

Science based policy tools for sustainable development

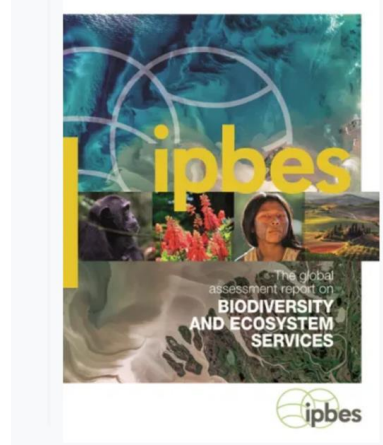
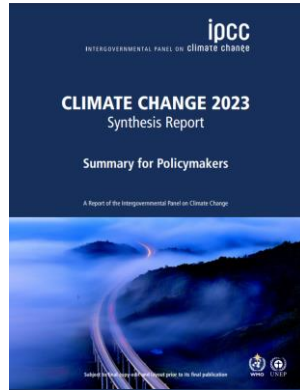
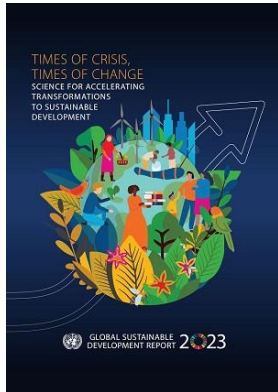
Principles and concrete examples on agriculture and climate change challenges from French research institutes



➤ Science – Policy interface

How to connect science and policy for sustainable development ?

Many ways, among which mobilising existing scientific knowledge via *scientific knowledge synthesis* : GSDR, IPCC, IPBES, HPLE...



➤ **Collective Scientific Assessment (CSA)**

A science-policy interface

Provide a detailed **state of scientific knowledge** on specific sustainable development challenges, in various contexts, as well as **guidance for policies and actions**

At the instigation of **national or international institutions** (ministries, development agencies, fundraising entities...)

A rigorous and co-constructed process

- ◊ **Support evidence-based decision making** (elaboration of mid to long term strategic action plan, development programs...)
- ◊ **Facilitate dialogue with stakeholders**



IRD: Working together, differently



26% of employees
outside
metropolitan
France

More than 150
Young Associated
Teams (JEA)
financed since 2002

More than 50
International Joint
Laboratories (LMI)
financed since 2009

More than 750 research
grants for a thesis
in the South (ARTS)
financed since 1999

IRD: Key figures



2186
EMPLOYEES

902 researchers
1 284 engineers and technicians
including 232 local permanent employees



26%
OF EMPLOYEES
are assigned outside
mainland France

120

SOUTH-NORTH MOBILITIES



14

SOUTH-SOUTH MOBILITIES



76

RESEACH UNITS



120

SOUTHERN RESEARCH TEAMS



130

ARTS PROGRAM STUDENTS



5707

PUBLICATIONS

in the perimeter of IRD research units



61%

CO-PUBLICATIONS

with a partner from the global south



€ 248.6
MILLION BUDGET

€ 42,3 million of resources
on research contracts

- Under the joint authority of the French Ministry for higher education and research and French Ministry for Europe and foreign affairs
- Contributing to French **scientific diplomacy** and policies for development
- Acute knowledge of the global South and an **equitable partnership** model

INRAE: Key figures

Our staff
11,000+ people

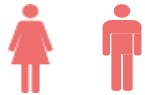
Our people includes

2,000+ researchers

3,150+ engineers

2,900+ technicians

And PhD candidates, post doc, interns



51% 49%

72% tenured staff

28% contractual staff

Budget
€ 1071 million



public service subsidy
own resources



Structure
14 scientific divisions



- Agronomy & Environment
- Plant Biology & Breeding
- Plant Health & Environment



- Animal Genetics
- Animal Physiology & Livestock System
- Animal Health



- Human Nutrition & Food Safety
- Food & Bioproducts Sciences
- Microbiology of Food Chain



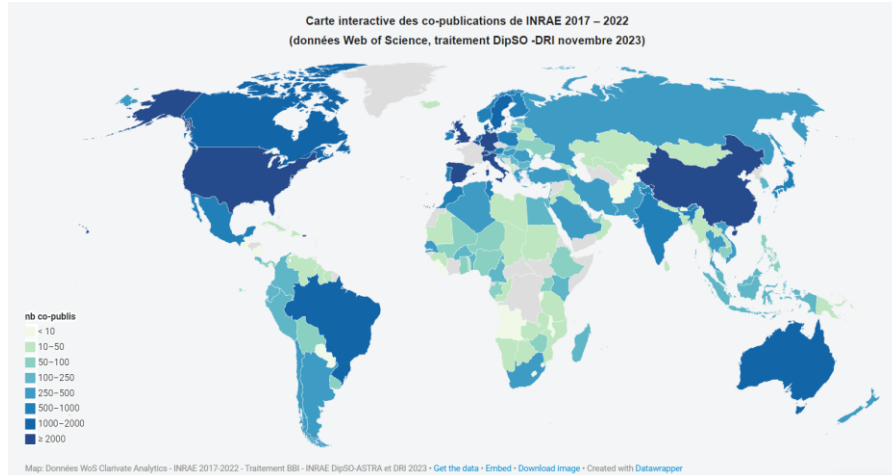
- Ecology of Forests and Terrestrial Ecosystems
- Water Resources & Uses



- Mathematics, Computer Sciences & AI
- Sciences for Action & Sustainable Development
- Economic & Social Sciences

INRAE: International scientific cooperation

Co-publications INRAE units with others partners in more than 150 countries around the world



INRAE tools for international partnerships:

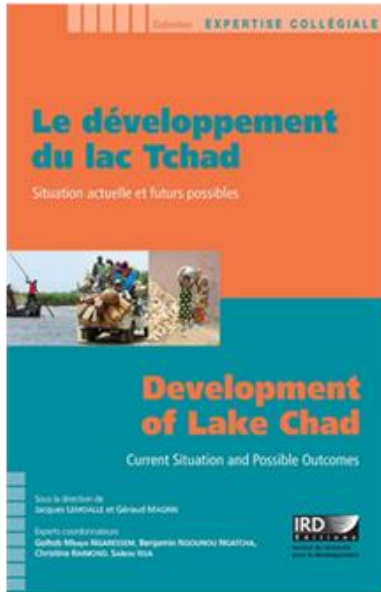
- International Associated Laboratories (LIAs)
- International Research Networks (2RI/IRN)
- Joint Linkage Calls (JLC)



+ Initiation & development of International Research Initiatives (IRIs)

Collective scientific assessment on

➤ Lake Chad development: current situation and possible futures (2014)



Will Lake Chad dry up? What would then be the consequences for its inhabitants, their environments?... Alarmist discourses and source of confusions...

Sponsor: **CBLT** (regional authority)

Scientific overview of the socio-environmental situation of the Lake, with key recommendations

Expert group : hydrologists, agronomists, geographers, historians, paleo-climatologists, sociologists ...

Some key impacts : on discours & public policy ; donors project programming, emerging multidisciplinary research communities ...

Collective scientific assessment on ➤ Small-Scale Fisheries in Haiti (2022)

Requested by the Ministry of Agriculture, Natural Resources and Rural Development (**MARNDR**) – with support of the Inter-American development Bank (**IDB**) in 2018.

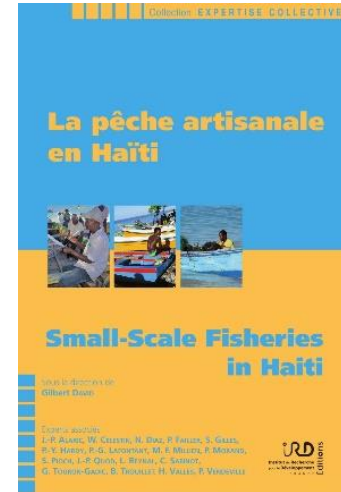
- multidisciplinary committee (Haitian and French Scientific): agronomists, fishery experts, marine biology, anthropologists, economists, educators, geographers and environmental managers...

Overview: 1. Environment, species and fishery; 2. Aquaculture, ecological intensification and management; 3. The fishery industry, from local level to the international context.

11 recommendations for sustainable fishery in Haiti (fisheries information system; promoting tan-based aquaculture in mangrove areas; pilot sites for artificial habitats, etc.)

Impacts...

- Support the design of the next **IDB/MARNDR Fishery programme** (phase 2): PARPAIR (14M USD)
- ... with hopefully operational project to follow (capacity building: aquaculture, FADs set-up and management, etc.)
- Capacity buildings (Masters and PhDs in marine ecology...)
- IRD/FAO co-publication “main Haitian Marine species: ecological & biological features, as well as interests for small-scale Fisheries” (FAO Fisheries and Aquaculture Circular - 2022)
- Scientific publication (Etudes caribéennes, etc...)



Collective scientific assessments on

➤ Climate change mitigation



CSA INRAE on soil carbon storage (2002)

—> Discussion of the place of carbon sequestration for the application of Kyoto protocol

Storing 4 per 1000 carbon in soils: the potential in France

On 19 June 2018, INRAE (formerly a study commissioned by the French Agency for Ecological Transition (ADEME) and the Ministry of Agriculture concerning the carbon storage potential of soils in France, using a novel methodology, the study was able to evaluate the potential by estimating the implementation cost, region by region, in terms of € tC/ha/yr. This 4 per 1000 initiative for food security and climate was launched during the UN Climate Change Conference held in Paris in 2015.



Advanced study INRAE on 4FOR1000 Carbon initiative (2020)

—> Robust methodology to assess spatially the quantity and the cost of carbon storage for several agricultural practices
—> Extension to the French case-study at EU level

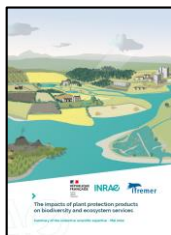
Collective scientific assessments on

➤ Pesticides

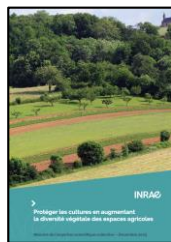


2005: Collective scientific assessment on Pesticides in agriculture

—> A reduction of the use of pesticides is necessary. idem for the split between sale/advice



2012: A national program Ecophyto to reduce 50% pesticides, if possible..., is conducted by the French government



2022: Three Collective scientific assessments on the impacts of pesticides on biodiversity (1, INRAE, Ifremer), on human health (2, INSERM), and on natural crop pests regulation (3, INRAE)

➤ Several discussions at EU level to prepare Sustainable Use Regulation (SUR) and Common Agricultural Policy (CAP), applied to the national scale

➤ Governance mechanisms

A multidisciplinary team

Committee of experts

- 10 to 30 researchers representing different scientific disciplines and institutions; geographical and gender balanced
- Recognized for their scientific production and expertise in the matter

Advisory committee

With the requested authorities (sponsors) and executive authorities

With key stakeholders and citizen organizations

- To regularly inform of the work progress, share observations and reinforce the appropriation of the issue and the results (recommendations)

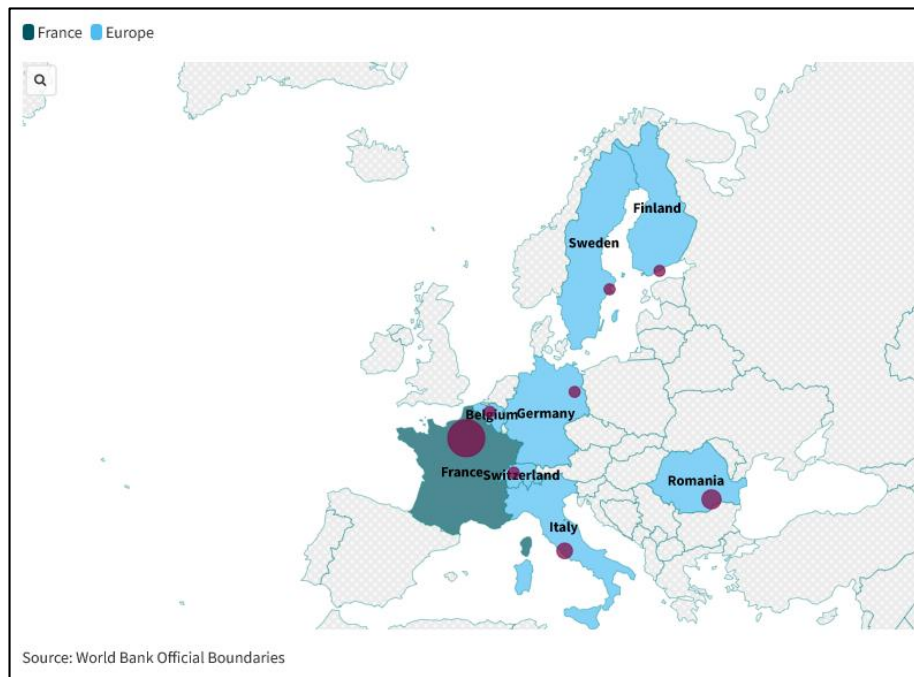
European chemical pesticide-free Agriculture (scientific committee example)



8 countries



21 experts



➤ Governance mechanisms (advisory committee examples)

CSA "Women in higher education and research" in Chad (2024):

- **Public authorities:** Ministry of higher education & scientific research (sponsor), Ministry of Women, Ministry of Education, Ministry of Health, Ministry of Training, EU Delegation, French Embassy
- **Stakeholders:** AFECST, CELIAF (NGO and network of NGOs)

CSA "Plastics for food and agriculture" (ongoing):

- **Public authorities:** Ministries of Agriculture and Environment, National agency for ecological transition
- **Stakeholders:** industrial organisations, civil society, competitiveness hub



➤ 3 standardised steps of the Collective Scientific Assessment (CSA)

(+/-) 18-24months



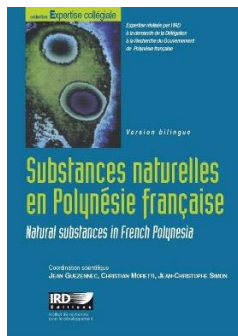
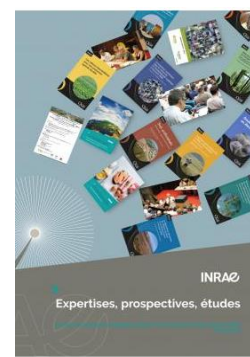
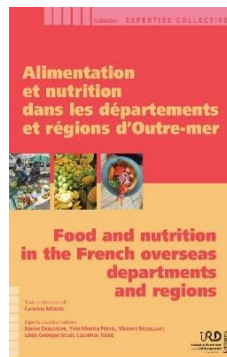
Co-processing work

1. **In-depth discussions** (key focus areas, questions, set-up of advisory committee, data exploration, scientific experts group...)
2. **Collective workshops** (collect, analyse, crosscutting reflection & work, drafting...lot of proofreading)
3. **Restitutions** (large public event, large dissemination and media coverage... increase results ownership and discuss the next step)

INRAE & IRD CSA Unit:

Organising and guarantying all stages of the process: general operation, recruitment of experts/researchers, interdisciplinary workshops, final report & dissemination ...

➤ Insights into IRD-INRAE collective scientific assessment



<https://www.editions.ird.fr/collection/96/Expertise%20collective>
<https://depe.hub.inrae.fr/travaux>

➤ Collective scientific assessments listing



- Small-Scale Fishery in Haiti (2022)
- Plant-based substances in Côte d'Ivoire (2022)
- Food and nutrition in the French overseas départements and regions (2020)
- Deep sea mineral resources in French Polynesia (2016)
- Development of Lake Chad (2014)
- Energy in the development of New Caledonia (2010)
- Diseases vector control in France (2009)
- The Niger River's future (2007)
- Invasive Species in the New Caledonia Archipelago (2006)
- Trachoma control in sub-saharan Africa (2006)
- Organic agriculture in Martinique (2005)
- Scientific diasporas (2003)
- Etc.

<https://www.editions.ird.fr/collection/96/Expertise%20collective>



- Impacts of plant protection products on biodiversity and ecosystem services (2022)
- Using plant diversity to protect crops and regulate pests (2022)
- Quality of animal sourced food: production & processing (2020)
- Can we farm organically without the use of copper? (2018)
- Eutrophication: causes, mechanisms, consequences (2017)
- Artificialized land due to urbanization and land take (2017)
- Animal Consciousness (2017)
- Cumulative impact of water basins on the environment (2016)
- Impacts and services of European livestock production (2016)
- Use of fertilising waste materials in agriculture and forestry (2014)
- Reducing nitrogen flows from livestock production (2012)
- Herbicide-tolerant plant varieties (2011)
- Dietary Behaviour: determinants and practices (2010)
- Understanding and limiting pain in farm animals (2009)
- Etc.

<https://www.inrae.fr/collaborer/expertise-appui-aux-politiques-publiques/lexpertise-scientifique-collective-prospective-etudes>

➤ To conclude

Collective scientific assessment:

- Allows to synthesize scientific knowledge on critical society issues, in response to a question asked by public authorities
- is collaborative, transparent and independent
- Adopts a multidisciplinary and systemic approach: address all dimensions of the impacts of the question and highlight trade-offs
- Recruits the best experts in scientific committees, not only INRAE-IRD experts!
- Also linking with society with a stakeholders' committee established for every CSA
- Enables collaborations with national/international partners

A useful tool and complementary approach:

- To support public policies for sustainable development
- To anticipate large investment programs

Thank you!

To go further :

IRD – Mission expertise: <https://www.ird.fr/expertise>

INRAE-EAPP et DEPE <https://www.inrae.fr/en/collaborate/expertise-and-support-public-policies>

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