The aim was to take stock of our work together, our successes, pinpoint current expectations, and work together to build a roadmap for research to address the issues surrounding environmentally smart agriculture in the overseas regions. 2023 also saw the drafting of our new Contract of agreed objectives, means and performance targets (COMP) with the French State. The new COMP was negotiated throughout the year, and is due to be signed at the Paris International Agricultural Show in February 2024. It means a

three-year commitment for us. At the same time, we revised our scientific partnership strategy, which gave us the chance to take a fresh look at our scientific priorities, and our geographical partnership strategy. That new strategy will be rolled out in 2024.

Gillet report: what are the consequences for CIRAD?

2023 was also the year of the Gillet report on the reform of the French research and higher education ecosystem. CIRAD is in line with its recommendations. It shares a belief in the need to organize better consultation between academic players, to adapt research results to the scale of the socioeconomic world, to include national research organizations in policies in favour of building large sites, to use research to enlighten public decision making and to fund high-risk research. Within the framework of this reform, CIRAD General Management has been proactive, and met with the management bodies of the main six national research organizations that will have research programming agencies (agences de programme). The aim was to discuss the prospects for programmes that would boost the thematic, disciplinary and partnership synergies and complementarities between CIRAD and those organizations..

Salary increases

In house, following lengthy negotiations that began in April, enabling the unions and General Management to set out and adjust their wage proposals, an agreement was reached on a 5% increase in average pay for CIRAD staff. I am delighted with this agreement, which is also the result of General Management's work on the establishment's budgetary framework.

We are moving serenely towards 2024, which will be an important year CIRAD as it marks its 40th anniversary: 40 years of engaged research, for resilient farming systems in a more sustainable, inclusive world. ■

Élisabeth Claverie de Saint Martin,
CIRAD CEO

2023 HIGHLIGHTS

January

19^e Rencontres de virologie végétale

The 19th Plant Virology Meetings, co-organized by CIRAD, were held from 15 to 19 January 2023 in Aussois, France. Since 1987, the meetings have brought together plant virology players from France, to take stock of research progress. They have enabled numerous collaborations between molecular biologists, geneticists, entomologists, epidemiologists, and so on.



VCA4D Project Conference

The Value Chain Analysis for Development (VCA4D) project was launched in 2016 by DG INTPA to support agricultural development in partner countries. It is being implemented by Agrinatura, of which CIRAD is a member, and has conducted 45 studies to support decision making. Its conference, held in Brussels (Belgium) on 18-19 January, looked at transverse thematic issues.



© R. Belmin, CIRAD

Agriculture(s), time for mobilisation

CIRAD took part in this conference organized by the FARM Foundation at the OECD in Paris on 17 January. It brought together the entire range of stakeholders – policymakers, scientists, donors, farmers, students, etc – keen to contribute to the vital changes that must be made to farming and food systems.

February

2023 Paris International Agricultural Show: “Food sovereignty: a (hi)story of diversity”

Fewer than 200 crop species make any substantial contribution to the human diet. Our crops, farm animals and consequently what is on our plate are not very diverse. The CIRAD-AFD joint stand at SIA 2023 addressed the issues surrounding diversity and food sovereignty.

AfriCam project launch

AfriCam, which was officially launched at the Paris International Agricultural Show, is the first project under the umbrella of the Preventing Zoonotic Disease Emergence (PREZODE) initiative. AFD, CIRAD, IRD and their partners are behind this ambitious project to strengthen surveillance and early detection systems in four African countries and Cambodia.



[L to R] CIRAD CEO Elisabeth Clavier de Saint Martin, AFD CEO Rémy Rioux, Deputy Head of Sustainable Development et the Ministry for Europe and Foreign Affairs Clélia Chevrier Kolako, and Head of the Ecology, Biodiversity and Continental Ecosystem Functioning (ECOBIO) Department at IRD Emma Rochelle-Newall © N. Kaden, CIRAD

12th Annual Symposium of the UNESCO World Food Chair

It is often thought that we do not pay the “right” environmental price for our food. It so happens that its social price is not much “fairer”. At its 12th annual symposium in Montpellier on 3 February, the UNESCO World Food Chair, co-held by CIRAD, addressed the issue of labour within farming and food systems.



March

Launch of the French initiative for sustainable bananas (IFBD)

Driven by the shared desire to meet the industry's economic, environmental and social challenges, the main players in the French banana industry decided to team up under a multi-player voluntary initiative for sustainable bananas, launched at the Paris International Agricultural Show. Under the aegis of the French government, the IFBD intends to tackle every aspect of sustainability.



© S. Della Mussia, CIRAD

One Forest Summit

The One Forest Summit, launched at the COP27 climate conference in November 2022, was held in Libreville, Gabon, on 1 and 2 March. It shone the spotlight on the protection and sustainable management of three major forest basins: Congo, the Amazon and Southeast Asia. CIRAD participated, notably through the publication of a position paper entitled "CIRAD is committed to the future of tropical forests".



Army ants in the frontline of a new study

A viral metagenomics study was published in Peer Community Journal. It was conducted by teams from CIRAD, IRD and INRAE, in collaboration with partners from South Africa, the US, Congo and Gabon. This pioneering research used army ants as a means of sampling plant and animal viruses circulating in a tropical forest ecosystem.



© P. Becquard, IRD

April

Results of the Challenge App Afrique competition

Rabeb Fersi, a Tunisian agronomist, was the winner of the 2023 Challenge App Afrique prize, awarded on 11 April for her app Crop's Talk, which boosts smallholders' productivity and resilience. CIRAD was a partner, alongside RFI and France 24, for this 7th edition of the competition, focusing on digital technology in support of agriculture.



Launch of the PRETAG initiative

The PRETAG (Pesticide Reduction for Tropical Agricultures) initiative is coordinated by CIRAD with the support and participation of Agropolis Fondation and the FARM Foundation. It aims to pool knowledge of synthetic pesticide use in tropical farming systems and foster the development of alternatives.



Synthetic pesticide use has increased considerably over the past two decades in tropical countries © R. Belmin, CIRAD

Europe: Choosing a vaccination strategy against avian influenza

As part of a project headed by Ceva Santé Animale, CIRAD is evaluating several vaccination strategies suitable for the poultry and pig farming sectors in France. Its work is based on a tool developed in Egypt and subsequently rolled out to other countries in the global South such as Vietnam, and on the experiences of countries that have already gone down the vaccination road.

May

A study shows the potential of urine

Installing urine collection systems in sub-Saharan city regions would make those conurbations more sustainable. This was demonstrated by a study by four researchers from CIRAD, IRD, Boubakar Bâ University of Tillabéri (Niger) and Joseph Ki-Zerbo University, Ouagadougou (Burkina Faso), published on 3 May in *Regional Environmental Change*.



A recent study showed that urine is the main source of nitrogen losses in sub-Saharan African city regions, which could cause environmental eutrophication, as in this instance: a lake covered by water hyacinths © T. Wassenaar, CIRAD

Thirty years of CIRAD in Zimbabwe

Over the last 30 years, CIRAD has implemented over 30 projects nationwide aiming to provide Zimbabwe with innovative solutions for sustainable development. This partnership began in with support for goat production, and has since been extended to numerous research fields, from natural resource management to the agroecological transition, by way of food security.

Launch of the third series of the CIRAD podcast

"Nourrir le vivant" (Feeding the Living World), the CIRAD podcast, brought out six new episodes on the topic of "Climate, growing solutions". They invite listeners to explore paths towards more resilient farming systems in the face of climate change and visit CIRAD's projects in Burkina Faso, Cambodia, Colombia, Nicaragua, Senegal and Tunisia.



2023 HIGHLIGHTS

June

Mid-term results from the TerrAmaz project

A workshop was held in Montpellier in late June with the coordinators of the TerrAmaz project sites in Brazil, Colombia, Ecuador and Peru, midway through the project. A media briefing highlighted the solutions developed by territories in the Amazon to conserve forests and restore degraded soils, ahead of the Amazon Summit in Brazil in August.



Paragominas, in Brazil, is one of five TerrAmaz project pilot sites
© R. Poccoard-Chapuis, CIRAD

Second Global Sorghum Conference, on Sorghum in the 21st Century

Sorghum is a major ally in the fight against climate change. More than 400 participants attended this conference organized by CIRAD in Montpellier from 5 to 9 June, with Kansas State University, Sorghum ID, IRD and the Centre d'étude pour l'amélioration de l'adaptation à la sécheresse (CERAAS).



Field experimentation for varietal improvement of sorghum
© CIRAD

July

Transforming urban food systems: launch of AfriFOODlinks

Two years after the UN Food Systems Summit, African cities are working to map a new path for research into African food systems. The Afri-FOODlinks project, in which CIRAD is a partner, aims to make food systems more resilient and improve access to quality food.



© P. Currie, ICLEI Afrique



August

Amazon Summit and Amazon Dialogues

These meetings, held in Brazil in late August, demonstrated the political will of the eight Amazon countries to improve forest management in the region through the participation and consultation of local communities and institutions. Alongside their partners, several scientists from CIRAD contributed to the Dialogue days and attended the debates during the Summit.



© CIRAD

"During both the Dialogues and the Summit, we saw this determination to put local communities back at the heart of forest management policies", says Plinio Sist, an ecologist at CIRAD

September

For an "IPCC" for One Health?

In an article in *The Lancet Global Health*, co-coordinated by CIRAD, a team of researchers assessed the advantages and disadvantages of creating an Intergovernmental Panel for One Health (IPOH). The "One Health" approach considers human health in connection with animal and environmental health.

There is no responsible research without scientific integrity

Éditions Quae recently published a book (in French) that recaps on the fundamental principles of scientific integrity. Scientific integrity is central to responsible research, and essential to the robustness and reliability of the knowledge generated and to sustained public confidence in science.



Multi-partner workshop as part of the Santé-Territoire project
© R. Belmin, CIRAD

First Africa climate summit

The first Africa Climate Summit, held in Kenya in early September, resulted in the Nairobi Declaration calling for a global tax on greenhouse gas emissions from fossil fuel use. After a boom lasting several years, carbon credits are increasingly under fire. They often have few real climate benefits, and have failed to encourage businesses to change in order to cut their greenhouse gas emissions.

October

Three Basins Summit

This event, from 26 to 28 October, brought together political leaders, public and private development financing institutions and international organizations. CIRAD and IRD co-organized a side event focusing on the scientific support needed to achieve the objectives of the Partnerships for Forests, Nature and Climate (PFNCs). The challenge is to preserve and restore the world's three largest forest basins: the Amazon, the Congo and the Borneo-Mekong-Southeast Asia basins.



In the mountains of Costa Rica, burnt trees recall the wildfire that occurred there a few years ago. Climate change will have major implications for forest fires © B. Locatelli, CIRAD

Publication of a summary of the roots and tubers roadmap

Cassava, sweet potato, yam, taro, and so on... tropical roots and tubers play a major role in food security for people in tropical areas. In a context of rapid population growth and increasing dependence on imported cereals, CIRAD has unveiled a ten-year roadmap for the development of tropical roots and tubers and their markets.

Read the summary, available in English, French and Spanish:



A new agreement on health ecology

An unprecedented partnership agreement covering Health Ecology for the period 2023-2030 is aimed at rolling out integrated health approaches, notably "One Health". It was signed at CIRAD on Wednesday 25 October by Montpellier City and Metropolitan Councils and research organizations in the region, in the presence of CIRAD CEO Elisabeth Claverie de Saint Martin.

November

Launch of a sustainable land use programme in Congo

The Republic of Congo is embarking on a nationwide rural land use planning exercise. CIRAD will be working over the next five years to support Congo in this exercise, by transferring tools and methods and gathering and analysing the data required for land use planning.



Woodpile being built to produce charcoal, which is used in urban areas of Congo as a domestic fuel © E. Dubiez, CIRAD

A meeting for the future of agriculture in the French overseas regions

To co-draft its 2024-2029 roadmap for farming systems in the French overseas regions, CIRAD invited some thirty of its overseas partners to Montpellier on 27 and 28 November. The meeting was an opportunity to highlight the expertise built up within those five overseas regions and territories, which are on the front line of both agricultural and environmental challenges.



© C. Cornu, CIRAD

Ten years of innovations for agriculture in the French overseas regions with the RITAs

For more than ten years now, the agricultural innovation and transfer networks (RITAs, founded on the initiative of the Ministry of Agriculture, local authorities, CIRAD and ACTA, have succeeded in fostering a dynamic of inter-institutional collaborations that benefit the agricultural world and the agroecological transition. This anniversary was an opportunity to take stock, as the RITAs embark upon a third phase, this time involving the French Chambers of Agriculture.

December

COP28: time to take stock of the results of the Paris Agreements

COP28 was held in Dubai (United Arab Emirates), from 30 November to 12 December 2023. According to a UN warning, the world is set for a 3°C increase in temperatures by the end of the century if current policies are maintained. CIRAD considers that urgent action is needed to transform farming and food systems if we are to achieve carbon neutrality.



© R. Belmin, CIRAD

Presentation of the Cacao Forest project's results

The results of the Cacao Forest project to foster sustainable cocoa growing in the Dominican Republic were presented on 7 December. The initiative, coordinated by Earthworm Foundation and CIRAD, is the fruit of an unprecedented alliance between French chocolate makers and research and higher education establishments, with support from the Agence Française de Développement and the TERRA ISARA endowment fund.



One of the agroforestry models developed as part of the Cacao Forest project (Duarte province, Dominican Republic) © O. Deheuevels, CIRAD

2023 PORTFOLIO

Understanding environmental justice in a rapidly changing context

A book, "Justice environnementale dans les espaces ruraux en Afrique", looks at the differences in access to environmental resources and unequal distribution of environmental risks in Africa, introducing the concept of environmental justice. It analyses environment-related criteria of justice and highlights how unrestrained development certainly often fosters growth, but frequently to the detriment of the historical narrative of the relations of domination. The book is aimed at researchers, NGOs, students and donors.

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Land observatories and agricultural land acquisitions

CIRAD and its partners in Senegal have been working for several years to analyse land use dynamics observation structures in Senegal, to boost their impact in the light of growing commodification of arable land. In response to the land rush on the part of foreign investors, observatories, of which CIRAD is a partner in several, have been working to identify the players involved and the socioeconomic and environmental consequences of acquisitions. Their analysis shows the need for consultation and suggests using remote sensing tools to facilitate land governance.

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Fodder crops being grown with centre-pivot irrigation in the Senegal River delta © M. Dieye, Isra Bame

Climate change adaptation policies: “could do better”

A cross-cutting analysis by CIRAD of climate change adaptation policies in seven countries and regions has identified 14 adaptation options pursued by governments. These strategies aim to make agriculture more sustainable and climate resilient and guarantee access to natural resources. Agroecology and climate-smart agriculture are the two agricultural models favoured, instead of conventional agriculture. However, there is still doubt as to the capacity of these measures to respond to the climate emergency.

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In Casamance (Senegal), traditional lowland rice growing is under threat from rising sea levels © R. Bejmin, CIRAD

A close-up photograph of a woman's head and shoulders. She is balancing a large, bright yellow plastic bowl on top of her head. The bowl is filled with several ripe mangoes, some showing green and yellow skin. Her hair is styled in traditional braids, many of which are coated in a dark, thick substance, likely shea butter or a similar natural oil. In the background, another person is partially visible, wearing a blue and yellow patterned shirt. The setting appears to be an outdoor market stall with a pink and white striped canopy.

Understanding the mango value chain in Burkina Faso better

Issue 62 of the CIRAD policy brief *Perspective* presents the results of a study by the VCA4D project of the mango value chain in Burkina Faso. The value chain accounts for almost 3% of the gross domestic product generated by agriculture in the country, but social and health conditions for people working in the sector are poor. The study recommends looking beyond the conventional split between “traditional” and “modern”, and analysing how the informal sector works, to make policy more effective.

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Working towards more sustainable oil palm

The TRAILS project, coordinated by CIRAD in Malaysia, aims to make the oil palm value chain in Borneo more sustainable. The project, which is banking on agroforestry, has the support of local partners, a private firm, a university and an NGO. Endemic species have been identified and planted in agroforestry plots, demonstrating the advantages of a holistic approach for both biodiversity and productivity.

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Mechanical planting of oil palms as part of the TRAILS project (Sabah, Malaysia), A. Rival © CIRAD

Rabies: zero human deaths by 2030?

CIRAD is working with the Pasteur Network in Cambodia and Madagascar to implement the One Health approach to fight rabies. The aim is to achieve the global “Zero by 30” target, in other words to end human deaths from dog-mediated rabies by 2030. Reducing the number of deaths from this neglected disease means focusing on targeted vaccination of dogs and improving access to post-exposure prophylaxis for humans.

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Sustainable tropical forest landscape management

CIRAD devoted considerable resources to sustainable tropical forest management throughout 2023. Conserving those forests while enabling local people to improve their living conditions is the main aim of the establishment's research in response to the threats facing such ecosystems and the people who depend on them. In placing the inhabitants of forest zones at the heart of its research approaches and seeing them as potential actors in conserving those ecosystems, CIRAD has an original vision built on its long-term experience of applying its inter-disciplinary research approach in the main forest basins worldwide.

Tropical regions are significantly affected by deforestation and forest degradation. These consequences of human activity are compounded by the current context of climate change and biodiversity erosion, which are a source of multiple types of stress for such ecosystems. In view of the major role tropical forests play in climate regulation and in energy and agricultural transitions in many tropical countries, CIRAD considers that it is vital to conserve existing forests by means of better landscape management. In 2023, it worked with its partners on several research projects aimed at addressing these issues. Be it the Tropical managed Forests Observatory (TmFO), which it coordinates (<https://www.tmfo.org/>), or the BioForest or Mix4change projects (<https://mixforchange.cirad.fr/>), this report looks at CIRAD's various operations in all four corners of the world. The establishment is also participating in a new priority research programme and equipment (PEPR), FORESTT (Forests and global changes: socioecological systems in transition), aimed at federating French forest research. The programme is piloted by INRAE, in collaboration with CIRAD and CNRS, will run for eight years, and has a budget of 40 million euros.

The establishment has also demonstrated its commitment through targeted communication at several major international meetings throughout what was a particularly eventful year for tropical forests. For instance, CIRAD researchers participated in the One Forest Summit in Libreville (Gabon) in March, in the Amazon Summit and Amazon Dialogues in Brazil in August, and in the Amazonia/Congo/Borneo-Mekong-Southeast Asia Summit of the Three Basins in Brazzaville (Congo) in October. The publication in October 2023 of an advocacy

note entitled “CIRAD is committed to the future of tropical forests” was further proof of the establishment’s strong commitment to the topic (<https://www.cirad.fr/en/cirad-news/news/2023/three-basins-summit>).

Tropical forests are continuing to be lost

The consensus is clear: even if the situation varies from one continent to another, tropical forests are under threat. Between 1990 and 2020, 400 million ha of tropical forests were lost, primarily by being converted to farmland, pasture or industrial plantations. Logging is also acknowledged as the main cause of forest degradation. Both intensive and subsistence farming exert major pressure on forests, albeit to varying degrees from one continent to another. Nevertheless, tropical forests are still biodiversity hotspots, and make a huge contribution to carbon capture. In view of these factors, CIRAD favours an approach aimed at conserving forests by means of sustainable management practices.

Timber supplies and biodiversity maintenance: two huge challenges

Both planted and natural forests are sources of wood, and tropical forests are no exception. In 2023, the International Congress on Planted Forests (ICPF2023) was held in Nairobi, Kenya. This was the first time the congress was held in Africa, and it focused on planted forests as nature-based solutions to satisfy growing demand for wood products, while helping to restore forest ecosystems and mitigated climate change. CIRAD took part in the congress, which attracted scientists, technicians and private players interested in sustainable planted forest management and promoting their operations in the global South.

As regards natural forests, post-logging forest dynamics monitoring results show that there is an urgent need to conduct a substantial review of logging regimes (intensity and cycle duration) and develop other sources of wood by means of forest restoration programmes.

CST Forêt Policy brief no. 2.
L'opérationnalisation de
l'approche de la restauration
des paysages forestiers
en question : décryptage
et perspectives



Forest management for timber
production and forest landscape
restoration in the amazon: the way
towards sustainability.
Science Panel for the Amazon
policy brief



Knowing forests to preserve them better

Who can say now which species will be suitable for a given territory in 2070? With the current galloping climate change, there is an increasingly urgent need to understand ecological and biophysical processes and quantify environmental impacts. Slowing deforestation and forest degradation requires better knowledge of tropical ecosystems, to determine their capacity to respond. Long-term monitoring of such ecosystems serves to understand how they function, with a view to predicting their future more accurately and adapting how they are managed. This applies to both natural and planted forests. Social forestry research is vital and complements ecological research with a view to reconciling biodiversity, carbon capture and resource production for local people. CIRAD favours an inter-disciplinary approach when it comes to tropical forests, ranging from sociology to ecology.

If tropical silviculture is to tackle the issues surrounding conservation and forest restoration, it needs to reinvent itself. The aim is to take on board the results of research into forest dynamics monitoring and move towards restoration-oriented silviculture in degraded territories, in consultation with the various actors in those territories. The success of sustainable tropical forest management also depends on involving local people on a massive scale. CIRAD is ideally placed to work with its partners to tackle these issues. ■

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BioForest, tropical forest diversity under the microscope

Logged tropical forests can conserve high levels of diversity, but there is very little in the way of data on long-term changes in their diversity and floristic composition. However, both diversity and composition play a role in tropical forest functioning and resilience. This information is therefore vital given that these forests are likely to be exposed to ever greater disruption in future. The aim of the BioForest project is to understand the changes in tropical forest diversity and floristic composition after logging, and how those changes are influenced by environmental conditions on a pantropical scale. To this end, BioForest is working on experimental sites across the three main tropical forest basins, which have been logged and monitored for between ten and 40 years. The project, which began in September 2023 and is due to run for three years, involves 15 researchers from ten countries and 12 institutions, including five people from CIRAD. It is funded and hosted by the Centre de synthèse et d'analyse sur la biodiversité (CESAB) in Montpellier. Its work should serve to produce a standard database on logged tropical forest diversity, and scientific articles and other communication products analysing diversity pathways and the factors that determine them.

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CIRAD, a major global forestry research player

2023 was a year of “forests”, marked by a series of major international events. CIRAD was very present at a number of them, for instance at the One Forest Summit organized in Gabon in March, under the aegis of France, and at the Amazon Summit in Brazil in August. Each of these events was an opportunity for CIRAD to take a stand on various issues. To this end, it produced a series of documents – position papers, factsheets, etc – that are freely available on cirad.fr.



DR

From the One Forest Summit to One Forest Vision, science to the rescue of tropical forests

Several CIRAD scientists participated in the One Forest Summit.

We talk to Vivien Rossi, tropical forest modelling specialist at CIRAD, based in Brazzaville (Republic of Congo), who was there.

What was the One Forest Summit, and why were you there to represent CIRAD ?

Vivien Rossi: The One Forest Summit on 1 and 2 March in Libreville, Gabon, was a turning point in terms of preserving biodiversity and fighting climate change, by focusing on the protection and sustainable management of the three main tropical forest basins: Congo, Amazon and Southeast Asia. The initiative has the support of French President Emmanuel Macron, who attended the summit. Several CIRAD researchers were also there, to promote our work in the region on these major global issues and the involvement of research organizations in the Congo Basin in the initiative. CIRAD was there alongside the R2FAC platform in partnership [Research Network on the Forests of Central Africa].

What can we take away from the event?

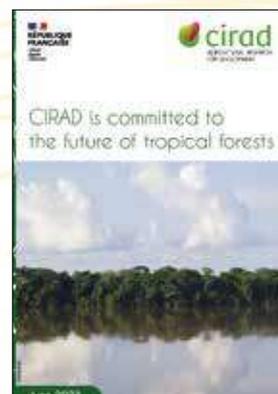
V.R.: Strong commitments were made, with the creation of a 100-million-euro fund to preserve tropical forests. It is open to States, private players and NGOs such as Conservation International. Emmanuel Macron announced at the summit that France would be contributing 25 million euros. The fund will support “country packages”: funding partnerships for countries keen to implement national forest preservation action plans. Four countries declared an interest in committing to country packages in Libreville: Gabon, Republic of Congo, Democratic Republic of Congo and Papua-New Guinea. At COP23 in Dubai, the Republic of Congo and Democratic Republic of Congo formalized their commitment by signing a declaration establishing the partnership. This confirmed the commitment to forest preservation on the part of the Republic of Congo, which already has a range of operations under way, including a sustainable land use project in which CIRAD is the main technical support partner (see box p. 15).

Alongside the summit, the One Forest Vision initiative (OFVi) was launched to foster research operations contributing to the implementation of country packages. France has committed six of its leading research organizations to addressing the challenges set by OFVi: CEA, CIRAD, CNRS, INRAE, IRD and MNHM. The forests of the Congo Basin have not previously been studied to any great extent, particularly compared to those of the Amazon Basin. There are plans to combine satellite images and field data with new artificial intelligence tools, to process the mass of available information effectively and fill the gaps in our knowledge of these forests. It is vital that we understand these ecosystems if we are to draft management rules or schedule interventions. In view of its extensive network of partners and experience in the countries concerned, CIRAD has a major role to play in the country packages and the OFVi. We will consistently work with our partners in the region to build a raft of operations, to maximize their impact and sustainability. ■

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Find out more

Position paper:
“CIRAD is committed to
the future of tropical forests”





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Amazon: indigenous people are once again involved in sustainable forest management

The leaders of the eight Amazon countries (Brazil, Bolivia, Colombia, Guyana, Ecuador, Peru, Suriname and Venezuela) met in Belém, Brazil, on 8 and 9 August. The political summit was preceded by the “Amazon Dialogues”, involving scientists, NGOs, members of civil society and other public representatives. Alongside their partners, several scientists from CIRAD contributed to the Dialogue days and attended the debates during the summit.

Plinio Sist, forest ecologist and Head of CIRAD’s Forests and Societies research unit, reports back.

Why take part in the Amazon Summit?

I was there as part of the Science Panel for the Amazon, a network of more than 250 researchers, 2/3 of whom come from the eight Amazon countries involved in research in the Amazon, and of which I am also a member. During the dialogues, we presented a number of policy briefs, notably on the bioeconomy. The summit was also an opportunity to talk to ministry representatives about biodiversity and research.

What did you take away?

The Amazon Summit was one of the rare events where Amazon countries have met up and talked to each other, with a strong presence on the part of indigenous peoples and traditional local populations. Indigenous peoples were also near the top of the agenda throughout the summit. The Belém Declaration, signed during the political summit, underlines the role of local communities in the implementation of sustainable management of both forests and natural ecosystems in general. One major issue

is promoting social forestry in the Amazon, a region not just of 580 million hectares, but of 30 million people. If we want to conserve these forests while allowing people to make a living from them, we have to promote social forestry. To this end, we need to adapt forestry legislation to the realities of community forest management. The French social forestry system could be a source of inspiration in this respect. I’m talking about communal forests, or the national forest owners’ council. In France, 75% of forests, most of them small-scale, are privately owned, so cooperatives have been founded to build larger areas. The issue is the same, albeit on a larger scale, in the Amazon. I was struck by the new impetus and openness generated by Lula’s return to power in Brazil after Jair Bolsonaro’s presidency from January 2019 to January 2023. That impetus has allowed local communities to express themselves fully, thanks to renewed dialogue. Indeed, the catchphrase at the summit was “Brazil’s back”... This new openness also applies to international cooperation, an opportunity that CIRAD will be sure to take up. ■



Find out more

The Amazon:
putting local communities
back at the heart of considerations



Le Cirad en Amazonie.
Une coopération scientifique diversifiée
pour le développement durable des territoires



Factsheets: CIRAD’s operations
in the Amazon
(available in French)



PUDT Congo: CIRAD is helping Congo with its national sustainable land use planning programme

As its name suggests, the Republic of Congo's sustainable land use planning programme (PUDT) is intended to build a rural land use planning process that will support its development and economic diversification policy while limiting its impact on forests. CIRAD is a partner in its implementation, by means of four thematic components.

We talk to CIRAD forestry engineer Émilien Dubiez, who is project leader and head of the fuelwood component.

What are the four components of Congo's PUDT?

Land use planning is the central pillar of the project, from which the main expected outputs are a national land usage plan (PNAT) and a national land use planning mechanism (SNAT). This will mean establishing and implementing an inter-sectoral consultation process that has never been seen before in Congo. It will be backed up by a group in charge of analysing the results of the project and making land use planning recommendations at the highest political level. CIRAD will be supporting the group, which is called the Groupe d'animation et de concertation sur l'aménagement du territoire (land use planning leadership and consultation group - GACAT) and comprises representatives from 13 ministries, the private sector, decentralized authorities and civil society. This component will be fuelled by the work of four sector-based components: agriculture, forest, energy and environment, whose orientations will have a direct impact on land use. In terms of agriculture, CIRAD will be studying the agronomic potential of various parts of the country, with a view to producing development scenarios for crops that the Congolese government sees as a priority (cassava, groundnut, maize, etc). In the field of forestry, CIRAD's aim is to build a methodology for mapping potential high-conservation-value or high-carbon-stock zones,

The Republic of Congo's sustainable land use planning programme (PUDT) was drafted and funded under the Central African Forest Initiative (CAFI), with a total budget of 28 million dollars. The Agence française de développement (AFD) is also contributing funding. CIRAD is a partner in the implementation of the PUDT, alongside five other organizations: the Center for International Forestry Research (CIFOR), the World Wide Fund for Nature (WWF), the High Conservation Value Network (HCVN), the Wildlife Conservation Society (WCS) and the World Resources Institute (WRI).

to guarantee that they will not be used for agriculture. Lastly, as regards energy, the aim is to produce fuelwood supply master plans for the cities of Brazzaville and Pointe-Noire.

In what way is this project a first for CIRAD?

CIRAD committed to support the Congolese government over five years by signing a technical support contract on 3 July 2023 with the Ministry of Land Use Planning, Infrastructures and Roads. For CIRAD, the project's scope, complexity and budget are unprecedented. Geographers, economists, agronomists, foresters, ecologists, geomaticians, etc, from a range of CIRAD research units will be involved in the project, alongside national experts. Our operations will be guided by the principles of co-construction and consultation, to support policymakers as effectively as possible when it comes to determining future land use plans for Congo. ■

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DR



The Mayombe forest and development of shifting slash-and-burn agriculture on slopes

© F. Pinta

Publications \ Policy papers

Thinking beyond the failures of the first forest restoration programmes. Improving certification standards to help fight imported deforestation, in France and throughout Europe. These are the ambitions of two new policy papers published by the Comité scientifique et technique Forêt (CST Forêt), to which CIRAD contributed.

Policy paper no. 2: "L'opérationnalisation de l'approche de la restauration des paysages forestiers en question : décryptage et perspectives"



Policy paper no. 3: "Quel potentiel de la certification dans la lutte contre la déforestation tropicale importée?"



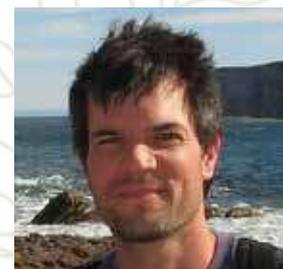
Science Panel for the Amazon 2023 Policy Brief Forest management for timber production and forest landscape restoration



Metradica, a project to predict the vulnerability of tree species to climate change in French Guiana

With more than 1700 tree species, the forests of French Guiana are home to a significant amount of biodiversity. The Metradica project, funded by the Center for the Study of Biodiversity in Amazonia (LabeX CEBA) over four years, ended in 2023. It enabled studies of the vulnerability of tree species to climate change in French Guiana, by bringing together, for the first time, a large number of other studies, researchers and data.

Ghislain Vieilledent, ecologist at CIRAD and co-coordinator of Metradica, presents the project.



DR

What is Metradica?

The Metradica project set out to study the vulnerability of tree species to climate change in French Guiana, based on the mechanistic functional traits of those species. The aim was to determine their resistance to drought through certain leaf traits. There is a substantial amount of information in global databases on so-called “soft traits” (synthetic functional traits – wood density, leaf area, etc), but to date, few links had been established with the ecophysiology of the plant, for instance the capacity of leaves to retain water within their cells. In addition to studying traits, Metradica aimed to combine these data with improved information on the environment and soils. The project also compiled all the forest inventories conducted in French Guiana, including data from various scattered and often very longstanding research facilities (ONF, CNRS, AMAP, Paracou research station, etc). In addition to the researchers involved, the project facilitated three theses, two of which were successful, and a post-doc. Publications are also planned.

Soil sampling by Vincent Freycon (Forests & Societies research unit) and Pierre-André Wagner (EPLEFPA Macouria), at different depths in a soil pit in a forest in French Guiana, for laboratory analyses of soil physical properties under the umbrella of the METRADICA project



© G. Vieilledent, CIRAD

What difficulties did you come across and what was learned from the project?

Gathering data on soils, in the field, is a long, difficult task, hence the limited data available prior to the project. This was one of the project’s most notable results, for French Guiana as a whole. The information obtained on soils enabled a better understanding of water availability for plants and its variability on a territory scale. The PhD student on the project revealed the importance of geology and geomorphology in determining soil texture, which affects water availability for plants. This information will serve to understand forest typology in French Guiana better. Now that the project has ended, we still do not fully understand everything that determines the types of species combinations in French Guiana. It was difficult to estimate the impact of reduced rainfall on changes in species, given the relative absence of water stress across the territory. The idea now is therefore to work more on an Amazon Basin scale.

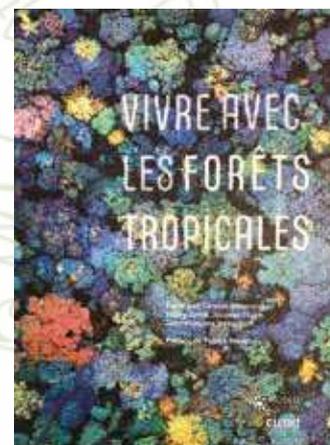
So what now?

The project enabled significant progress in terms of compiling datasets and preliminary analyses. A new project could provide new answers: which species will be resilient? Will we be faced with mass tree mortality as temperatures rise and rainfall decreases? Work is planned on characterizing the soils in French Guiana, their water reserves, and how that affects spatial distribution of species. The planned simulations based on the data acquired and compiled during the project will give a better idea of the vulnerability of the forests in French Guiana to climate change. ■

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Publication \ Coffee table book

Vivre avec les forêts tropicales:
a book to re-think relations
between people and forests



Science Panel for the Amazon (SPA): a science panel for both the Amazon and the people who live there

The Science Panel for the Amazon, founded in 2019, is the first high-level science initiative devoted to the Amazon. The group was created to present clearly the scientific, economic and moral arguments in favour of conserving the Amazon and to fight widespread deforestation, forest degradation and forest fires, which have intensified in recent years. It comprises 250 scientists, who published the 2021 Amazon Assessment Report at COP26.

We talk to Marielos Peña-Claros, Co-Chair of the SPA and one of CIRAD's longstanding partners.



DR

Can you tell us about your background and about your partnership with CIRAD?

I am a Bolivian forest ecologist and have lived in the Netherlands for 18 years. I am currently Professor at the Forest Ecology and Forest Management group of Wageningen University. I used to work for the Bolivian Institute of Forestry Research. My first encounter with researchers from CIRAD dates back 20 years or so, at a conference on forest management in Brazil. Then we worked together more closely in 2012, via the Tropical managed Forests Observatory (TmFO), which one of CIRAD's researchers, Plinio Sist, played a major role in creating. He is currently Coordinator, along with CIRAD's Camille Piconiot. The TmFO is a unique network: it has a very different perspective from others, since it focuses on natural forests used for timber production.

How do you see the way in which CIRAD, and particularly its Forests and Societies research unit, is working on tropical forest conservation?

CIRAD plays a vital role, since it focuses on forest management. Unfortunately, while there is substantial research on forest protection, those forests are generally considered without the people who live in them. We know that forests are felled, that resources are extracted, but we need to bear in mind that people rely on forests for their livelihoods. CIRAD plays an important role in this

respect, since it assesses humans' impact on forests and is working to determine what needs to be done to conserve those forests along with the people who live in them. Universities generally focus more on research, whereas development is vital. Interdisciplinary approaches like CIRAD's are necessary.

What is the Science Panel for the Amazon (SPA), and what is your role?

I have been involved in the SPA since September 2019. The Panel was initiated by the UN Sustainable Development Solutions Network (SDSN), and now comprises 250 people, 65% of them from Amazon countries. The SPA's remit is to synthesize the available scientific information on the Amazon so as to study and assess the state of the region and build solutions based on that knowledge. Our first assessment report was published in 2021 and launched in Glasgow. Since then, we have published ten policy papers, which were distributed at COP27 and COP28. The first in-person meeting of the Science Steering Committee was held in Belém in March 2023. At the meeting, we worked on a strategy plan for the next three years. It was a very exciting event, as it was the first time we were able to meet face-to-face, after two years of intensive work at a distance. We are working hard to reach policymakers and other stakeholders and ensure that our recommendations are taken on board when making decisions concerning the Amazon. ■

theamazonwewant.org



Publications \ Scientific articles

The semi-deciduous forests of West Africa, which face various types of disruption inextricably linked with human activities, are central to a new study published in *Biological Conservation* by the Institut National Polytechnique Félix Houphouët-Boigny (Ivory Coast), CIRAD and Wageningen University (Netherlands). Marie Ruth Dago, Irie Casimir Zo-Bi, Vinciane Badouard, Marco Patacca, Bruno Héroult, *Concomitant effects of multiple disturbances (logging, fire, biological invasion) on native tree abundances into West Africa's semi-deciduous forests*. *Biological Conservation*, Volume 285, 2023. <https://doi.org/10.1016/j.biocon.2023.1102200>

The work on Araucaria by Mario Tagliari, a Brazilian PhD student co-supervised by CIRAD's Ghislain Vieilledent, is highlighted in *Nature Climate Change*: <https://www.nature.com/articles/s41558-023-01674-9>

An article by Grégoire Blanchard on the **dynamics of forest edges, under the umbrella of the Reliques**

project led by Philippe Birnbaum in New Caledonia: Grégoire Blanchard, Nicolas Barbier, Ghislain Vieilledent, Thomas Ibanez, Vanessa Hequet, et al. *UAV-Lidar reveals that canopy structure mediates the influence of edge effects on forest diversity, function and microclimate*. *Journal of Ecology*, 2023, 111, pp.1411-1427 <https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2745.1410>

An article on **wood science**: *Effectiveness of three Gabonese tree resin fractions combined with tebuconazole as wood preservative formulations*. Bedoungindzi Walter Fiacre, Candelier Kevin, Edou Engonga Prosper, Dumarçay Stéphane, Thévenon Marie-France, Gérardin Philippe. 2023. *Journal of Wood Chemistry and Technology*, 43 (1): 46-58. <https://doi.org/10.1080/02773813.2023.2176519>

Functional trade-offs are driven by coordinated changes among cell types in the wood of angiosperm trees from different climates. Zhang Guangqi, Mao Zhun, Maillard Pascale, Brancheriau Loïc, Gérard Bastien, Engel Julien, Fortunel Claire,

Heuret Patrick, Maeght Jean-Luc, Martínez-Vilalta Jordi, Stokes Alexia. 2023. *New Phytologist*, 240 (3): 1162-1176. <https://doi.org/10.1111/nph.191322>

An article on **biochemical cycles within planted forests**. *Potassium limitation of forest productivity – Part 1: A mechanistic model simulating the effects of potassium availability on canopy carbon and water fluxes in tropical eucalypt stands*. Cornut Ivan, Delpierre Nicolas, Laclau Jean-Paul, Guillemot Joannès, Nouvellon Yann, Campoe Otavio, Stape Jose Luiz, Santos Vitoria Fernanda, Le Maire Gueric. 2023. *Biogeosciences*, 20 (14): 3093-3117.

<https://doi.org/10.5194/bg-20-3093-2023>
An article on **tree growth modelling, based on data** from Paracou (French Guiana): Schmitt, S., Héroult, B., & Derroire, G. (2023). High intraspecific growth variability despite strong evolutionary legacy in an Amazonian forest. *Ecology Letters*. <https://doi.org/10.1111/ele.14318>
<https://doi.org/10.1111/ele.14318>

Scientific research



In the light of the challenges posed by sustainable development in the global South in the current demographic, climate, environmental and social context, CIRAD and its partners are convinced that there is a growing need for knowledge and innovations. To tackle those challenges and ensure that it is capable, through science, of helping societies in the global South to make a range of unprecedented transitions, CIRAD has identified six priority research topics.

Each of those topics relates to a major research issue shared with our partners in the global South, on which CIRAD has chosen to work collectively, in an integrated, multidisciplinary way, so as to reinvent, diversify and broaden its scientific and partnership-based output.



Innovative alternatives to pesticides: a vital issue for the future of farming

In a special issue of the journal *Environmental Science and Policy*, scientists from Europe and Latin America look at the possible alternatives to pesticides. They distinguish between two main types of strategies. The first is solutions based on substitution, with technologies such as bio-control. This is the type favoured in France, Argentina and Brazil, where it is seen as a promising technology that would sustain high productivity without fundamentally disrupting the conventional agricultural model.

The other type is solutions based on an in-depth overhaul of cropping and agricultural production systems, such as organic farming or agroecology, using a range of techniques such as crop diversification, use of organic products (manure, compost, etc), and crop rotation. Several European countries have shown an interest, particularly Sweden and Denmark, which have managed to reach a target of 80% organic food in canteens.

Moving beyond pesticides: Exploring alternatives for a changing food system



Zero-pesticide plantain banana plot, Ivory Coast © S. Dépigny, CIRAD

ACP

Agroecology applied to crop protection: the zero-pesticide farming challenge

Agroecological crop protection is a novel approach that aims to either partly or totally cut pesticide use.

Agroecology sets out to make use of biodiversity and boost soil health to make farming systems more resilient. Applied to crop protection, its principles frame an approach that would make it possible to do without most pesticides: agroecological crop protection [ACP].

ACP relies on prevention, by using tolerant and resistant varieties, suitable farming practices and a combination of agronomic solutions, rather than cure, involving pesticides. One of the specificities of the approach is that it can be

used on a territory or agrosystem scale, triggering a virtuous circle of using biodiversity to boost agrosystem health. Recent research revealed a strong link between plant diversity and natural pest regulation.

ACP was the subject of a reference article published in the journal *Advances in Agronomy* in 2023. This article, signed by 56 scientists, expresses the clear scientific consensus in France around ACP. It includes some 300 bibliographical references from every continent and opens up new prospects in terms of research operations.

The authors consider that ACP is capable not just of maintaining or improving agricultural yields but also of ensuring healthy food, reducing environmental impacts, and helping to make farms more economically viable. And it does all that while partly or totally cutting pesticide use.

Two-way knowledge sharing between scientists and farmers is vital for the transition towards agroecological crop protection. Public policy will also be needed, to support the necessary technical and organizational changes. ○

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In sub-Saharan Africa, many producers apply one or two preventive broad-spectrum insecticide treatments per week. The systematic use of the same active molecules triggers resistance in pests, forcing producers to step up applications even further



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PRETAG

The PRETAG initiative. Banking on co-building to cut pesticide use in the tropics

Pesticide use worldwide almost doubled between 1990 and 2018, with a significant increase in tropical countries. The PRETAG initiative is working to reverse the trend, by fostering alternative solutions.

 The aim set for the PRETAG (Pesticide Reduction for Tropical Agricultures) initiative is to pool knowledge of synthetic pesticide use in tropical farming systems and foster the development of alternatives.

The initiative is ensuring that researchers and drivers of change work together to build concrete alternatives that can be used in the field. In its first phase, PRETAG is looking at five case studies characteristic of certain value chains: market gardening in West Africa, cocoa growing in West Africa, rice growing in Southeast Asia, coffee growing in Latin America and Asia, and dessert banana production in Africa and the West Indies. All the stakeholders in value chains will be involved in these studies, to pinpoint the changes needed to reduce pesticide use, while taking account of economic costs.

PRETAG is coordinated by CIRAD in partnership with Agropolis Fondation and the FARM Foundation, and involves scientists from 14 research units in Montpellier. After the initial two-year phase, the initiative aims to build a global alliance to reduce synthetic pesticide use in tropical farming systems, and foster exchanges of both experiences and knowledge. The FARM Foundation will be playing an active role, by helping to bring drivers of change on board to fuel advocacy operations resulting from the project.

PRETAG also intends to support existing projects working to reduce pesticide use: the ECOFFEE R&D initiative for coffee, the MARIGO project for market gardening, the French Sustainable Cocoa Initiative (IFCD) and the national conservation agriculture and sustainable intensification consortium (CASIC) for rice. ○

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> The PRETAG initiative is supported by Agropolis Fondation and the FARM Foundation.



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Might the future of local organic farming in Africa lie in participatory certification?

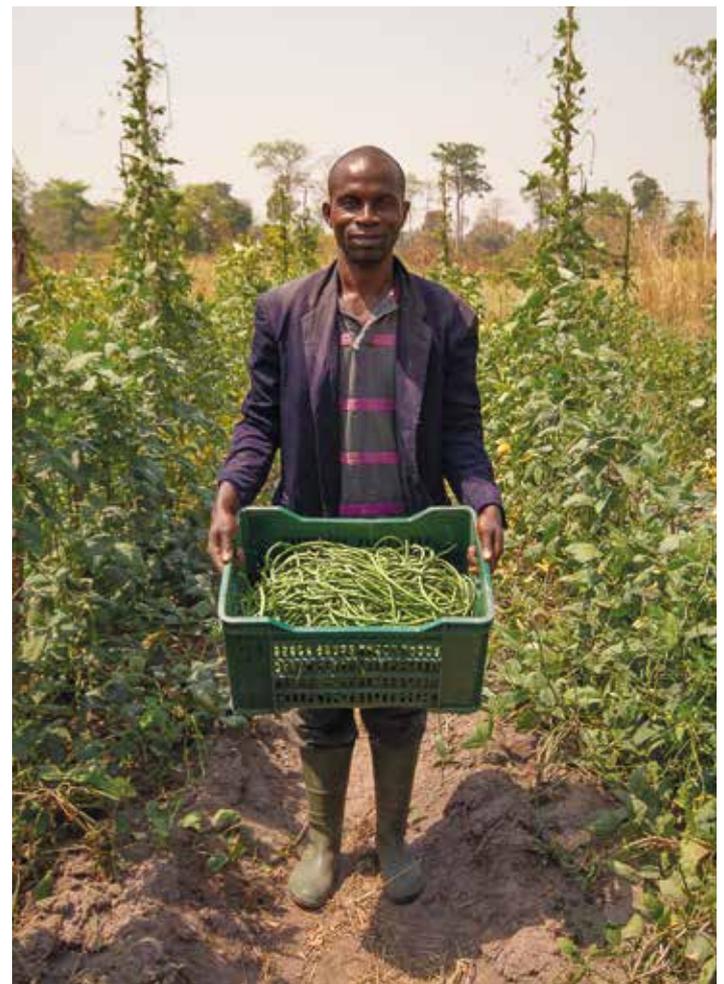
TA FS

As their name suggests, participatory guarantee systems (PGS) are participatory, non-market certification schemes based on peer assessment. In view of the lack if not total absence of legal frameworks for organic farming in Africa, this type of certification could determine its future on the continent. PGSs have been growing steadily over the past several years, and now involve almost 10 000 farmers in Africa. This basic shift has been fuelled by growing demand for healthy products.

PGSs are an alternative to third-party certification, and are the only way of labelling sustainable farming for local and regional target markets. CIRAD is supporting this organizational innovation through meetings, training courses and the co-construction of methodological tools. The current aim of the existing PGSs is to become independent within five years, which would be a step towards the sustainability of such participatory certification initiatives in Africa.

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Market gardening in Akpessekro, Ivory Coast © R. Belmin, CIRAD





TERRAMAZ

Improved farming practices foster the return of forest. Lessons from the Amazon

Territories in the Amazon are innovating to help cattle farmers manage their farms sustainably. As a result, productivity per hectare is up, and forests are regenerating.

In Paragominas, Brazil, the TerrAmaz project is helping farmers to adopt rotational grazing, which improves both the animals' diet and soil fertility, and allows any unused land to be left fallow. There is a simple principle behind this approach: organizing landscapes according to soil properties. Clay plateaus, for instance, are used for agricultural activities since they are ideal for them and easily accessible. Slopes, ravines and floodplains, on the other hand, are difficult to plough and are therefore set aside, which allows for forest regrowth.

TerrAmaz's activities in Paragominas are backed up by mapping tools, to monitor land use changes precisely. In agreement with the local water board, the maps produced serve to pinpoint zones that should be reforested as a priority, along ravines or on eroded slopes. In exchange, new forest cover serves to cut the high cost of treating

water in Paragominas [it contains a lot of suspended particles, due to soil erosion]. The water board is looking into incentives as a way of encouraging farmers to restore landscapes. The local authorities are keen on the idea of payments for ecosystem services, funded by people in urban areas, to boost solidarity between urban and rural inhabitants.

These innovations are not limited to Paragominas. Other territories in the Amazon, such as Cotriguaçu in Brazil and Guaviare in Colombia, have embarked on the same approach, albeit using different tools. In Guaviare, livestock farmers have signed forest resource conservation agreements covering 930 hectares of forest, or 30% of the total area of farmland in the municipality.

For the CIRAD scientists involved in the project, which is due to be completed in 2024, such initiatives should be supported, capitalized on and linked across the Amazon, in collaboration with local governments and development players. ○

> **TerrAmaz is funded by the Agence française de développement (AFD).**

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In Paragominas, Brazil, practising rotational grazing boosts productivity per hectare and encourages farmers to let slopes, which are difficult to farm, lie fallow
© R. Pocard-Chapuis, CIRAD





Five new tree-living earthworm species discovered in Martinique

Scientists from CIRAD have discovered five new tree-living earthworm species in Martinique. The species lives on epiphytic plants that use trees as a support, such as fungi and mosses. This hitherto unsuspected biodiversity is under a double threat from deforestation and the introduction of invasive exotic species.

According to the scientists, these worms are probably endemic to the region. Their work demonstrated a positive correlation between the

abundance of endemic species and forest cover. However, endemic species specializing in a given habitat, like these worms, risk being gradually replaced by invasive exotic species, which are generally more competitive in the event of habitat degradation. In view of the lack of knowledge and the potential loss of biodiversity in relation to tropical earthworms, conservation operations are vital.

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Earthworm in a bromeliad © M. Coulis, CIRAD



Biodiversity: reframing payments within a co-investment for sustainable development approach

TA

Should the international community pay tropical forest countries for services to humanity? The countries concerned frequently request such payments to compensate for their loss of revenue as a result of being unable to convert forest areas to farmland and mining operations. In a recent issue brief, the Institut du développement durable et des rela-

tions internationales (IDDRI) called for such payments to be included in a broader co-investment for sustainable development approach.

Investment needs are massive in least developed and lower middle-income countries, with a particularly acute investment gap for sustainable development in rural areas and in the land sector. National payments for environmental services (PES) could attract funding for such territories, but must fit in with national public policies and public investment flows. According to IDDRI, a co-investment approach for sustainable development opens the way to other complementary sources, for instance via fiscal instruments, or positive biodiversity impact or climate impact certificates.

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Photo : A. Rival © CIRAD

Oil palm planting in Tabasco © L. Feintrenie, CIRAD



OPTIPALMEX

When oil palm plantations restore biodiversity

In Mexico, the OptiPalMex project set out to make oil palm plantations both productive and beneficial for the environment, by means of agroforestry practices.

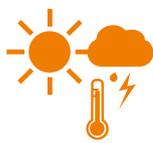
Ensuring positive impacts both for the environment and for rural communities, in terms of jobs and livelihoods: this was the challenge set by the OptiPalMex project, through support for the development of a sustainable palm oil sector in Mexico. The idea is to plant oil palm agroforest corridors to provide shade. These "corridors" link conservation areas and facilitate wildlife movement, while guaranteeing an economic return for farmers.

The project's area of intervention stretches across the states of Tabasco and Campeche, two regions marked by past deforestation. OptiPalMex is testing several agroforestry systems, including endemic tree species with prospects, such as logwood. Logwood, a legume with draining properties, is seen as endangered in Mexico. The wood of this small tree is currently used to make fence posts, and in the past, it was used for its dye properties.

In Mexico, the palm oil market is driven by small family farms, with a maximum of 20 hectares each for 94% of producers. The country currently imports 70% of its palm oil consumption. OptiPalMex is thus contributing to national policy to reduce imported deforestation and hopes to dynamize the value chain by offering practical, sustainable and economically viable solutions. The project is coordinated by PalmElit and CIRAD, and involves several Mexican partners from both the research and agricultural sectors.

> This stage of the OptiPalMex project is financed by the French treasury, via the FASEP fund (study and assistance fund for the private sector).

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FRENCH OVERSEAS REGIONS

“4 per 1000”: new recommendations to preserve soil carbon in the French overseas regions and mitigate climate change

For the first time, the “4 per 1000” initiative has inventoried soil carbon stocks in the French overseas regions and made practical recommendations to preserve them, notably by means of appropriate agricultural and forestry practices.



The SOERE-PRO platform in Réunion was used to study the transferability of the low-carbon label to the French overseas regions R. Carayol © CIRAD

The carbon stocks in the soils of the French overseas regions are equivalent to around 20% of those in the soils of mainland France, despite their small area (15% of that of mainland France). This substantial contribution is due to the novel mineralogy of these soils, which are built on volcanic rock. The forests of French Guiana also play a major role: the carbon stored in their aerial biomass is equivalent to 120% of the aerial carbon in the forests of mainland France.

These figures were revealed by the “Overseas 4 per 1000” study, coordinated by CIRAD in partnership with INRAE and IRD. This novel assessment highlighted the importance of taking account of the specificities of each overseas territory when thinking about sustainable soil carbon management. However, it pinpointed a lack of data for certain zones. There are large amounts of data on the soils of Guadeloupe, Martinique, French Guiana and Réunion, albeit fragmented. However, there is no information at all for Mayotte, Saint-Barthélemy or Saint-Martin.

To preserve stocks, the authors recommend ensuring that tools for planning and implementation of the Common Agricultural Policy (CAP) incorporate payments for ecosystem services associated with agricultural and forestry practices. Incentive measures could also boost the agroecological transition. In some territories, it is vital to combat land speculation. In addition to these initial recommendations, the scientists also suggest several priority research operations. They include adapting quantification methods to tropical conditions and crops. Stepping up research on the social dimensions would also provide keys as to the obstacles to the adoption of agroecological practices, for instance. The study concluded with the need for a holistic vision, integrating the specificities of each overseas territory in soil carbon preservation policy. ○

> Download the “Overseas 4per1000” study

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Nairobi Declaration: Africa is calling for a global carbon taxation regime

In September 2023, following the Africa Climate Summit, the Nairobi Declaration made an urgent call for a global tax on greenhouse gas emissions from fossil fuel use. Africa needs 600 billion dollars by 2030 for its energy transition. As carbon credits are increasingly under fire for their supposed inefficacy, the continent is pushing for a global carbon tax, which could serve to fund the transition.

Although they are controversial, several African countries, such as Ghana and Senegal, are looking to carbon credits as a solution. However, voluntary carbon markets are looking too uncertain, with their price dropping and their environmental credibility increasingly in doubt. The Nairobi Declaration stresses the attractiveness of a taxation-based approach, suggesting that a global carbon tax would generate stable revenue. France supports this idea. However, its implementation is a diplomatic headache. It would require global support, involving bringing key players such as China and the US on board.

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ADAPTATION

Cereals: could millets be the staunchest allies of sustainable, resilient agriculture and food production?

2023 was the International Year of Millets, a family of cereals found in many tropical countries that could be valuable resources for adapting crop farming to climate change.

The main types of millet, such as sorghum (great millet) and pearl millet, play a vital role in the staple diet of 600 million people in the arid zones of Africa and Asia. Despite this, they are often seen as “secondary cereals” compared to more commonly grown ones such as maize, wheat and rice. However, their nutritional value – they are rich in fibre, minerals, vitamins and anti-oxidants – and



the fact that they are gluten-free, makes them key elements for food security.

In addition to their use in the human diet, millets have a range of applications, from animal feed to energy and biomaterial production. Their ability to grow under difficult ecological conditions makes them allies of the agroecological transition, highlighting the importance of relying on natural regulation mechanisms rather than on input use.

However, millets face a number of challenges. Improving production systems, seed quality, fighting biotic stress and improving access to credit are all vital for improving yields. In many semi-arid regions, investment in the drying, storage and processing of millet products is required. Moreover, the various stakeholders in the value chain are still largely uncoordinated.

In designating 2023 International Year of Millets, the UN recognized the importance of these crops. The World Conference on Sorghum, held in Montpellier in June 2023, served to catalyse synergies between research and development partners, paving the way for greater recognition of millets in temperate and developed countries. ○

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Fonio, one of the most ancient cereals in Africa © J.-F. Cruz, CIRAD

Are we on the way to global climate solidarity?

Although African countries emit little greenhouse gas, they are amongst the most vulnerable to the effects of climate disruption. They also find it difficult to obtain international funding to cope with this challenge and embark upon the energy transition required for their development. The IPCC stresses that sub-Saharan Africa is already seeing more intense droughts, affecting its economy, which is highly dependent on agriculture and is often informal. In June 2023, Agropolis Fondation and CIRAD organized a conference on climate change in Africa. The participants called for global climate solidarity and for an increase in funding for adaptation and mitigation in Africa. The question that remains is whether increased awareness of climate injustice will result in concrete actions at future global climate talks.

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SWM

A change of gear for the Sustainable Wildlife Management Programme

B OH

The SWM programme works to reduce unsustainable wildlife hunting while boosting food security. In 2023, the initiative was allocated a further 25 million euros.

 The Sustainable Wildlife Management (SWM) programme, launched in 2017, works with African, Caribbean and Pacific countries to build sustainable wild meat value chains. The European Union (EU) recently allocated additional funding to the initiative, headed by FAO, for its second phase. CIRAD is a member of the implementing consortium, alongside the Center for International Forestry Research (CIFOR) and the Wildlife Conservation Society (WCS).

SWM promotes participatory management of resources centring on the inclusion and commitment of local communities. It is working with more than 80 local communities in 16 countries to improve the livelihoods of local people, who depend on hunting. New approaches are being tested to reconcile wildlife conservation and food security, in line with the sustainability principles set out in the Kunming-Montreal Global Biodiversity Framework.

The increasing demand for wild meat means it is now necessary to roll out these new approaches and their results on a wide scale. SWM is keen to reduce urban consumption of wild meat from



unsustainable sources. This goes hand-in-hand with setting up healthy, legal wild meat supply chains. The Covid-19 pandemic highlighted the interdependence between human and animal health, and the role of certain hunting practices in zoonosis emergence. An entire component of the programme is devoted to monitoring disease emergence and training hunters to detect the first signs of disease in wildlife.

The new EU funding will serve to boost SWM's impact and sustainability, by sharing the lessons learnt and the tools and innovations developed. Networks are due to be set up on a national, regional and international scale. ○

> The SWM programme is funded by the European Union, with co-funding from the Agence française de développement (AFD) (Botswana-Namibia component) and the French Global Environment Facility (FFEM) (Sahel component)

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Hunter in the Kavango- Zambezi (KaZa) Transfrontier Conservation Area
© B. Stirton-Getty Images for FAO, CIFOR, CIRAD, WCS

Transforming food systems: from assessment to policy



Consultation within territories, Senegal © R. Belmin, CIRAD

Food systems are vital levers for achieving the sustainable development goals. At the request of the European Union, CIRAD and FAO developed a food system assessment methodology applicable on a national and infranational level. The aim was to help stakeholders build a shared vision of the issues surrounding food system sustainability and to enlighten and support public policybuilding.

The method has been applied in some 50 countries. This involved around 20 CIRAD researchers, almost 300 FAO consultants and teams of national consultants, in addition to representatives of both institutions and civil society. The assessments served to initiate intersectoral dialogue and make use of local know-how. They demonstrated similarities between territories in different countries, highlighting the need to rethink food system pathways on a regional scale.

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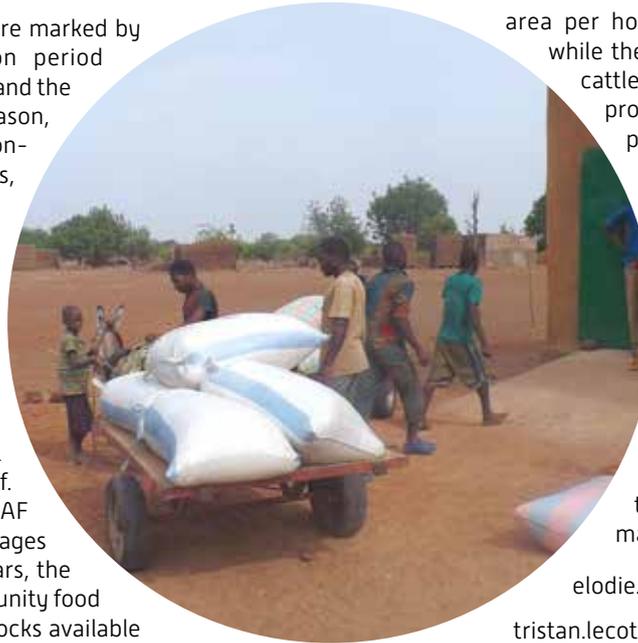
MICROCREDIT

Storing a portion of harvested grain in exchange for a loan: the advantages of inventory credit in the Sahel

Growing numbers of farmers in the Sahel are turning to inventory credit. The aim of the practice is to postpone selling crops in order to withstand the lean season.

Many rural areas in the Sahel are marked by a lean season: the transition period between the depletion of food stocks and the new harvest. The longer the lean season, the more food-insecure the areas concerned become. In response to this, growing numbers of farmers are turning to inventory credit. This loan-storage device provides producers with microloans in exchange for storing part of their harvest. In addition to shortening the lean season, the device serves to boost incomes and encourage agricultural investment.

This practice is covered in issue 61 of *Perspective*, the CIRAD policy brief. Between 2013 and 2016, the FARMAF project funded warehouses in eight villages in Burkina Faso. Over those three years, the benefits of inventory credit for community food security were clearly visible. Millet stocks available per household were estimated at 69 kg more than in villages without inventory credit, and the lean period was cut in half. Agricultural investment also saw significant benefits: the cultivated



area per household grew by around 1.8 hectare, while there were between one and two head of cattle more on average. Inventory credit also protects farmers against postharvest social pressure, by allowing families to avoid rapidly using up their stocks to pay for ceremonies or repay their debts.

According to the scientists involved, there are three conditions for successful inventory credit: adequate infrastructures (concrete warehouses), stored grain quality guarantees, and trust between financial institutions, producers' organizations and traders. The Ministry of Agriculture in Burkina Faso is currently working to define a legal framework to secure market transactions. ○

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Releasing grain stocks at the end of the inventory credit period prior to the lean season in the village of Magnimasso, Mouhoun, Burkina Faso

Supporting the diversity of urban food systems in the global South

Food supply systems vary significantly in the towns and cities of the global South: small and medium-sized companies, farmers, wholesalers and market or street traders, supermarkets or online sales. Recent research work produced a typography of urban food systems in the global South, classifying them in six categories. This characterization enabled a clearer understanding of how urban areas are supplied with food and suggested that public policy should not focus only on formal systems such as supermarkets or online outlets, since small-scale production and sales operations are often both well



organized and efficient despite their logistical constraints. These results would steer policy towards distributing investment more evenly, to guarantee fair access to quality, affordable products. The recommendations include renovating markets in line with traders' and consumers' requirements and focusing efforts on infrastructures, regulations, or support for small companies.

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Street food seller in Jakarta, Indonesia
A Rival © CIRAD



AFRICAM

At the heart of villages, preventing the next pandemic with the AfriCam project

AfriCam is an ambitious project to strengthen surveillance and early detection systems in four African countries and Cambodia.

Prevention would cost a hundred times less than controlling future pandemics. This is what prompted AfriCam, a project aimed at improving prevention of future pandemics in five countries: Cambodia, Cameroon, Guinea, Madagascar and Senegal. Over three years, AfriCam will be deploying early detection systems to minimize the emergence of zoonoses, with a methodology anchored in local contexts. To this end, the project is using innovative and participatory approaches based on the mobilization of local populations and including a range of players such as public and private research organizations, universities, NGOs and competent authorities.

AfriCam is the first grassroots project launched by the PREZODE (Preventing Zoonotic Disease Emergence) initiative. PREZODE itself was launched in 2021, and brings together an international community working to prevent the emergence of zoonotic diseases by building resilient, sustainable and economically viable socio-ecosystems.

The One Health approach, on which AfriCam’s activities are based, highlights the links between human, animal and ecosystem health. It fosters multidisciplinary collaboration to prevent emergence, for instance by including veterinarians and ecologists in surveillance systems. Local people are also involved in analysing high-risk practices, to help build suitable prevention solutions. Participatory surveillance complements traditional epidemiological surveillance, and guarantees the success of these new surveillance networks. The prevention strategies developed will be both realistic and inexpensive, and will subsequently be written into public policy.

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> AfriCam is supported by the Agence française de développement (AFD), CIRAD and IRD.



Official launch of the AfriCam project at the 2023 Paris International Agricultural Show, with [L to R] CIRAD CEO Elisabeth Claverie de Saint Martin, AFD CEO Rémy Rioux, Deputy Head of Sustainable Development et the Ministry for Europe and Foreign Affairs Clélia Chevrier Kolako, and Head of the Ecology, Biodiversity and Continental Ecosystem Functioning (ECOBIO) Department at IRD Emma Rochelle-Newall

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Preventing pandemics: dialogue between scientists, policymakers and civil society takes off at last

The One Health approach is considered vital for anticipating the emergence of epidemics, yet such approaches are struggling to be implemented, as the barriers between the worlds of science, policy and civil society are still too high. In a number of round tables organized by PREZODE in February 2023, scientific experts, political and development players, donor representatives and members of civil society came up with a number of ways to boost “science-society-policy” dialogue.

The first obstacle they identified was the lack of trust and credibility between political leaders, social players and scientists. To remedy this, the experts suggested building new communication bridges, possibly in the form of dialogue facilitators. Mediation and simplifying scientific information are also suggested ways of fostering mutual understanding.

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A. Rival © CIRAD



MONITORING

Using the One Health approach to prevent the risk of an avian influenza epidemic

According to a statement from the French Committee for the Monitoring and Anticipation of Health Risks (COVARs), avian influenza is becoming established in both wild and domestic avian fauna. However, there is little risk to humans.

The avian influenza epidemic in France in 2021-2022 led to the preventive culling of 21 million poultry birds at a cost of a billion euros. Cases of direct contamination between infected birds and mammals were seen at a mink farm in Spain in late 2022. While the risk of transmission to humans remains low, according to a COVARs statement released in June 2023, measures to prevent the spread of the disease must be stepped up.

The COVARs recommendations are based on the One Health approach, and include a reminder of the importance of domestic fowl/wildfowl and fauna/human interfaces. Avian influenza surveillance networks should thus include anyone in regular contact with birds: farmers, abattoir workers, hunters, ornithologists, field staff from various organizations, etc.

Following the cases of direct contamination between infected birds and mammals, the EU authorized poultry vaccinations. In France, duck



farms were authorized to vaccinate as of October 2023. Additional biosecurity measures such as disinfecting installations and contaminated tools were also introduced. The COVARs also recommends that people in contact with domestic and wild birds be vaccinated against seasonal flu. Although the risk of transmission to humans is low, this could prevent virus recombinations.

Lastly, since the H5N1 virus is circulating not just in Europe but also in South and North America, the members of the COVARs reiterate the importance of working on it on both a European and international level. The impact of climate change on birds' migratory routes should also be taken into account, to anticipate the spread of the disease more effectively. ○

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Antimicrobial resistance: a study demonstrates the interconnection between human, animal and environmental health in Madagascar

A study coordinated by CIRAD has highlighted the importance of the inextricable links between human, animal and environmental health in terms of spreading resistant bacteria in Madagascar. The study, which was one of the first on this scale in the global South, assessed the transmission of resistance genes in the Antananarivo region.

The study revealed the substantial genetic diversity of bacteria within this limited geographical zone. It also served to identify new, previously unknown groups of beta-lactamase-resistant *Escherichia coli* strains. Moreover, the scientists highlighted the ease with which resistance seemed to circulate between different hosts and environments, making it impossible to distinguish bacteria that may be specific to a given host or environment. In view of this, the researchers involved are calling for strategies based on One Health to fight antimicrobial resistance more effectively.

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In Madagascar, bacterial resistance phenomena circulate very easily between animals, humans and their environment © AdobeStock





THE AMAZON

Certifying the sustainability of an entire territory: the gamble being taken by a Brazilian municipality

In Paragominas, the idea is not to certify an agricultural product, but the entire municipal territory and its development pathway. This completely new type of certification is inclusive, and provides security for investors.

In Paragominas, the idea is not to certify an agricultural product or a producer group, but the entire municipal territory and its development pathway. This approach, built in collaboration with local people, is a completely new type of territorial certification that guarantees transparency and security for investors and for the authorities.

The initiative, which is supported by the TerrAmaz regional project funded by the Agence française de développement and coordinated by CIRAD, aims to fight deforestation in the Amazon by supporting transitions to sustainable forms of development. The certification process hinges on modernizing data management, building an IT infrastructure that allows the municipality to gather and manage all the necessary data on the territory, including maps of soils, forests and rivers.

The participation of local people is vital. They were consulted to set sustainability targets and choose the most appropriate indicators and means of verification. This participatory approach ensures that local people are involved in implementing the scheme, and fosters



collective understanding of the territory's assets, limitations and constraints.

To guarantee full transparency, the partners in the TerrAmaz project have come up with a free online platform, offering a mapping and consultation service to allow users to monitor the evolution of sustainability indicators. IMAFLORA, a Brazilian certification organization, will provide independent proof of the progress made across the territory.

The territorial certification of Paragominas could set an example for other territories in the Amazon. It was presented at the Amazon Dialogues, ahead of the Amazon Summit in Belem in August 2023. ○

> TerrAmaz is funded by the Agence française de développement (AFD)

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Field survey with a farmer in Paragominas, a municipality in the heart of the Brazilian Amazon © R. Poccard-Chapuis, CIRAD

A tool to rapidly estimate tropical fruit crop yields



The innovative PixFruit® tool developed by CIRAD provides a digital solution for rapidly estimating tropical fruit crop yields. In 2021, it resulted in the launch of a smartphone app, SoYield, developed in partnership with the SOWIT firm.

As of 2023, the app can be used on mango and clementine, and allows producers to quantify their future

harvest merely by taking a few photos of their trees. The results are shown in the form of yield indicators, facilitating the decisions to be made by growers, buyers and public players. SoYield now has 400 active users in four countries: Ivory Coast, Ghana, Morocco and Senegal.

The fruitful partnership between CIRAD and SOWIT is intended to

allow the rollout of PixFruit® and SoYield to other crops and regions. PixFruit® comes under the umbrella of Cirad'Innov®, a brand dedicated to developing environmentally friendly and socially responsible innovations in the field of sustainable agriculture.

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Testing the PixFruit digital solution in a mango field in Ivory Coast © J.-M. Koffi, CNRA



TERRISTORIES®

Playing at changing how we manage territories

TerriStories® is a serious game that allows communities to play an active part in managing their territory. It has already taken off in Burkina Faso, Burma, Ivory Coast, Senegal and Vietnam.



Players using a version of the TerriStories® game © P. D'Aquino, CIRAD

Boards that serve as farms or regions, pieces to attribute the resources in a given territory, and players pretending to be the mayor, a farmer, an investor, or an ecologist. Using a serious game, TerriStories®, members of a community can simulate their own territorial management proposals.

The tool was developed by scientists from CIRAD and tested for the first time in Senegal, in the town of Ross Béthio. Scientists, local politicians and development staff used TerriStories® to draft new collective land use rules, notably arbitrating between crop and animal farming. Six years on, this gave rise to Senegal's first land use and allocation plan (POAS). Since then, other towns and villages in Senegal have used TerriStories® to draft and roll out their own POASs. The game has been adapted to work on other scales, covering several municipalities or regions, and even whole countries. Successful trials have been conducted in a range of countries, such as Burkina Faso, Ivory Coast, Burma and Vietnam.

The aim, by means of simulations, is to foster an endogenous, local perception of territorial development by allowing the participants themselves to shape the collective rules. Via the participatory approach, players are encouraged to make decisions and shape the rules that best meet their needs. The game then has a direct impact on reality, since it creates the conditions for stakeholders to implement the ideas that emerge. The method is based on making players autonomous and on a step-by-step process that removes obstacles to action one by one. ○

> TerriStories® is a registered trademark of CIRAD.

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Pastoralism | Sidelined by public policy but crucial for dry regions

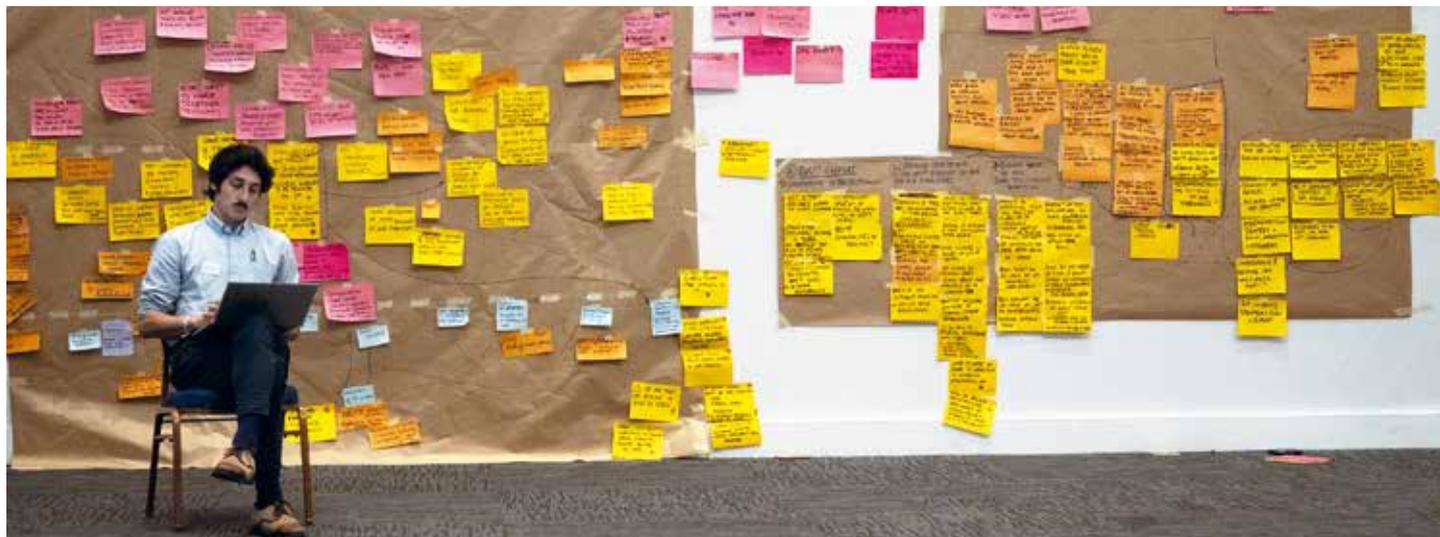
Pastoral and agropastoral livestock systems play a substantial part in poverty alleviation and development in dry regions. Even small herds are vital for household livelihoods and food security in such zones, offering a veritable "walking savings plan". However, the sector is continuing to struggle to find the central position it deserves in public policy, and is still largely overlooked in public policies aimed at alleviating poverty.

In issue 60 of *Perspective*, the CIRAD policy brief, scientists provide a set of keys to measuring and assessing the role mobile livestock systems play in developing the regions concerned. In addition to improved data gathering, the researchers propose a new multi-level set of indicators to support policy decisions. On a nutritional level, the approach is intended to be holistic, encompassing both calorie supply from cereals and protein and fat supply from meat and milk.

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© S. Taugourdeau, CIRAD



Support for the construction of an impact pathway for the One Health community of practice in the Caribbean and central America under the umbrella of the AUSCAR project
© E. Gendron, Cirad

The task set for CIRAD's "ImpresS" (Impact of Research in the South) team, under the umbrella of its "Innovation and Impact" ambition, was to strengthen the impact culture within the organization and alongside its research and development partners. We look back at the team's objectives, methods and tools, and its main operations in 2023.

Since its creation in 2018, the ImpresS team has been working closely with CIRAD's Research Impact and Marketing Service (DIMS) to support debate and collective learning around what research can contribute to innovation processes and societal and environmental impacts. Between research and support, the team comprises eight people, and is working to design, test and share approaches and tools to support change. Through its activities, the team aims to (i) enable an improvement in strategic planning by encouraging teams and their partners to reflect on the mechanisms that could generate impacts; (ii) promote the adoption of postures, approaches and tools for assessing impacts or planning strategically with impact in mind; and (iii) increase the proportion of researchers and partners capable of gearing their research activity to the long-term generation of change. It intervenes both within and outside CIRAD, whenever the ImpresS approach or the team's expertise is called upon.

A fruitful year for impact

In 2023, the ImpresS team helped ten projects (funded by different donors), initiatives, or communities of practice to build their own change theories using the ImpresS ex ante method. It also adapted the approach to new types of projects (development investment funds), and shared it through higher education courses (ISTOM) and with universities and research partners in the global South (Cuba, Senegal). Six projects and initiatives also received support for designing

change-oriented monitoring-assessment systems. Monitoring-assessment training and a transverse analysis of the monitoring-assessment systems used by CIRAD projects were conducted, to enable future projects to improve their practices. The team also organized methodological exchanges and feedback through three thematic webinars within the community of practice around change-oriented approaches, in which more than 120 people from CIRAD and elsewhere participated. Three project change assessments were also funded and supported, by means of an in-house financial incentive to assess the impact of research, set up in 2022 by CIRAD scientific management (see opposite). A transverse analysis was launched of the lessons drawn from the ImpresS ex post assessments produced in 2016 (13) and those produced between 2020 and 2023 (six). Lastly, team impact assessment researchers (UMR Innovation) continued their methodological development and research work to adapt the tools and approaches used to provide support, and their efforts to document learning and CIRAD's institutional pathway in terms of the development of an impact culture.

These various activities serve to fuel methodological advocacy operations focusing on our strategic donors and methodology partners, and look into the merits of building joint activities with our research partners in the global South to develop an impact culture on various levels (countries, regions, global coalitions). ■

Further information

ImpresS
website



ImpresS pages
on cirad.fr

INCENTIVES TO ASSESS



Interview with
Claudio Proietti (CP),
monitoring-assessment
officer, and
Emmanuel Raison (ER),
impact officer

What is the in-house financial incentive to assess the impact of research?

CP and ER: The mechanism was set up in 2022 by CIRAD scientific management, in response to one of the recommendations made in the last HCERES audit: to continue to roll out actions and tools for raising awareness, training and providing support, to contribute to the development of an impact culture at CIRAD and among its partners. It has three specific objectives: (i) to support assessment and reflection approaches in addition to ImpresS ex ante and monitoring-assessment support; (ii) to fuel the production of knowledge on the contribution of research to change and to the processes that brought about that change; and (iii) to share the knowledge and lessons learnt with the teams concerned, and programming, communication and advocacy services at CIRAD.

The mechanism serves to provide teams with methodological support – through the ImpresS team – and financial backup for two types of assessments: change assessments, for current or recently completed operations, and impact assessments, for longer-term operations.

What were the first activities in 2023?

ER and CP: After the RTBfoods project assessment in 2022, an exercise that served to test the mechanism, 2023 saw its formal launch. Three assessments were conducted, of three projects: GABIR, a project concluded in 2020; PACTE, which is scheduled to end in 2024; and TerrAmaz, which is at the halfway stage. These three projects were selected on the basis of certain criteria: the motivation of the teams concerned to conduct “development-oriented” assessments, the expected use of the results of these exercises, and the specific and strategic interest of these assessments and projects for CIRAD’s research units, departments and priority research topics. With the assessments, we were able to analyse the change mechanisms triggered by each project and the contributions made by the projects and other interventions to the emergence of new knowledge, skills, practices and interactions between players.

In all three cases, it transpired that it is essential to have a certain understanding of the system of players within which the project is working, and to take account of the political, social and economic context, to ensure that the strategies implemented are as appropriate and effective as possible.

From a methodological point of view, the three cases provided an opportunity to develop and test new approaches in collaboration with the assessment teams, which comprised either experienced assessors or Masters students on end-of-course internships, alongside project staff. All the assessments included a debate of the results with stakeholders, by means of participatory workshops, and suggestions were made of how to report on and apply the results, to encourage their practical use. ■



VALUE CHAINS

Moving towards implementing the roadmaps

Since 2020, CIRAD has drafted “ten-year roadmaps” for each of the 13 main tropical value chains on which it works¹. These documents focus on the main challenges to be tackled in order to develop sustainable value chains, and on CIRAD’s ambitions and commitments aimed at tackling those challenges. These documents are now starting to be rolled out.

CIRAD’s research and expertise have changed significantly since its founding, broadening out from production-focused issues to a systemic approach: considering every segment of the value chains concerned and the people involved, and taking account of the agronomic, technical, economic, social, environmental and cultural challenges that surround them. This approach is backed by several decades of research, giving CIRAD vital advantages for addressing the dynamics of transition within tropical value chains in response to global challenges: knowledge of players, the situation on the ground and the constraints faced; long-term data monitoring; and knowledge of the diversity of tropical crops, represented by modern, traditional and wild varieties of cultivated species. CIRAD’s research and expertise cover a wide range of fields: production and productivity within a context of agroecological transition; crop protection; genetic improvement; food and non-food product processing; sustainable supplies; value chain adaptation to climate change; multi-criteria performance assessment; knowledge and development of markets and standards to promote sustainable products and social responsibility within value chains; and academic and technical training

1. Banana and plantain, cocoa, coconut, coffee, cotton, dairy, horticultural crops, oil palm, roots and tubers, rice, rubber, sorghum, and sugarcane.

for value chain stakeholders. That research and expertise is interdisciplinary and increasingly cross-cutting. It takes account of the complexity of tropical farming systems by combining various disciplines, allows for stakeholders' requirements and priorities by co-building its projects, and integrates local contingencies by adopting territory-based approaches. CIRAD is a co-producer of scientific knowledge and information, technical, organizational and institutional innovations, and public and private decision support tools. It also co-designs and provides academic and technical training courses. More than 40% of its senior research staff and 60% of CIRAD's technicians are working on research linked to value chains.

The rollout of the roadmaps

The value chain roadmaps pinpoint cross-cutting priority topics that concern a large number of value chains. CIRAD's research and that of its partners is centred on the crossroads between them: agroecology and improved livelihoods for rural families; product quality and sustainability of production, processing and consumption habits; shared value and shared responsibilities, etc (figure 1). It is those topics that structure the dialogue with CIRAD's research partners and the main value chain stakeholders, to co-build projects and foster the emergence and structuring of collective initiatives and true multi-player research and innovation consortiums, founded on privileged partnerships.

The rollout of these roadmaps began in 2023 with the support of "Value Chain Research Coordinators" for each value chain, CIRAD scientific management, its departments and its research units.

Cross-cutting initiatives

Certain collective initiatives are cross-cutting, such as the inter-value chain pesticide reduction initiative (PRETAG initiative launched in late 2022) involving 20 partners from tropical and Mediterranean countries². Others are more sector-based and centred on developing sustainable value chains that respect the environment and biodiversity and support producers and the value chain as a whole, through research, and encompass the entire range of stakeholders. To quote just a couple of examples, the ECOFFEE initiative³ involves the world's leading coffee importing, roasting and marketing companies, while the French initiative for sustainable bananas (IFBD)⁴ is a multi-player voluntary initiative centring on improving producer incomes, the environmental sustainability of production systems and respect for human rights and labour legislation. ■

2. <https://www.pretag.org/>

3. <https://www.cirad.fr/en/worldwide/cirad-worldwide/projects/ecoffee-r-d>

4. <https://www.cirad.fr/en/press-area/press-releases/2023/the-french-initiative-for-sustainable-bananas>

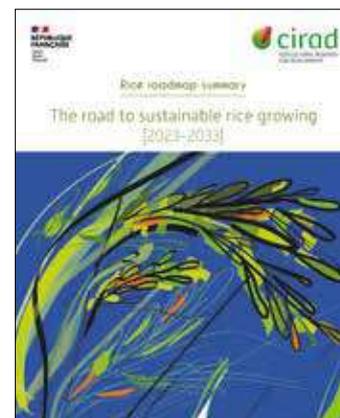
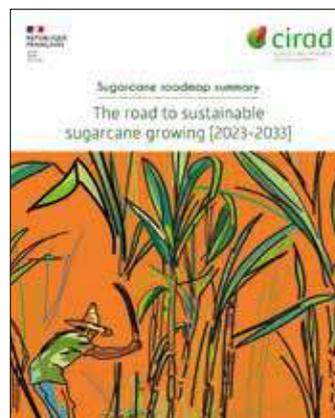
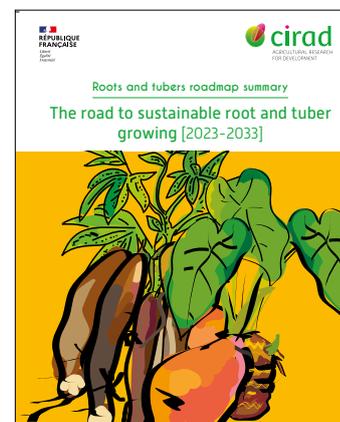
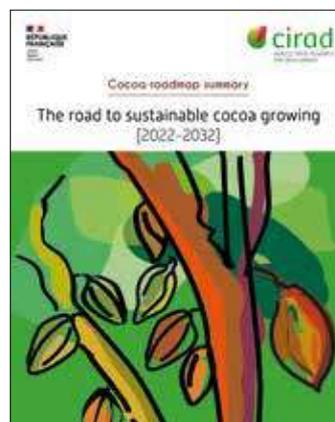
Value chain research at CIRAD

- > Adaptation to global challenges (inc. climate change)
- > Agro-biodiversity of production systems
- > Agroecological approaches
- > Autonomy and incomes for the most vulnerable producers
- > Product quality and markets
- > Sustainable food systems
- > Sustainable territorial development
- > Value chain governance

Find out more

Summaries of four value chain roadmaps were produced in 2023: cocoa, rice, roots and tubers, and sugarcane.

They are available in English, French, and in some cases Spanish, at:



What's new on open science?



Informing, training, analysing and reporting allows CIRAD to anticipate, support and change scientific and research data publishing practices.

2023 was a busy year in every respect for scientific information at CIRAD. On an institutional level, there was a major modification, with the name of the office responsible being changed from “Scientific and Technical Information Office (DIST)” to “Scientific Information and Open Science Office (DISCO)” as of 24 October. This new name clearly affirms the service’s long-term commitment to open science.

Informing

In 2023, CIRAD updated two of its commitments to open science: CIRAD is committed to open access to knowledge, and CIRAD promotes publication of its research by reputable publishers. These notes focus on the global Coalition for Advancing Research Assessment (COARA) and changes in scientific publication practices.

The 15th edition (February 2023) of the global Transparent Ranking: Institutional Repositories puts Agritrop 97th of the 3922 institutional repositories ranked. In France, Agritrop is 2nd in the open archive rankings. This ranking aims to support free access to scientific publications by measuring the visibility and impact of scientific open archives.

During International Love Data Week headed in 2023 by the Inter-University Consortium for Political and Social Research (ICPSR, USA), a CIRAD poster highlighted its key research data management achievements in 2022.

Training

CIRAD’s Scientific and Technical Information Office (DIST) training operations in 2023 focused on helping the establishment’s research groups to manage the data generated through research, notably by adopting good practice in terms of: publishing a data paper; choos-

ing a journal or data repository; drafting a data paper; building a data management plan (DMP); managing a collection in the CIRAD institutional repository Dataverse; and preparing, documenting and depositing research data in the repository.

Analysing

As part of a survey by the Court of Auditors of the role of the French research sector in climate change adaptation, CIRAD did a bibliographical study of its publications and datasets on climate change adaptation over the period 2018-2023.

With a view to the free circulation and re-use of classification plans produced, maintained or used in institutional scientific information systems, the new agrist website gives access to a set of controlled vocabularies produced and managed by CIRAD: topics, value chains covered by CIRAD, countries and territories, and scientific disciplines.

Reporting

Since 2023, all the policy briefs (guidance notes, position papers) by CIRAD authors have been accessible in Agritrop, the CIRAD publications open archive.

To characterize the book publishers through which CIRAD and its authors publish, a bibliometric study covering the period 2010-2021 has been done, with a specific focus on works published by Quae, the joint CIRAD-IFREMER-INRAE publishing house.

CIRAD has produced an open-access data visualization of its data included in the open science barometer (BSO) overseen by the French Ministry of Higher Education and Research (MESR). ■



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To find out more,

see the news items on the CIRAD open access portal:



Partnerships, training and communication



PARTNERSHIPS \ A long history with good prospects

In terms of partnerships, 2023 saw several major events. The high points were the celebrations of CIRAD's 30 years in Zimbabwe and Vietnam, and a seminar on the French overseas regions. These pages contain a selection of highlights, followed by a focus on the seminar, which was held in Montpellier on 27 and 28 November.

[May]

An international hub of innovation support platforms from the South and North

Several organizations in Montpellier, including CIRAD, initiated the creation of an International Innovation Hub in order to increase the innovation potential of start-ups and young companies with impact in tropical countries faced with global challenges. This new international structure will bring together several innovation platforms and actors. It is led by the Montpellier Métropole Méditerranée MedVallée initiative and CGIAR.

CIRAD celebrates 30 years of work and partnerships in Zimbabwe

In 1993, CIRAD began working in Zimbabwe, in Masvingo province. In 1996, it implemented the first Fonds français pour l'environnement mondial project, aimed at conserving biodiversity and improving community livelihoods in the Mid-Zambezi Valley. Things have come a long way since! The celebrations centred on a rich programme of events, including a scientific workshop, official ceremony and field trips.

[June]

CIRAD and IRD designated reference centres for zoonotic coronaviruses

The Food and Agriculture Organization of the United Nations (FAO) has designated CIRAD and IRD, which are recognized for their research on emerging infectious diseases, as reference centres for zoonotic coronaviruses, for the coming four years. They will be backing up FAO's operations to detect and monitor these types of coronaviruses.

[September]

CIRAD in Vietnam: 30 years of partnership

For the past 30 years, CIRAD has been a major partner for government bodies and universities in Vietnam. To mark this anniversary, several events punctuated a week of celebrations, including the signing of a new framework agreement between CIRAD and the Vietnam Academy of Agricultural Sciences (VAAS) on Tuesday 26 September 2023.

[October]

Renewal of the framework agreement between CIRAD, the French State, the Réunion Regional Council and the Réunion Departmental Council

CIRAD, the French State, the Réunion Regional Council and the Réunion Departmental Council signed a strategic cooperation agreement on 18 October. The agreement bears witness to their shared commitment to sustainable development and food sovereignty on the island. It follows on from 60 years of financial support from the State and local authorities for agricultural research in Réunion.

Health ecology: a new agreement between Montpellier City and Metropolitan Councils and research organizations

An unprecedented partnership agreement covering Health Ecology for the period 2023-2030, aimed at rolling out integrated health approaches, notably "One Health", was signed on Wednesday 25 October 2023 by Montpellier City and Metropolitan Councils and research organizations in the region. The signing ceremony was held at CIRAD and attended by its CEO, Elisabeth Claverie de Saint Martin.

FOCUS \ French overseas regions seminar: minutes

The French overseas regions have always been a vital part of CIRAD's remit, within a historic, widely recognized partnership framework involving local authorities and the State in particular. CIRAD was keen to formalize its strategy for those regions in the form of a five-year roadmap built hand-in-hand with its partners. To this end, it invited some 50 partners to a seminar in Montpellier in November 2023. Mayor of Montpellier Michaël Delafosse did not hesitate to talk of CIRAD's proud role in boosting the city's visibility and reputation when addressing its partners from the overseas regions at the Montpellier Contemporary Art Centre (MO.CO.) on 28 November, at the close of the seminar. CIRAD CEO Elisabeth Claverie de Saint-Martin, for her part, spoke of universalism, generosity and solidarity. A word from several participants...



Nadine Amusant, Regional Delegate for Research and Technology for the French Guiana region

"The seminar was rich in exchanges with a wide range of players, particularly local authorities, which meant that the overseas regions were well represented, in a constructive atmosphere geared towards sharing. It allowed participants to report on requirements in those regions and talk to research players to see how they could work together towards a shared vision and solutions as regards issues such as food sovereignty, the agroecological transition, and so on. If I had just one message to put across following the event, it would be that science must be done for and with society, and that we need to include local people to ensure greater impact. Hence the importance of linking society, policymakers and laboratories."



Patrick Dollin, Chair of the Guadeloupe Regional Council Green Economy Commission

"Food sovereignty, agroecology and sustainable food supplies are major topics for Guadeloupe. The regional council is supporting CIRAD projects, and we are following them closely, which helps us draft sustainable public policies for our territories. We have high expectations of CIRAD, which we hope will be able to come up with sustainable solutions for viable farming systems as regards crop diseases, banana, sugarcane, citrus fruits, tomatoes, etc."



Find out more:

Jean-Pierre Chabriet, Réunion Regional Councillor in charge of higher education, research and the energy transition



"Alongside the work on the CIRAD roadmap for the overseas regions, we recently signed the first Contract of agreed objectives, means and performance targets between the Réunion Regional Council and CIRAD. This is the first contract of its type between the council and a research organization. Over the next five years, it will mean greater visibility for CIRAD researchers, allowing them to work long term and structure their activities. The council has embarked upon a policy aimed at transforming the island to make it a land of social progress, with three targets in terms of sovereignty: health, energy and food. CIRAD is working on all three topics, albeit in different ways. In Réunion, it acts as a regional technical hub supporting both business and research operations, and is fully integrated within the territory. With its installations on the island, it will be able to build more partnerships with the Indian Ocean region in future, and promote Réunion as a sentinel, representing France in the region. CIRAD is working alongside the Réunion Regional Council on this, and we are delighted."

Nicaise Monrose, Mayor of Sainte-Luce (Martinique), Executive Councillor in charge of agriculture and food for the Martinique Territorial Authority



"What I will take away from these two days is the usefulness of such meetings between researchers, authorities and other administrations that gravitate around agriculture. We face shared challenges, such as food self-sufficiency and sovereignty in particular. In the French West Indies, we need to ensure that our farming systems, which were traditionally geared towards exporting sugarcane or bananas, shift towards satisfying local people's food requirements. This means talking to research players, because we cannot allow ourselves to boost production at the expense of the environment or consumers. Martinique was a victim of chlordecone, and it has not forgotten. We need to move towards a different model that does not make intensive use of phytosanitary products. We expect CIRAD to support this move, alongside the public authorities and central administration." ■





PLATFORMS IN PARTNERSHIP FOR RESEARCH AND TRAINING (dPs) One byword: co-construction

2023 saw a succession of dP workshops and meetings, in Montpellier and elsewhere. One dP was wound up, the renewal of another proved unsuccessful, but a new platform is due to be inaugurated in 2024, another is emerging, and a capitalization project is in full swing. In any event, the emphasis is on dynamic, balanced partnerships marked by dialogue and co-construction.

The 2023 Partnership Days in Montpellier in June brought together the 12 partner dP coordinators and many CIRAD colleagues, including leaders and correspondents, regional directors and unit heads. The agenda included discussions and co-construction workshops concerning dPs, priority research topics (PRTs) and value chains on a regional level, and discussions of the effects of the health crisis on partnership relations. In addition to these days, which are central to the dP system, 2023 saw a range of other events. Grassroots inter-dP workshops were organized, involving CIRAD researchers, in Hanoi in April (with members of the four dPs in Asia) and in Antananarivo in October (with members of the four dPs working in Madagascar, including partners). The discussions centred on the interactions between dPs and PRTs, and on operating difficulties. The CoMPAR project, which set out to capitalize on the lessons to be drawn from dP operations during and since the health crisis, which has three years of funding from the French Ministry for Europe and Foreign Affairs (2022-2024), has proved to be a powerful lever for supporting and strengthening the dPs. The workshops held in 2023 produced a wealth of constructive initial results, which will be capitalized on in 2024. They should serve to build economically, environmentally and socially acceptable recommendations and tools.

Platforms are being wound up

After four years of transition following the collective decision to renew the GovInn platform, during which a number of researchers worked to build a new dynamic, CIRAD decided to pull out. The initial aim was to establish a pan-African platform on governance and public policy, bringing together English-speaking and French-speaking partners from southern and West Africa, but the diversity of the partners, who did not know each other well enough, a lack of funding and current project activities, and the impact of the health crisis at the start of the process proved too much, despite the efforts made in some circles. The end of this story followed on from CIRAD's withdrawal from the ISA platform in late 2022.

New networks are emerging

The SALSA platform (Sustainability of Agricultural Landscapes in Southeast Asia) was validated by CIRAD's Management Board on 19 December 2023. It is the first platform working entirely in South-east Asian island countries, and includes universities in Malaysia, Indonesia and the Philippines, two regional bodies (SEARCA and ASAIHL), and three French partners: le CIRAD, IRD and Institut Agro. An official launch event is scheduled for 2024.

Following two workshops – one in Abidjan in May and the other in Cotonou in December – the outlines of a new platform on soil functioning and health in West Africa have now been sketched out. This co-construction involves ten African partner organizations in Benin, Burkina Faso, Ivory Coast and Senegal, along with CIRAD, IRD and INRAE. The three French organizations are working hand-in-hand, with a substantial financial contribution from INRAE for 2023-2024 via the TSARA initiative, from CIRAD via the Action incitative dP (dP incentive mechanism), and strong support from General Management at all three organizations. Participatory workshops served to identify a dozen research topics, a range of indicators, and operational arrangements. The platform could be launched as of early 2025, although its exact form (platform in partnership? IRN? 2RI? Hybrid format?) is not yet clear. ■

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The dPs, a novel type of scientific partnership

CIRAD and its partners have been building platforms in partnership for research and training (dPs) since 2009. They are long-term alliances with shared governance, fostering critical mass and interdisciplinarity. Shared research programming has resulted in a portfolio of projects, often funded following competitive calls.

The dPs in figures:

CIRAD is a member of **20 dPs**

700 people, including **155** assigned by CIRAD

243 agreements signed

183 partner organizations

75 countries

8 regional centres

3 international institutions

5 CGIAR centres



Ongoing support for innovation and jobs for young people

For Cirad’Innov, 2023 was marked by innovation and support for young people and entrepreneurship. We shine the spotlight on two key activities during the year: support for the *Campus des jeunes entrepreneurs africains* event, and collaboration with a start-up – Microphyt – under the umbrella of the France relance plan, a source of innovation and jobs.

As part of the *France relance* plan (PFR) launched by the French government following the Covid-19 crisis [see box], the Ministry of Higher Education, Research and Innovation granted CIRAD a budget of 2.1 million euros to establish research and development (R&D) collaborations with target firms in its partner network, aimed at application developments of interest to both CIRAD and the private partners. This has resulted in 18 collaborative research projects at CIRAD, due to run for between a year and two years. It has secured five jobs in R&D, four of them at firms and one at CIRAD. Of the 18 projects, nine have produced applicable results and four have resulted in research collaborations with new partners.

Innovations and jobs

Microphyt, a biotechnology start-up working to develop natural ingredients extracted from micro-algae, is the leader of one of the projects that has served to secure a job. It received a grant under the PFR to boost the development, production and marketing of natural active ingredients extracted from micro-algae and intended for laboratories producing food supplements and cosmetics. Through its collaboration with the QualiSud joint research unit (UMR), it has managed to identify new anti-oxidant systems and compounds of interest that are specific to micro-algae. Work has been done at the UMR to characterize various micro-algae strains on a molecular level, including determining polyphenol and sterol content, fatty acid profiles and lipid classes. QUALISUD was also responsible for studying the performance of the anti-oxidant extracts. Its discoveries have enabled Microphyt to offer new, effective functional ingredients of natural origin. Juliette Wind, a QUALISUD researcher, was recruited

by Microphyt as part of this public-private research collaboration. She is enthusiastic about her experience: *“This experience has opened up new horizons for me and has allowed me to grasp the company’s aims, particularly as regards the development of high-added-value ingredients, and to familiarize myself with regulatory and commercial aspects and with large-scale extract formulation. I was lucky in that they have allowed me a lot of freedom in terms of research, analyses and scientific publications. I have learned a lot of new methods and am delighted to join Microphyt’s R&D team”.*

Cirad’Innov commits to support young African entrepreneurs

The second edition of the *Campus des jeunes entrepreneurs africains*, which was originally an initiative on the part of the Montpellier Méditerranée Metropolitan Council and the Fondation Prospective et Innovation, took place in October 2023 in Paris and Montpellier. The aim was to support the scaling-up of innovative projects with high potential for impact, particularly in the fields of technology, innovation and One Health in Africa. Ten African entrepreneurs were selected for a business trip to France. They were offered a programme including the Business Innovation Centre (BIC) and the Montpellier International Innovation Hub currently under construction, of which CIRAD is a member. The trip enabled the entrepreneurs to do advanced training and meet decision-makers, scientists, economic partners and other leading stakeholders from their sectors.

Thanks to funding from the Occitanie Regional Council via the University of Montpellier, Cirad’Innov, which is also keen to support entrepreneurship and innovation in Africa, was able to organize meetings between African project leaders and specialists from CIRAD. The aim was to discuss technical issues, R&D and impact.

Among the entrepreneurs, Lucie Thiao from Senegal was chosen for her start-up project LUXORUS, an aquaponic farm. At the end of her stay, she thanked the organizers, saying *“I would like to thank the Occitanie Regional Council for facilitating our trip to Montpellier and for giving us the chance to visit facilities and talk to aquaponics specialists with a view to developing the system and having a positive impact on local people”.* In Montpellier, her talks with Jean-François Baroiller, an aquaculture expert with the ISEM joint research unit, and our partner Catherine Lejolivet, a teacher and pioneer in the field at the La Canourgue high school, were very enlightening and served to pinpoint ways of optimizing LUXORUS’s operations. ■

* Since 2020, Cirad’Innov® has offered solutions for the entire range of stakeholders – start-ups, SMEs and large groups, professional federations, NGOs, territorial authorities and public agencies – that can make direct use of them.



The PFR: A roadmap for an economic, social and ecological revival

The French government launched the 2020-2022 French economic revival plan with the aim of reviving the French economy following the economic crisis triggered by the Covid-19 epidemic. It comprised three pillars: “ecology and energy transition” “business competitiveness” and “territorial cohesion”. The plan has 100 billion euros of funding, including more than 7.8 billion for higher education, research and innovation, with 300 million dedicated to securing jobs in R&D.

TRAINING \ Looking south

In 2023, CIRAD broadened its ambitions in terms of training, offering new projects and initiatives in tropical and Mediterranean countries. Having been awarded Qualiopi certification, the establishment is continuing its efforts to keep training at the heart of its activities.

In response to a call for proposals centring on partnerships with higher education in Africa, CIRAD helped to build one of the projects chosen in 2023, aiming to professionalize and step up training at the University of Parakou Faculty of Agronomy (Benin) in sustainable cotton-based production systems. The project, PreFoSyc, is led by ISTOM, CIRAD and the University of Parakou. It is aimed at building training to address the challenge of building skills across all the professions involved in the cotton sector in Benin. CIRAD is also gradually building an alumni network, to keep in touch with former students and partner researchers who have worked in its teams. The network is intended to keep them informed and support them along their career path, while benefiting from their help and feedback. The establishment has also consolidated its commitment to the quality of its interventions, and saw its Qualiopi certification maintained after a monitoring audit, validating its ongoing drive to improve its training operations. After almost a year's work by CIRAD scientific management and IT services, a new tool, Dendreo, will facilitate monitoring of the training provided to students from outside CIRAD and help to maintain the quality of the services it provides, while supporting steering operations.

From West Africa to Southeast Asia, training boosts impact

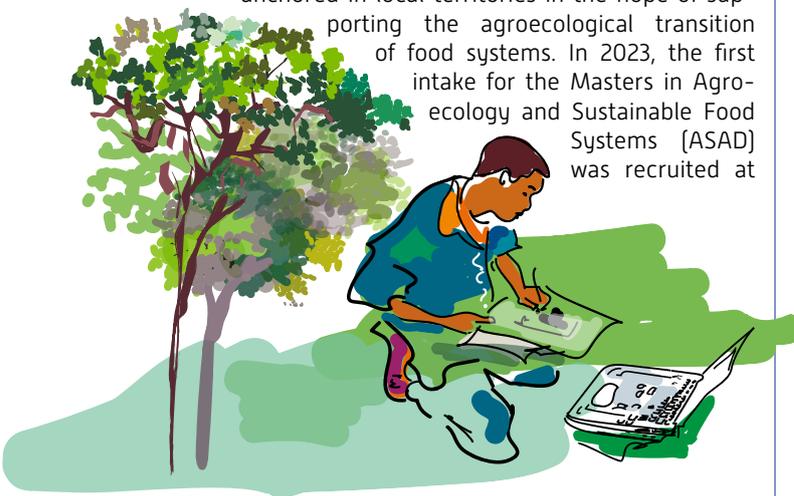
Training plays a central role in CIRAD's operations in tropical and Mediterranean countries, and is a vital link in the chain leading to positive development impacts. The LegAE project on legumes in Africa includes a vital specific training and skill building component. Other projects entirely devoted to training are making progress, such as PEA-PETTAL in Senegal, which aims to promote vocational higher education backed by the socioeconomic sector and is anchored in local territories in the hope of supporting the agroecological transition of food systems. In 2023, the first intake for the Masters in Agroecology and Sustainable Food Systems (ASAD) was recruited at

the university involved in the project (USSEIN). BIOVALOR, another project in collaboration with higher education in Africa, in this case in Benin, is geared towards professionalizing its students. A business pre-incubator was set up in 2023, and an experience-sharing and skill-building workshop was held at Abomey Calavi University with a view to providing students with business support. In Southeast Asia, the Talent programme is continuing its work in favour of tree crop plantation sustainability. The Asian partners in the programme offer summer schools, training for trainers and workshops for a varied audience, while the Talent-Lab forum allows them to build partnerships.

Training in the global South, a number of popular initiatives

CIRAD provides multi-partner teams with training in "communication for groups of partners", covering several topics, notably website building and management, writing and social media. The latest session, in Senegal in December, trained some twenty students from West Africa. The SENS research unit offers an emblematic course on climate change and biodiversity: the economic and legal instruments of economic policy, and around 15 students from Africa were trained in Montpellier in 2023. Lastly, 46 partners attended a course in comparative genomics (BigOmics) in Senegal. ■

Training session in communication for groups of partners held in Gorée (Senegal) in December 2023 (RR)



TRAINING \ From Innov'Emploi to a community of practice: modernizing training

In building a community of practice, the Training Ambition team aims to offer trainers from CIRAD a space in which to share and build their skills, to ensure ever more modern, innovative training operations.

What is Innov'Emploi ?

LUCIE LEMAGNEN: Innov'Emploi is a scheme run by the Occitanie Regional Council, aimed at encouraging training organizations to modernize, experiment and innovate. CIRAD applied for help to digitalize its training catalogue in June 2021. This was granted in the form of a training organization in Toulouse, France, Groupe Bizness, which worked with CIRAD for a year and a half to help pinpoint modernization operations. Two types of actions were proposed: on the one hand collective actions for all CIRAD staff members involved in training, and on the other, more specific support for the Training Ambition team on precise topics. Trainers received several types of support: online training, coaching in developing a hybrid (in person-online) version of a life cycle assessment training course, etc. The Training Ambition team received help with diagnosing and drafting an action plan for future projects. To quote just two examples: optimization of the CIRAD online training platform, which is now vital following the Covid lockdowns, and the creation of a community of practice for trainers.



Lucie Lemagnen and Frédéric Diez, from the CIRAD Training Ambition team, at the Paris International Agricultural Show

How did we get from Innov'Emploi to a community of practice, and what exactly is that community?

LUCIE LEMAGNEN: Innov'Emploi acted as a springboard for the community of practice, laying the foundations for the project at CIRAD. As things stood, there was a critical mass of people providing training at CIRAD, but they all worked more or less in isolation, often without calling themselves "trainers". However, training practices are evolving and becoming more professional. Innov'Emploi helped us progress in terms of a veritable roadmap leading to a community of practice.

FRÉDÉRIC DIEZ: The community of practice is one of our main tools for professionalizing the training ecosystem at CIRAD. The aim is also to discuss and standardize good practices. The community materialized in 2023 thanks to the organization in October of a first in-person seminar in Montpellier, at which 25 people were able to reflect on hybrid training and learning through play. A similar seminar is scheduled for 2024. The community of practice also means monthly 90-minute online "discovery workshops" on new tools and teaching methods, with the support of the MUSE I-site teaching initiative support centre. Each month, Lucie Lemagnen and I run "action workshops" that allow CIRAD

trainers to tackle an issue and leave having made progress. At the same time, we are working with CIRAD Human Resources to recognize the services provided by the establishment's trainers. We can already consider the community a success. Participants in workshops are glad to find answers to their questions and more confident when building training programmes. This positive feedback is proof of the need to develop our community of practice, which will be embarking on its second season with a second seminar in September 2024. ■

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Moodle,
an open access
tool



COMMUNICATION

The office is stepping up communication operations in the global South and maintaining its other operations

The recruitment of communication officers in three of CIRAD's regional offices is proof – if proof were needed – of the importance for the organization of professional communication, both in France and in tropical and Mediterranean countries.

Three new communication officers were recruited in 2023, in our regional offices in Madagascar, Senegal and Vietnam. All three were already proficient, and they have benefited from long-distance support to familiarize them with CIRAD's institutional communication standards and practices. In terms of outputs, a new season of the CIRAD podcast, *Nourrir le vivant* (Feeding the living world) was produced in 2023.



This third series, on climate and possible solutions, comprises six new episodes looking at several pathways towards more resilient farming in the light of climate change. It takes listeners on a fascinating round-the-world trip, including Burkina Faso, Colombia, Senegal, Nicaragua, Tunisia and Cambodia.

CIRAD on social media, a community of more than 130 000 followers

CIRAD's social media following continued to grow in 2023, with 24 541 new followers across Facebook, Instagram, LinkedIn, Twitter/X and YouTube. We now have 138 226 followers in all (+21.5% in a year). CIRAD shares news items, press releases, podcasts and videos on a daily basis, to promote the work of its scientists and inform donors, policymakers and partners. There were more than 1100 posts in 2023, generating 4.7 million impressions (+41.4%).



Media relations marked by two topics: forests and climate

2023 was marked by several events and topics: forests, with the One Forest Summit in Libreville, Gabon, and the Amazon Summit in Belem, Brazil, which gave rise to contributions from CIRAD experts in 70 items across around 20 media outlets. Another highlight of the year was COP28, the first COP at which health was truly represented, with strong participation on the part of the PREZODE initiative, and more than 30 contributions on the radio and in the

French national and regional press on the topic of carbon storage in forests and soils and the need to transform food systems. CIRAD was also widely quoted on the topic of climate, notably in a documentary, *Sale temps sur la planète* (Stormy weather across the planet), on the France 5 TV channel, looking at French Guiana, with a sequence at the Paracou forest research facility. In Montpellier, the press conference organized during the second World Conference on Sorghum was attended by French media France 3, RFI, *Midi Libre*, *Sciences et avenir*, *la Tribune*, etc. In Réunion, Jamy Gourmaud, a French TV journalist, filmed a report on vanilla, following on from the announcement in 2022 that the vanilla genome had been sequenced, and looking forward to the global symposium due to be held on the island in 2024. RFI also shone the spotlight on biodiversity in Réunion in two reports. Lastly, CIRAD researchers have continued their efforts to disseminate their results, with content on the *The Conversation* platform (more than 20 articles), and contributions to podcasts produced in collaboration with AFP or *Le Monde* ("Chaleur humaine") in 2023. In all, the total audience for CIRAD-related content in online media is estimated at 7.4 billion contacts potentially exposed to almost 4000 references to CIRAD, and 1 billion to a selection of 583 quality references in French, all media combined (see graph).

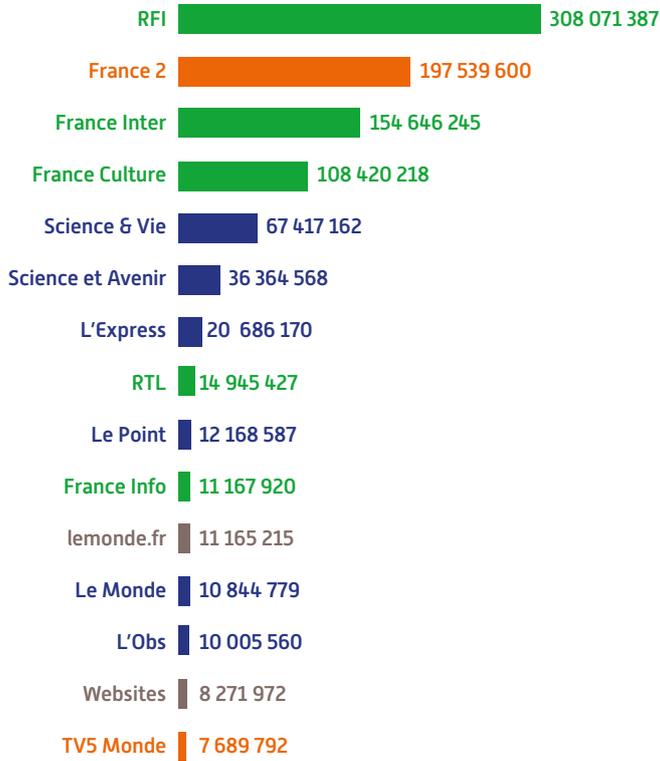
Institutional communication and advocacy

In terms of institutional communication, the *cirad.fr* website is looking to reach a new audience with the launch of new content translated into Spanish and Portuguese for CIRAD's regional offices for "Brazil and southern cone countries" and "Mexico, central America and the Andean countries". Five research units – AIDA, BioWooEB, Forests and Societies, GECO and HORTSYS – have had a complete redesign of their websites, with a new layout in line with that of *cirad.fr*. On an editorial level, six main documents were produced in 2023: the 2022 annual report, a position paper ("CIRAD is committed to the future of tropical forests"), the "Sustainable development and social responsibility" blueprint, and three value chain roadmap summaries (rice, roots and tubers, and cotton).

All of these documents are available in the Document library on cirad.fr.



Impact in terms of audience across a selection of 583 quality references in French in 2023



Events: all eyes on a documentary, a visible presence at global events

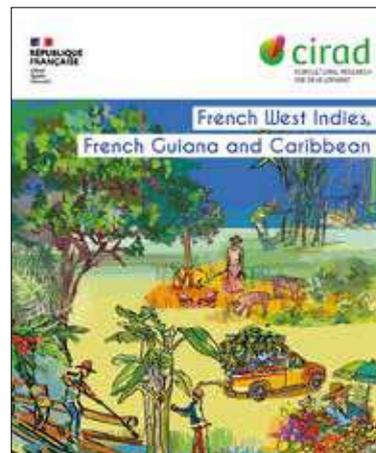
The highlights of the year include CIRAD's participation in a number of recurrent events: International Science Festival, Rencontres du développement durable, Paris International Agricultural Show, Sud de Sciences Festival. On the global stage, CIRAD participated in the Salon de l'agriculture et des ressources animales (SARA) in Abidjan, and co-organized the second World Conference on Sorghum in the 21st Century in Montpellier in June. It also took part in the COP28 climate conference in Dubai, UAE, from 30 November to 12 December 2023. This was a chance to promote the results of its extensive research to both politicians and other participants. A film, "Amazonie brésilienne, un autre regard" ["A fresh look at the Brazilian Amazon"], co-produced by



CIRAD, was shown at the opening of the Sud de Sciences Festival, where it won the prize for the best documentary film at the FestiFrance Festival. It also competed in the ECOCINE International Environmental and Human Rights Film Festival in Brazil from 3 November to 3 December.

In-house communication: the "Rencontres" have upped their game

With CIRAD's recruitment of around a hundred new people per year over the past four years, the in-house communication team is continuing its efforts to bring CIRAD staff on board by means of various events, the highlight being its annual convention, the "Rencontres" ("Meetings"). The aim is to build a shared culture around values such as solidarity and sharing, on which CIRAD is founded and which extend well beyond France, with staff members based across three continents. The 2023 edition welcomed an inspiring "grand témoin" ("great witness"), the economist Eloi Laurent. The Rencontres also included a new feature, the *Village des initiatives* (Initiatives village), showing CIRAD's flagship activities, which proved very popular. Those activities included one of the in-house communication team's main outputs, six video portraits of people with unusual jobs at CIRAD, which were produced and shown in house and on social media. Those videos have made an excellent job of boosting the visibility and recognition of our colleagues and the organization as a whole. ■



2023 PUBLICATIONS

2023 saw a wealth of publications of different types by CIRAD and its partners: scientific works and studies, a co-published guide, as well as policy briefs, and more...

There is a selection below, and you can find out more on our website (cirad.fr) and that of Editions Quæ, of which CIRAD is a co-founder (quae.com).

Policy briefs and reports

Healthy soils for carbon-neutral food systems

Experts from CIRAD, IRD and the "4 per 1000" international initiative recall the vital importance of healthy soils if food systems are to achieve the target of net zero CO₂ emissions. This policy brief, which makes recommendations for policymakers, was published a few days ahead of COP28.

Healthy soils sustain food system transformations to contribute to the net zero CO₂ emission target by 2050, Chotte J.L. (IRD), Barot S. (IRD), Blanchart E. (IRD), Blanfort V.(CIRAD), Brauman A. (IRD), Cardinael R. (CIRAD), Chevallier T. (IRD),

Demenois J. (CIRAD), Lardy L. (IRD), Luu P. (4P1000 Initiative), Masse D. (IRD), Trap J. (IRD), Wadoux A.M.J.C. (IRD), October 2023, 2 p.



Carbon balance of our food systems. Enhance the vision of Sahelian pastoral livestock farming within the negotiation arenas

This policy brief takes stock of the latest research results concerning the carbon balance of the pastoral livestock sector in the Sahel. The work in question, published by the Institut sénégalais de recherches agricoles (ISRA) and CIRAD, was done under the CaSSECS project, funded by the EU DeSIRA programme and coordinated by ISRA.

Carbon balance of our food systems. Enhance the vision of Sahelian pastoral livestock farming within the negotiation arenas, COP28 - Dubai

Policy Brief, , Marié F. (CIRAD), Assouma M.H. (CIRAD), Diop M. (ISRA), Traoré E.H. (ISRA), Salgado P. (CIRAD), December 2023, 2 p.



Biodiversity and pandemics: what are the priorities for research and action?

A synthesis report of the available knowledge of biodiversity and pandemics, by a group of nine international experts including CIRAD's Alexandre Caron, makes four recommendations for building research programmes at the interface between human, animal and ecosystem health.

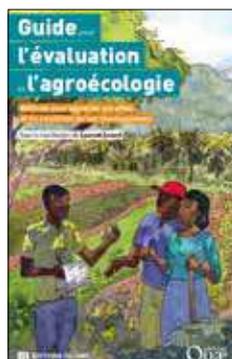
Biodiversity and pandemics : Interdisciplinary research and action priorities. Eklipse Evidence Report, Jagadesh S., Caron A., Lajaunie C., Turan H. M., Bunnefeld,N., Cunningham A., Fernandez M., Scott A., Tchouaffe Tchiadje N.,

Izdebski A., Shapiro J.T., 2023, 107 p.

DOI: 10.5281/zenodo.10640533



Co-publication



A guide to assessing agroecology and the conditions for its development

This concise practical guide is intended to support decisions on the part of the various stakeholders involved in the agroecological transition. It offers agro-environmental and socioeconomic assessment forms relating to agroecology and the conditions for its development.

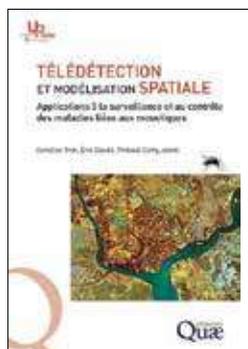
Guide pour l'évaluation de l'agroécologie. Méthode pour apprécier ses effets et les conditions de son développement. L. Levard (scientific coordination), Editions Quæ - les éditions du Gret co-publication, February 2023, 320 p.

Scientific works and studies

Remote sensing and spatial modelling of mosquito-borne diseases

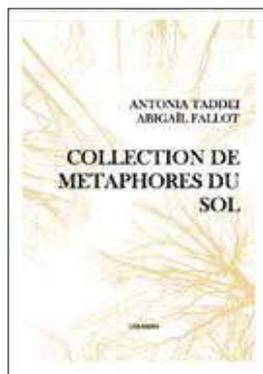
This book presents a summary of what remote sensing and spatial modelling can bring to the development of tools to monitor and control vector mosquito populations and associated diseases (malaria, dengue, yellow fever, chikungunya, zika). It is intended for students and researchers, as well as public health players.

Télédéttection et modélisation spatiale. Applications à la surveillance et au contrôle des maladies liées aux moustiques, scientific coordinator: Tran A., Daudé É., Catry T., Editions Quæ, Update Sciences & technologies collection, November 2022, 148 p.



Staying with metaphors to share our visions of soils and foster dialogue

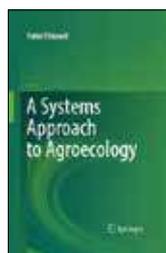
A sea, a mother, a battery, and many more... Antonia Taddei and Abigail Fallot have listed more than 120 metaphors relating to the soil, collected during workshops and interviews in Senegal, Zimbabwe and France.



Collection de métaphores du sol, Taddei A., Fallot A., éditions Cabanera, May 2023, 197 p.

A Systems Approach to Agroecology

Agroecology is gaining momentum in the international research-for-development arena. This means there is an urgent need for methods and tools to support the co-design and evaluation of agroecological systems and their transitions. This book by CIRAD researcher Pablo Tittonnell gives insights into the methodologies available.



A Systems Approach to Agroecology, Tittonnell P., Springer Nature Switzerland, October 2023, 393 p. <https://doi.org/10.1007/978-3-031-42939-2>

Rethinking innovation in terms of "doing without, doing with less"

Faire sans, faire avec moins - Les nouveaux horizons de l'innovation, published in French in 2022, is now available in a supplemented English version entitled *New Horizons for Innovation Studies - Doing Without, Doing With Less*. Its authors, sociologists of innovation Frédéric Goulet from CIRAD and Dominique Vinck from the University of Lausanne, take a deep dive into the changes in how we produce and consume, and show how those changes mean rethinking how we conduct innovation.

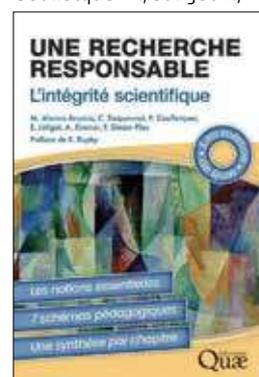


New Horizons for Innovation Studies - Doing Without, Doing With Less, Goulet F. and Vinck D., Edward Elgar Publishing, Sociology, Social Policy and Education 2023 collection, 2023, 332 p.

Scientific integrity is the cornerstone of responsible research

Scientific integrity is the cornerstone of responsible research. It ensures the robustness and reliability of the knowledge generated, and serves to maintain public confidence in science. Éditions Quæ recently published a book that recaps on the fundamental principles of scientific integrity.

Une recherche responsable. L'intégrité scientifique, Alunno-Bruscia M., Duquenno C., Goulletquer P., Jaligot E., Kremer A.,



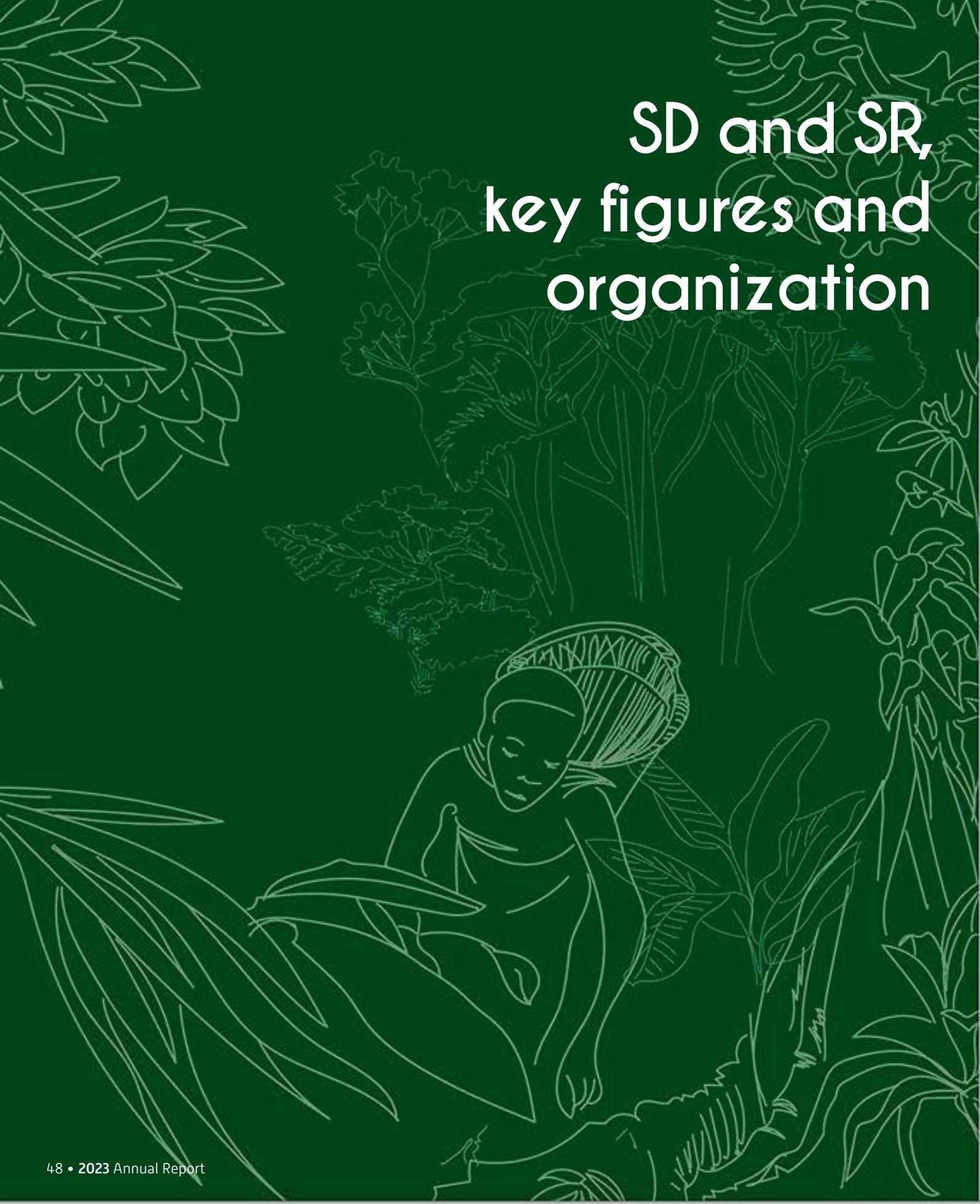
Simon-Plas F., Ruphy S. (preface), Editions Quæ, Les mémos de Quæ collection, September 2023, 64 p.



<https://partage-connaissances.cirad.fr/en>



<https://www.quae.com/>



SD and SR, key figures and organization

A proactive approach prompted by the climate crisis

The INRAE-CIRAD-IFREMER-IRD Ethics in Common Committee addresses the ethical issues that may be raised by research in France and overseas, in the fields of food, agriculture, the sea, the environment and sustainable development, particularly those that concern the relationships between science and society.

In 2023, the Ethics in Common Committee published its 15th statement: *Quels droits et devoirs pour les scientifiques et leurs institutions face à l'urgence environnementale ?* [What rights and duties do scientists and their organizations have in the light of the environment crisis?]. The statement was self-initiated by the committee following a message from a researcher on the Ethics in Common website in late September 2022. In its current form, the statement is the result of contacts with staff members from all four organizations, contributions from several teams, a collective debate session in Nantes, France, with local research teams, and discussions with the heads of the organizations. An exchange was also established with the CNRS Ethics Committee (Comets), which has issued two statements on environmental issues (nos. 2023-43 and 2023-45). The Ethics in Common Committee statement is an update on the committee members' current position and nothing more: the committee invites anyone who reads it to contribute their comments and ideas, to enable it to fine-tune or supplement the current text in the coming months.

In 2023, the Ethics in Common Committee held a plenary meeting in Paris in November. Its members chose to look at a new referral concerning the ethical issues surrounding participatory science and research. They questioned researchers from IRD and CIRAD specializing in the topic and are due to continue their interviews in January 2024 with staff members from INRAE and IFREMER. The committee has produced a context map for this latest referral. ■

Find out more

Ethics in Common website:



Download statement no. 15:



SD and SR

A blueprint that is on track

“Sobriety” is the watchword for the establishment, which in 2023 continued to roll out its blueprint for sustainable development and social responsibility. With a reinforced steering and participation mechanism, the project, with its multiple ramifications, progressed throughout 2023. New people with new responsibilities, with a new steering mechanism... the definitive blueprint is now being put into practice. In terms of mobility, energy and digital technology, sobriety is the watchword.

Changes in the steering and participation mechanism

Following the dissemination of the 2022-2023 “sustainable development and social responsibility” blueprint to CIRAD’s staff and partners, an “environmental transition” advisor to the Director General in charge of Resources and Organization was appointed and an “environmental transition” committee set up. The “environment” unit within the Installations and Maintenance Service (Ditam), for its part, has been reinforced. The RespiRES project (responsibility of research institutes in terms of ecological and social issues), which was co-designed by CIRAD staff members from both research and support units, supported by General Management, has suggested an inter-institutional vision. Its overall aim is to build a space for dialogue, resources and for testing solutions to the ecological and social emergencies for management, services and staff from organizations and higher education establishments in Montpellier. The topics covered range from reducing the carbon footprint of research operations to taking account of the psychosocial factors associated with the ecological transition and climate risks, or the ethics of environmental responsibility.

Responsible mobility

Greenhouse gas emissions as a result of business travel are twice those generated by energy consumption. The responsible mobility commitment, which includes a reminder of travel rules such as choosing the train and reducing car travel, has been widely promoted. An app developed by CIRAD, CiO2, has been launched with the aim of reducing carbon emissions due to the home-work commute, business trips, expatriation, etc (estimation of emissions, journey simulations, good practice sharing, etc). On a local scale, the establishment has produced mobility schemes for each of its sites, and has signed an agreement for the establishment of a sustainable mobility grant of up to € 300 that as of 2024 will serve to encourage

its employees to switch to more responsible travel. In Montpellier, more cycle parking facilities have been installed and a social, solidarity economy association regularly brings a mobile cycle repair workshop to CIRAD’s different sites. Activities were organized during European Mobility Week in September. In addition to promoting a partner app to facilitate car sharing, events have been organized to put staff members living in a given geographical area in touch with others. As regards long-distance travel, the establishment is continuing with a participatory, iterative process aimed at building on air travel carbon offset experiments, an inherent part of CIRAD’s remit. “Ma Terre en 180 minutes” (My planet in 180 minutes) workshops, developed by the Labo1.5 research group, are being rolled out, encouraging people to train as session leaders. Development of a real-time monitoring and mapping dashboard (projects, reasons and units) for the use of CIRAD management, to track the carbon footprint of long-distance travel, is continuing, for launch in 2025.

Boosting our energy sobriety by involving everyone

Thanks to the rollout of CIRAD’s energy sobriety plan and the efforts made by its services and units, it reached its objectives a year ahead of target, in late 2023. The reduction in consumption of all types of energy across all sites (including the French overseas regions) reached 14.6%, which corresponds to a greenhouse gas emission reduction of 477 tCO2e. Approaches aimed at including users are being developed with the three research units whose infrastructures consume the most energy. CIRAD has also committed to the CUBE national challenge, with a first pilot building (B building on its Baillarguet site). For 12 months, a “Green Team” comprising both enthusiastic occupants of the building and people in charge of operations and maintenance will be working to identify appropriate energy saving mechanisms. Solar power projects have been launched in Martinique and Réunion, and others are planned for Montpellier.



Adapting consumption habits for greater sustainability

A responsible purchasing officer has been appointed and everyone involved in purchasing has been trained in SD and SR. Seventy-seven per cent of our purchasing contracts include environmental clauses, pending the 100% target set by the national sustainable purchasing plan by 2025. A sustainable purchasing plan is currently being drafted. The office and rest break room waste sorting system has been modernized, with the rollout of a new system comprising voluntary disposal points to ensure more recycling by local and national organizations. In Montpellier, two pilot mini-composters have been installed to see whether the practice could be expanded. Reusable glass containers on which a refundable deposit is paid are now being used to reduce the amount of waste generated by takeaway meals from the Montpellier canteens.

Preserving biodiversity

The establishment is keen to ensure biodiversity preservation and promotion at all of its installations, by means of a biodiversity plan for each campus. Stopping the use of chemical pesticides to maintain green spaces, using biological control in its experimental greenhouses, and bespoke management of green spaces including late mowing will be continued. In 2023, the BiodiverCirad group organized a “bioblitz” at CIRAD’s Montpellier sites to record as many living organisms as possible using citizen science apps, one of which was developed by CIRAD (Pl@ntNet), and with support from wildlife and flora specialists. To date, more than 400 species have been recorded on the Montpellier campuses.

Opting for more sobre digital technologies

CIRAD is prioritizing the two measures with the greatest impact in terms of digital technologies (data centre terminal manufacture).

Between 2020 and 2024, the establishment will have entirely transferred its data centre to the eco-friendlier Occitanie data centre, which will allow an energy saving of at least 25% compared to current levels. Moreover, the computer replacement period has been extended to 5.5 years, the maximum guarantee period. The new digital technology blueprint, focusing on greater sobriety, is currently being drafted.

The CIRAD institutional video won a trophy at the Deauville Green Awards International Festival for Responsible Film in the “Agriculture and sustainable resources” category of the “Info” competition. This three-minute video, which was made with very little environmental impact, highlights CIRAD’s engaged research and its staff. Our promotional “goodies” now satisfy three criteria: recyclable materials, local, ethical production, and responsible use. CIRAD recommends that they be used reasonably, when necessary, rather than being given out systematically at events.

Boosting transparency and ethics and reducing professional risks

In a drive to continue to improve its stances and practices, CIRAD is setting up a centralized structure to record warnings of confirmed or potential risks relating to its activities. It is a web platform that compiles various types of warnings: discrimination, harassment, health and environmental risks, lawbreaking, impropriety, breaches of scientific integrity or ethics, etc. The platform is accessible not just to CIRAD staff members, but also to people received at CIRAD, such as students or partners, or from outside CIRAD (suppliers, customers, subcontractors, administrators, etc). All requests registered on the platform are analysed by the contact persons for each field, and handled confidentially, securely and transparently, to provide an appropriate response to the issue in question. ■

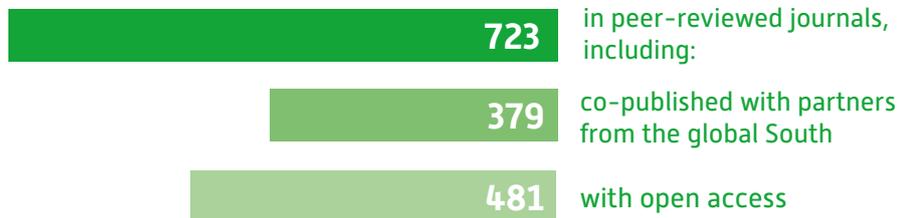


2023 key figures

SCIENCE

Number of articles published*

* Source Agritrop, figures as of 31 January 2024



16 projects helped to boost impact by



3 change assessments

PARTNERSHIP

Number of senior scientific staff members on assignment outside mainland France in 2022 (in FTEs*)

* FTE: full-time equivalent Source: SIRH-DGDRD, as of 31 December 2023

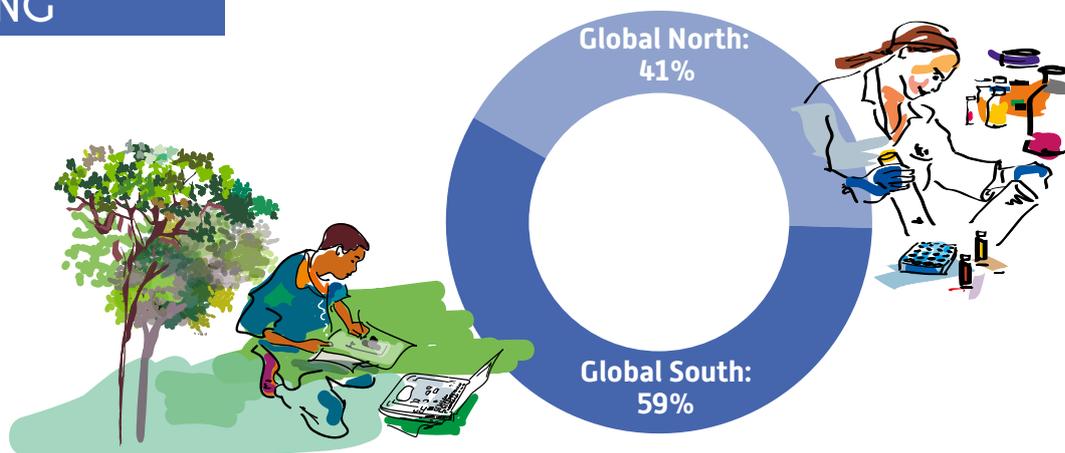


20 platforms in partnership for research and training with national and international institutions in tropical and Mediterranean countries

TRAINING

426 PhD students supervised by CIRAD in 2023

Source SIRH -DGDRD



2023 key figures

PROJECTS

CIRAD manages a portfolio of **926 active multi-year projects**

In 2023, **372 projects** were signed:

29% with public research donors

25% with public development donors

29% with private donors

17% with overseas territorial authorities



110 new project agreements signed with socioeconomic players

IN A NUTSHELL

CIRAD employs

1800 people,

including **1140 scientific staff members,**

of whom **800 are researchers**



* French State gender equality score

Annual budget

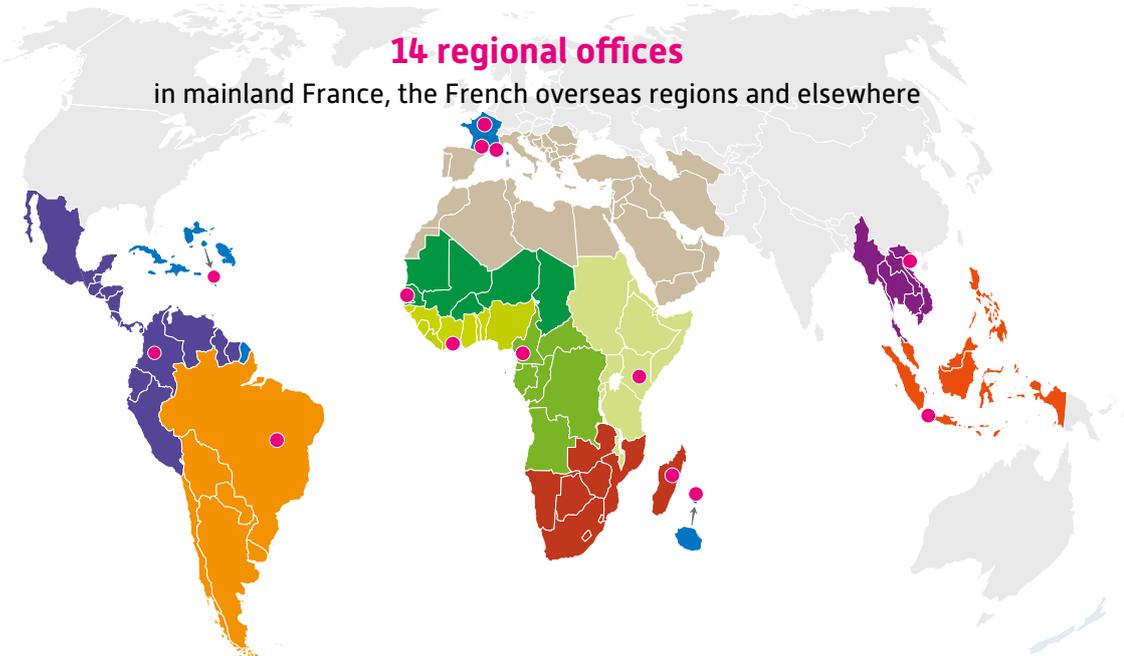
240 M€

Contractual resources **40%**

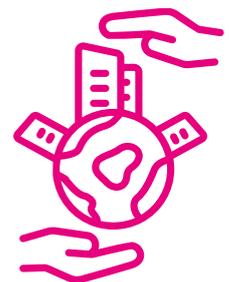
Public service subsidy **60%**

14 regional offices

in mainland France, the French overseas regions and elsewhere



200 partner institutions



Organization chart (as of 31 December 2023)



INRAE-CIRAD-IFREMER-IRD
"Ethics in Common" Committee
Chair **Michel BADRÉ**

Ethics and Research Integrity Office
Estelle JALIGOT

Science Council
Chair **Gilles KLEITZ**

Works Council (CSE)
Secretary **Pierre DEFAUT**

Director General in charge of
Resources and Organization (DGD-RD)
Anthony FARISANO

▼
Performance of Tropical Production
and Processing Systems Department
(PERSYST)
Jean-Paul LACLAU

▼
Environments and Societies
Department (ES)
Sylvain PERRET

▼
PERSYST

UPR AIDA
Krishna NAUDIN
UMR ABSYS
Bruno RAPIDEL
US Analyses
Marie TELLA
UPR BioWooEB
Jean-Michel COMMANDRÉ
UMR Eco&Sols
Laurent CURNAC (IRD)
UPR GECO
Luc DE LAPEYRE
UPR HortSys
Fabrice LE BELLEC
UMR ISEM
Nicolas GALTIER
(University of Montpellier)
UMR QUALISUD
Dominique PALLET
UPR Recycling and Risk
Frédéric FEDER

▼
ES

UMR ART-Dev
Denis PESCHE
UMR CIRED
Franck LECOCQ (Agro Paris Tech)
UMR ECOFOG
Stéphane TRAISSAC
(AgroParis Tech)
UPR F&S
Plinio SIST
UMR G-EAU
Marcel KUPER
UMR INNOVATION
Jean-Marc TOUZARD (INRAE)
UMR MOISA
Paule MOUSTIER
UMR SENS
Philippe MÉRAL (IRD)
UMR SELMET
Guillaume DUTEURTRE
UMR TETIS
Pierre MAUREL (INRAE)

See the list of research units with full names on page 58

Regional Offices in mainland and overseas France

Île-de-France: **Anthony FARISANO**
Montpellier – Occitanie: **Vincent FABRE-ROUSSEAU**
French West Indies, French Guiana
and Caribbean: **Magalie JANNOYER**
Réunion, Mayotte and Indian Ocean: **Éric JEUFFRAULT**

Accounts and Finance Service
Thierry COULOUMIES

Human Resources Service
Estelle ROSE

Installations and Maintenance Service
Arthur GOUBET

Information Systems Service
Laurence ROUSEAU

Legal Affairs Office
Alexandrine REY

Health and Safety Office
Tiffany GASTINEAU

Archives Office
Yann COMBOT

Procurement Office
Malaurie SALLES

Management Control Office
Pierre-Jean BALLARD

Head of Security and Defence
Patrice GUILLAUME

General organization (as of 31 December 2023)

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Chair

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of Education and Research

Agathe Rolland, representing the Ministry
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Benoit Bonaimé, representing the Ministry of
Agriculture and Food Sovereignty

Thierry Blandinières, Managing Director
of the agricultural cooperative group In Vivo

Philippe Mauguin, President, Institut national
de recherche pour l'agriculture, l'alimentation
et l'environnement (INRAE)

Josefa Leonel Correia Sacko, African Union
Commissioner for Rural Economy and
Agriculture

Mariam Sow, Executive Secretary, ENDA Pronat

Valérie Verdier, Chairman of the Board and CEO,
IRD

Bertrand Walckenaer, Deputy Director General,
Agence française de développement (AFD)

Elected staff representatives

Thomas Balenghien

Nathalie Cialdella

Françoise Gérard

François-Régis Goebel

Thibaud Martin

Laurence Ollivier

Secretariat

Alexandrine Rey, Secretary

Participants as of right, in an advisory capacity

Béatrice Avot, Controller for Economy and
Finance, Ministry of Education, Research and
Innovation

Anthony Farisano, Director General
in charge of Resources and Organization, CIRAD

Pierre Defaut, Secretary, Works Council, CIRAD

Yves Delmas, Auditor

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University of Louvain (Belgium)

Carole Caranta, Deputy Director General of
Science and Innovation, INRAE (Paris, France)

Dao The Anh, Vice-President, Vietnamese
Academy of Agricultural Sciences (VAAS)

Diana Fernandez, Researcher, IRD,
Plant Health Institute Montpellier (PHIM),
(Montpellier, France)]

Anyangwe Florence Angaba-Fonteh, Professor,
Dschang University, Vice-Dean for Research
and Cooperation, Faculty of Agronomy and
Agricultural Sciences, University of Bamenda
(Cameroon)

Catia Grisa, Tutor and researcher, Federal
University of Rio Grande do Sul (UFRGS)
(Porto Alegre, Brazil)

Olivier Gros, University Professor of Biology of
Organisms, University of the French Antilles

Tahiana Ramanantoandro, Head, Department
of Forestry and Environment, École supérieure
des sciences agronomiques (ESSA), University
of Antananarivo (Madagascar)

Joe Tohme, Director, Crops for Nutrition
and Health Programme, Alliance of Bioversity
International and CIAT (Cali, Colombia)

Elected staff representatives

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William's Daré, Vice-Chair of the Science
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Driss Ezzine de Blas

Paule Moustier

Virginie Ravigne

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Alexia Prades (DGD-RS)

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Michel Badré, Engineer, former president
of the Environmental Authority (2009-2014),
former member (2015-2021) and vice-president
(2018-2021) of the Economic, Social and
Environmental Council (EESC) as part of the
environmental associations group.

Bernadette Bensaude-Vincent, vice-chair
of the Committee, Professor emeritus of the
philosophy of science and technology at
the University of Paris 1 Panthéon-Sorbonne

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Paris École des Mines (Sociology of Innovation
Centre); engineer from the Paris École des
Mines. Doctor in socio-economics of innovation

Catherine Boyen, Director of research at
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Bernard Bret, Geographer, specializing in Latin
America and more particularly Brazil. Former
professor at the University of Lyon III

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Doctor in evolutionary sciences and ecology

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associate professor at the Paris Institut des
Mines-Télécom and at the EHESS; member
of the Orange Ethics Committee; Doctor of
Philosophy

Paula Martinho da Silva, Lawyer specializing in
intellectual property and life sciences. Member
of the International Bioethics Committee
(UNESCO), member of the Ethics Committee
of the Champalimad Foundation and of the
University Hospital of Lisbon Centre

Marie-Geneviève Pinsart, Philosopher, professor
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center for applied ethics; member of the IRD's
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in Partnership (CCERP)

Pere Puigdomènech, Research professor at the
Higher Council for Scientific Research (CSIC) at
the Institute of Molecular Biology in Barcelona.
Doctor of Biological Sciences, specialising in the
molecular biology of plants)

Ricardo Serrão Santos, Biologist, Professor
at the University of the Azores. Permanent
member of the Portuguese Academy of
Sciences and Emeritus member of the
Portuguese Academy of the Navy. Former
pro-rector at the University of the Azores, and
President of IMAR (Interuniversity Institute of
Marine Research) in Portugal. Former Member
of the European Parliament and Minister for the
Sea

Yokouba Sokona, Vice-Chairman of the Intergovernmental Panel on Climate Change (IPCC); Member of the African Academy of Sciences; Coordinator of the African Climate Policy Centre (ACPC)

Laurent Thévenot, Economist and sociologist. Director of studies at EHESS (Chair: Pragmatic Sociology of Politics and Morals), member of the Georg Simmel Centre, and member of the French Academy of Agriculture. Senior Engineer at the École Polytechnique and ENSAE

Secretariat

CIRAD, **Estelle Jaligot**

INRAE, **Christine Charlot** and **Claire Lurin**

IFREMER, **Marianne Alunno-Bruscia**

IRD, **Ghislaine THIRION**

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Chief Executive Officer

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Marie-Laurence Pouxviel,
Head of Communication

Jean-Michel Vassal,
Head of Evaluation Systems

Estelle Jaligot,
Head of Ethics and Research Integrity

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Sélim Louafi, Deputy Director General

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Marketing Service

Sloan Salètes, Deputy Manager, Research
Impact and Marketing Service

Inese Rozensteine, Head, Europe Office

Tanguy Lafarge, Head of Partnerships

Anne Toulet, Head of Scientific Information
and Open Science

Danielle Lazuttes, Head of Incentive Operations

Cathy Grevesse, Head of Quality, Social
Responsibility and Research Infrastructures

François-Xavier Côte, Head of Tropical Value
Chains

Thierry Leroy, Regional Director,
Central Africa

Patrice Grimaud, Regional Director,
East Africa

Jean-Marc Bouvet, Regional Director,
Southern Africa and Madagascar

Ibra Touré, Regional Director
West Africa - Dry Zone

Serge Marlet, Regional Director,
West Africa - Forest and Humid Savannah

Pierre Marraccini, Regional Director,
Brazil and Southern Cone Countries

François Roger, Regional Director,
Continental Southeast Asia

Jean-Marc Roda, Regional Director,
Southeast Asian islands

Sandrine Dury, Regional Director,
Mediterranean and Middle East

Philippe Vaast, Regional Director, Mexico,
Central America and Andean countries

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Montpellier-Occitanie

Nathalie Séguret, Deputy Regional Director,
Montpellier-Occitanie

Magalie Jannoyer, Regional Director, French
West Indies, French Guiana and Caribbean

Éric Jeuffrault, Regional Director,
Réunion-Mayotte and Indian Ocean

Jean-Cyril Dagallier, Deputy Regional
Director, Réunion-Mayotte and Indian Ocean

Isabelle Mialet-Serra, Deputy Regional
Director, Réunion-Mayotte and Indian Ocean

Thierry Couloumies, Manager,
Accounts and Finance

Sophie Gavelle, Deputy Manager, Accounts
and Finance, in charge of Central Accounts
and Finance Services

Benoît Cervello, Deputy Manager, Accounts
and Finance, in charge of Decentralized
Accounts and Finance Services

Estelle Rose, Manager, Human Resources

Claire Roche, Deputy Manager,
Human Resources

Laurence Rouseau, Manager, Information
Systems

Arthur Goubet, Technical Manager, Installations
and Maintenance

Alexandrine Rey, Deputy Head, Legal Affairs

Yann Combet, Head, Archives Office

Malaurie Salles, Head of Purchasing

Pierre-Jean Ballard, Head, Internal Auditing
and Performance Office

Tiffany Gastineau, Head of Health and Safety in
the Workplace

Patrice Guillaume, Head of Security and Defence

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Martijn ten Hoopen, Deputy Director

Guilhem Lacombe, Assistant Director

David Berthier-Teysedre, Assistant Director

PERFORMANCE OF TROPICAL PRODUCTION AND PROCESSING SYSTEMS DEPARTMENT (PERSYST)

Jean-Paul Laclau, Director

Éric Justes, Deputy Director

Sylvie Mouras, Assistant Director

Samira Sarter, Assistant Director

ENVIRONMENTS AND SOCIETIES DEPARTMENT (ES)

Sylvain Perret, Director

Denis Gautier, Deputy Director

Pascal Bonnet, Assistant Director

Sandra Vander Stuyft, Assistant Director



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Biological Systems (BIOS) Department

Animals, Health, Territories, Risks, Ecosystems (UMR ASTRE)

Botany and Modelling of Plant Architecture and Vegetation (UMR AMAP)

Centre for Biology and Management of Populations (UMR CBGP)

Diversity-Adaptation-Development of Plants (UMR DIADE)

Genetic Improvement and Adaptation of Mediterranean and Tropical Plants (UMR AGAP)

Host-Vector-Parasite-Environment Interactions in Neglected Tropical Diseases due to Trypanosomatids (UMR INTERTRYP)

Laboratory of Tropical and Mediterranean Symbioses (UMR LSTM)

Plant Communities and Biological Invaders in Tropical Environments (UMR PVBMT)

Plant Health Institute Montpellier (UMR PHIM)



Performance of Tropical Production and Processing Systems (PERSYST) Department

Agroecological Functioning and Performances of Horticultural Systems (UPR HORTSYS)

Agroecology and Sustainable Intensification of Annual Crops (UPR AIDA)

Biodiversified Agrosystems (UMR ABSys)

Biomass, Wood, Energy, Bioproducts (UPR BioWooEB)

Ecological Functioning and Sustainable Management of Banana and Pineapple Cropping Systems (UPR GECO)

Functional Ecology and Biogeochemistry of Soils and Agrosystems (UMR Eco&Sols)

Institute of Evolution Sciences of Montpellier (UMR ISEM)

Integrated Approach to Food Quality (UMR QUALISUD)

Recycling and Risk (UPR Recyclage et risque)

Water, Soil and Plant Analysis (US Analyses)



Environments and Societies Department (ES)

Actors, Resources and Territories in Development (UMR ART-Dev)

Centre for International Research on Environment and Development (UMR CIRED)

Ecology of the Forests of French Guiana (UMR ECOFOG)

Forests and Societies (UPR Forêts et Sociétés)

Innovation and Development in Agriculture and Food (UMR Innovation)

Knowledge, Environment and Societies (UMR SENS)

Land, Environment, Remote Sensing and Spatial Information (UMR TETIS)

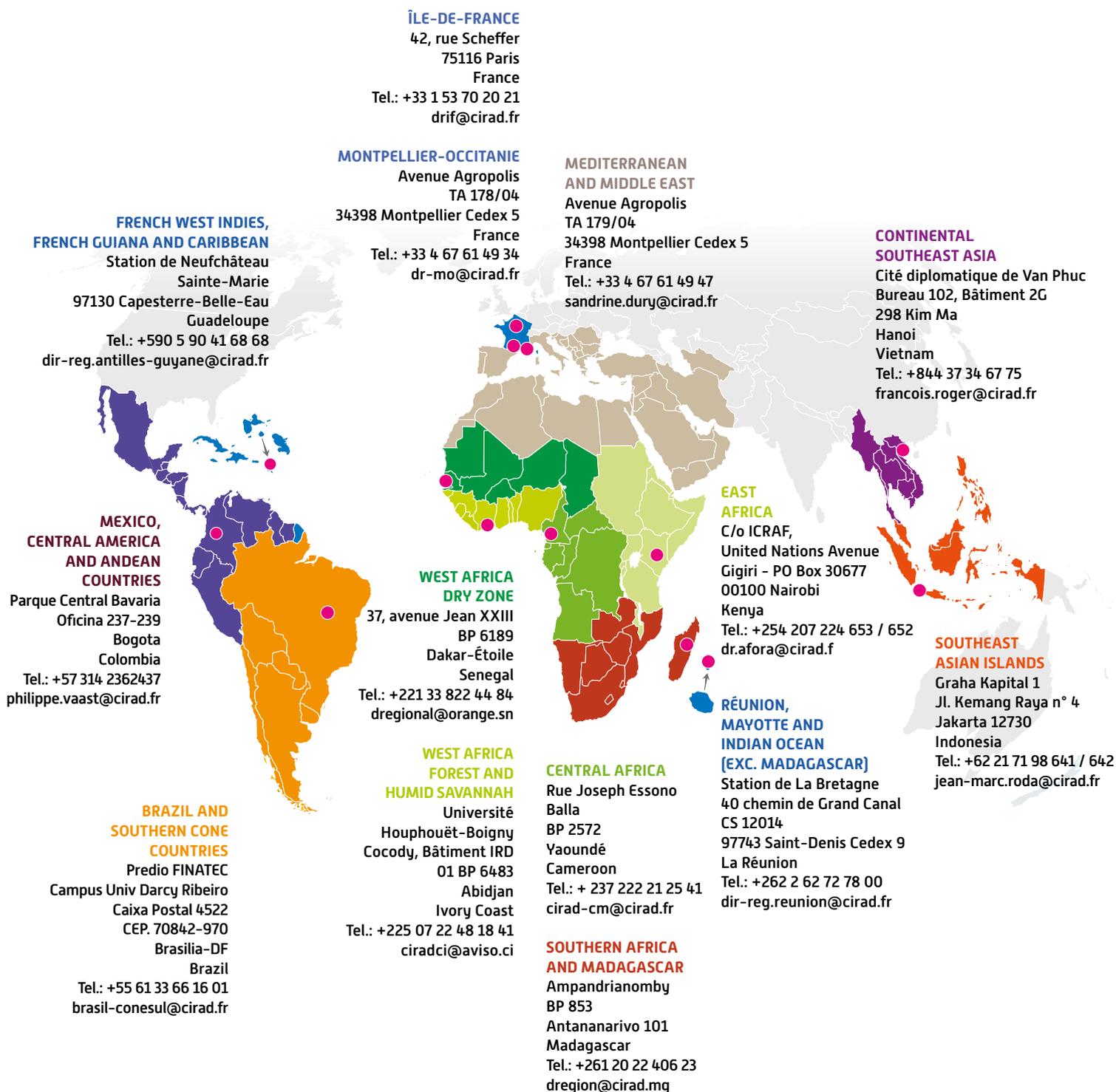
Montpellier Interdisciplinary center on Sustainable Agri-food systems (social and nutritional sciences) (UMR MOISA)

Mediterranean and Tropical Livestock Systems (UMR SELMET)

Water Management, Actors, Territories (UMR G-EAU)



UMR: Joint research unit • UPR: Internal research unit • US: Service unit





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