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**INRAE**

Collection of international expertise projects at  
**INRAE**

  
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## Collection of international expertise projects at INRAE

This document, entitled “Collection of international expertise projects”, complements a first volume published in 2021 on the same type of activity<sup>1</sup>. Since the creation of the Deputy Directorate-General of Expertise and Support for Public Policies (DGDEAPP) in 2020, internal discussions have emphasised the importance of improving knowledge, understanding and “showcasing” what these activities cover and the products that characterise them. The International Expertise Project (EPI) has been defined in a framework note drawn up by a group of experts<sup>2</sup>. This note is presently available on the DAPP intranet.

Beyond this institutional framework, it seems important and timely to share concrete experiences- in the field- as well as the diversity of projects carried out by researchers on this activity. The aim of this collection is to illustrate this wide range of situations and experiences.

This document thus brings together some forty projects carried out in over 30 countries around the world. This collection reveals a large number of international organisations that commission (fund) expertises, including the AFD, FAO, IFAD, the World Bank, the European Union (EEA, JRC), several UN agencies (WHO, UNDP, WMO, UNEP, GEF) and the OECD, as well as private firms that call on the scientific expertise of the institution's researchers. There is also a wide range of thematic areas that it is impossible to describe here without omitting some, but which includes food safety, institutional innovations for sustainable agriculture, early warning systems for flood prevention (CREWS), wastewater reclamation (REUSE), the economics of deforestation, methods for limiting the impact of livestock farming (MRV), agricultural robotics as well as methods and tools for reconsidering inequalities, poverty and family structures.

Today, INRAE is a world-renowned player when it comes to carrying out large-scale, high-level research projects, and the growing importance of international expertise projects represents a new way of leveraging its know-how by boosting its visibility and reputation.

We wish you a pleasant read.

### José Martinez

Research Director  
Responsible for international expertise development at the DAPP

1. [https://www.inrae.fr/sites/default/files/pdf/Brochure%20expertise%20projet%20internationale\\_UK\\_PDF\\_WEB2.pdf](https://www.inrae.fr/sites/default/files/pdf/Brochure%20expertise%20projet%20internationale_UK_PDF_WEB2.pdf)

2. <https://dapp.intranet.inrae.fr/europe-international/expertise-projet-internationale>

# Table of contents

<b>Food - sustainable health</b> .....	<b>6</b>
eCooker: The promise of eCooking [electric cooking and sustainable development] .....	6
<i>Sébastien Desbureaux and Raphaël Soubeyran</i>	
Participation at Scientific Advisory Board .....	7
<i>Joël Doré</i>	
RAND Europe: contribution to the implementation of the survey entitled “C. difficile patient journey” .....	7
<i>Joël Doré</i>	
TimeSens® – TDS: Design, analysis and reporting of Temporal Dominance of Sensations studies .....	7
<i>Pascal Schlich</i>	
Evaluation of a gene therapy for the treatment of DMD (Duchenne Muscular Dystrophy) .....	8
<i>Thibaut Larcher</i>	
TDS: Total Diet Study in Sub-Saharan Africa .....	8
<i>Bruno Le Bizec</i>	
BBB: Using Green & Digital Technologies to reduce Food Waste at consumer level.....	9
<i>Barbara Redlingshöfer</i>	
<b>Agriculture - agricultural sciences</b> .....	<b>10</b>
IIABA: Institutional Innovations for Organic Agriculture in Africa .....	10
<i>Allison Loconto</i>	
Manuals and training: Promoting sustainable food systems “Enabling sustainable food systems- Innovators’ handbook”. .....	11
<i>Allison Loconto</i>	
IIAD: policy notes on institutional innovations for sustainable agriculture .....	12
<i>Allison Loconto</i>	
OECD: Agricultural robotics -A standards and procedures study .....	12
<i>Philippe Héritier</i>	
COSTEA 2: Second phase of the Scientific and Technical Committee for Agricultural Water .....	13
<i>Sami Bouarfa</i>	
IFM-CAP: Modelling water-related issues in the Individual Farm Model for the common agricultural policy model.....	14
<i>Pierre-Alain Jayet</i>	
<b>Water: structures, resource management, risks</b> .....	<b>15</b>
Mekong HYCOS-Project Phase 3: Concept for Core River Monitoring Network.....	15
<i>Étienne Leblois et Éric Sauquet</i>	
“Habitat dynamics in hydropeaking rivers”: data analysis services.....	16
<i>Nicolas Lamouroux</i>	
Upper Rhine: safety level of dikes .....	16
<i>Michel Lang</i>	
OKACOM: Sediment Assessment Study for the CORB.....	17
<i>Benoît Camenen</i>	
SAFE-M: Supporting learning and training in Madagascar .....	18
<i>Jean-François Humbert</i>	
SWOT: Surface Water & Ocean Topography – Working group on spatial hydrology .....	19
<i>Pierre-Olivier Malaterre</i>	
PATDHS: Hydropower Development on the Sanaga River - Technical Assistance Project .....	20
<i>Laurent Peyras et Rémy Tourment</i>	
CREWS - West Africa: Assessment- of flood early warning systems. ....	21
<i>Maria Helena Ramos</i>	

<b>Biodiversity, soil bioengineering, soils .....</b>	<b>22</b>
CoForMo Project: feasibility study for the use of a mobile data collection and centralisation tool .....	22
<i>Julien Ancelin</i>	
Support to the development of the European Soil Condition Assessment - Soil erosion .....	23
<i>Frédéric Darboux</i>	
GoLFor-DEEPN: Local Governance for Forest Resources Development, Environment & Political Economy in Nepal.....	23
<i>François Libois</i>	
P3A: Support-Program-to the Implementation of the Association Agreement .....	24
<i>Christian Dupraz</i>	
World Bank-study on the-MRV (Monitoring-Reporting-Verification) - method for livestock farming .....	25
<i>Jean-François Soussana et Vincent Blanfort</i>	
<b>Water: sanitation (REUSE/REUT) .....</b>	<b>26</b>
COSTEA- REUT: Reuse of treated wastewater .....	26
<i>Nassim Aït Mouheb</i>	
Training: Providing training on the various treatment processes suitable for small communities in rural areas.....	27
<i>Rémi Lombard-Latune</i>	
Massire: Strengthening agricultural and rural innovation systems in oasis and arid zones .....	27
<i>Nassim Aït Mouheb et Sami Bouarfa</i>	
WWTP --wastewater treatment /renovation of networks using constructed wetlands Hải Dương province in Vietnam and Mitsamiouli hospital in Comoros .....	28
<i>Rémi Lombard-Latune</i>	
REUT: methodology-for reusing treated wastewater .....	29
<i>Rémi Lombard-Latune</i>	
<b>Socio-economics .....</b>	<b>30</b>
ISIPII: Geographical Indications (GIs)- Expert contribution to the construction of a postgraduate module for the University of Padiadاران (UNPAD) in Bandung .....	30
<i>Stéphane Fournier</i>	
The economics of reforestation in South Asia.....	31
<i>François Libois</i>	
EPSF: Poverty and Family Structure Survey .....	32
<i>Sylvie Lambert</i>	
SFSC: Supply Chains: research brief.....	33
<i>Yuna Chiffolleau</i>	
<b>Thematic index .....</b>	<b>34</b>
Geographical index and index of experts/units.....	34
Index of INRAe units.....	35
Index of partners, funding and associate organisations in France and abroad.....	36
<b>Other abbreviations and acronyms .....</b>	<b>39</b>

# Sustainable food and health

## IN THIS CHAPTER

- PAGE 6** eCooker: The promise of eCooking [electric cooking and sustainable development]
- PAGE 7** Participation in the Scientific Advisory Board
- PAGE 7** RAND Europe: contribution to the implementation of the survey entitled “C. difficile patient journey”
- PAGE 7** TDS: Design, analysis and reporting of Temporal Dominance of Sensations studies
- PAGE 8** Evaluation of a gene therapy for the treatment of DMD (Duchenne Muscular Dystrophy)
- PAGE 8** TDS: Total Diet Study in sub-Saharan Africa
- PAGE 9** BBB: Using Green & Digital Technologies to reduce Food Waste at consumer level

## > eCooker: The promise of eCooking [electric cooking and sustainable development] Improving livelihoods, decreasing deforestation and promoting peace

Sébastien Desbureaux et  
Raphaël Soubeyran  
CEE-M unit, Montpellier

 **DRC**  
Democratic Republic of Congo  
2022-2025

### Ref.

Antwerp university improving livelihoods, decreasing deforestation, and promoting peace: experimental evidence from Eastern DR Congo; *Among the many links, the 'Research progress' section includes a link to the preliminary study in Dropbox.*  
eCooker Pre-analysis plan - AEA 20221003

Charcoal consumption and its impact on deforestation is a major development issue in sub-Saharan Africa. In Goma, in the east of the DRC (population 1.5 million), 92% of households rely mainly on charcoal for cooking. Legal tree plantations are not sufficient to meet the demand for cooking energy and, as a result, most of the demand is met by charcoal illegally produced in the protected forests of the Virunga National Park (ViNP)

The “Electric cooking and sustainable development” project supports the use of electric cooking as an alternative to charcoal. In partnership with energy supplier Virunga Energies, a ViNP company, a new generation of energy-efficient electric pressure cookers (EPCs or eCookers) will be distributed in the Goma region to test their potential. Advances in automation, insulation and pressurisation have considerably increased the efficiency of these EPCs, improving their price-competitiveness compared to charcoal. However, eCookers are still not widely available, partly because manufacturers are unaware of the demand outside other large, dynamic cities in the rest of the continent, such as Nairobi and Kigali. The project will also evaluate *in itinere* an experimental dissemination programme using the most advanced econometric analysis techniques.

The 2021 pilot study involving 1,500 households using the EPC confirmed the drastic reduction in charcoal consumption in favour of electricity. In mid-2022, a batch of eCookers/EPCs with demonstration sessions and cookbooks was distributed with the Tanzanian partner SESCO.

Trained ambassadors were able to collect a range of information from beneficiaries, particularly on usage and satisfaction. Pre-analysed in October, the data showed that the eCookers/EPC were being used for at least half of their hot meals, practically without difficulty.

Virunga Energies' ongoing monitoring of electricity consumption has also made it possible to analyse the impact of EPC distribution. After 4 months, an initial check showed an increase of 24kWh (USD 6) in households. Cooking a meal with EPC requires around 0.75kWh, which covers 32 hot meals a month - well over half the meals cooked each month in a household.

In addition, the reduction in demand for coal has had an impact on the illegal income of smugglers, improving conservation efforts in one of the world's largest tropical forests. In summary, the expected benefits are:

- Progressive replacement of charcoal cooking by electricity
- Reduction in energy costs and subsequent increase in the use of electricity
- Gradual elimination of illegal charcoal consumption
- Weakening of a key source of income for armed groups, improving security in the area.
- Increased income and improved health conditions for local people
- Empowerment of women
- Reduced deforestation, lower CO<sub>2</sub> emissions, wildlife protection

The final survey, expected in March 2023, will be followed by a second batch of 500 cookers in April 2023.

Post-intervention data collection is underway; there will be another phase of experimentation and data collection during the year.

**Funding:** for the fieldwork, funding came from the AFD via the FID, the FCDO and the CEPR's PEDL entrepreneurship component in low-income countries, as well as from CeMEB LabEx, I-Site MUSE (Univ. Montpellier). Funding for staff came mainly from FWO grants.

 **AFD - VIRUNGA Foundation - University of Antwerp**



© Raphaël Soubeyran

## Participation in the Scientific Advisory Board

Joël Doré  
MGPS -MICALIS unit,  
Jouy-en-Josas

 Various  
2021-2026

A multidisciplinary field in which Europe excels, synthetic biology uses engineering techniques to modify and improve biological components such as living cells. Based in Luxembourg, eureKARE was launched in 2021 in the biotech sector, following the peak of the health crisis.

This investment company aims to fill the gap in financing and support for the development and commercialisation of innovations in this sector. The *EureKabiome* start-up studio is one of these biotech companies.

The evaluation of synthetic biology and microbiome projects falls entirely within the remit of eureKARE's Scientific Advisory Board (SAB).

### Ref.

About the start-up EureKare:  
•EureKabiome: 'NovoBiome announces investment from eureKARE SA' (May 2021)  
•Presentation of eureKARE and its management teams.

Joël Doré is a member of this scientific committee, along with other eureKARE joint ventures (like MaaT Pharma and GMT Science).

 eureKARE

## RAND Europe: contribution to the implementation of the survey entitled "C. difficile patient journey"

Joël Doré  
MGPS -MICALIS unit,  
Jouy-en-Josas

 Various  
2021-2022

Founded in Sweden, Ferring is today a Swiss biopharmaceutical group specialising in reproductive medicine, maternal health, endocrinology, orthopaedics, urology and gastroenterology (including microbiome).

In this last area, Ferring Pharmaceuticals commissioned the RAND Europe Institute to carry out a survey entitled "C. difficile patient journey", focusing on *Clostridioides difficile* infections (CDI)\*.

Experts from 5 countries were asked to set up the survey among hospital practitioners. Joël Doré was chosen for France, as he is a member of a committee of experts tasked with identifying the difficulties of the patient journey and the clinical referral pathway for these infections (CDI).

The experts were also responsible for advising and supporting the healthcare community in online surveys and communication with the appropriate professional networks and then refining and reaching consensus following the online surveys for example through a series of teleconferences and workshops.

\*recently renamed "*Clostridioides colitis*"

### Ref.

- Popular science video: « C. difficile Infection Patient Journey » | Gastrointestinal Society (<https://badgut.org>)
- Ferring webpage dedicated to gastroenterology *Clostridioides difficile* infection
- Sept 2020 articles on the efficacy of RBX2660® in the treatment of CDI: Business Wire
- Web article from the RAND Europe Institute: "Addressing challenges in care for patients with *Clostridioides difficile* infection"
- Publication: "Improving Care for Patients with *Clostridioides Difficile Infection*", *Frontiers in Medicine, Infectious Diseases: Pathogenesis and Therapy*", Volume 9 (2023); doi: 10.3389/fmed.2022.1033417, posted on RAND.org on January 19, 2023

 Ferring International Center

## TimeSens® TDS: Design, analysis and reporting of Temporal Dominance of Sensations studies

Pascal Schlich  
ChemoSens -CSGA unit, Dijon

 Various  
2021-2022

The CSGA's ChemoSens platform developed TimeSens® software for collecting and analysing sensory evaluation data. This product had been marketed for 4 years by the start-up TSI (Temporal Sensory Innovation), but the obsolescence of the Microsoft Silverlight component caused this commercialization to cease. A lighter version of the software was then developed.

Since Barry Callebaut needed to continue collecting and analysing data on Temporal Dominance of Sensations (TDS), an annual service contract was proposed between Barry Callebaut and INRAE. In accordance with pre-established standards, the contract involves testing the group's products and providing the results in the various formats required.

### Ref.

- *In vitro* or *in vivo* studies of live and continuous flavour release.
  - High resolution studies of interactions between flavour molecules and proteins in the oral sphere. <https://www.gazettelabo.fr/blog/26chemosens.htm>
  - Gas chromatography coupled with olfactometry.
- 2018: Barry Callebaut introduces sensory language.

 Barry Callebaut Belgium NV

## ➤ Evaluation of a gene therapy for the treatment of DMD (Duchenne Muscular Dystrophy)

### Preclinical evaluation of an AAV9 encoding a mini-dystrophin in a rat model of DMD

Thibaut Larcher

PanTher unit, APEX platform, Nantes



Various  
2018-2025

A rare and disabling genetic disease, Duchenne muscular dystrophy (DMD) affects young boys and results from the absence of a protein, dystrophin, around muscle fibres. It causes progressive, generalised muscle weakness, leading to major motor difficulties and a significant reduction in life expectancy as a result of damage to the cardio-respiratory muscles.

For DMD, Pfizer laboratories, which have been developing gene therapies for several years now and in particular for rare diseases, have worked with private and public partners to develop a “gene medicine”, AAV9.CK.mini-dystrophin.

The efficacy of its administration was first tested in a rat model affected by the same mutation, in which long-term expression of a short version of the deficient protein in the muscles was demonstrated, along with stabilisation of the disease. These preclinical results obtained in animals have made it possible to launch a series of clinical trials in patients aged between 6 and 12, which have already shown promising results. A phase 3 trial\* called ClFFREO will include a cohort of around 100 volunteer patients.

\* Inserm: Clinical trials (Interventional studies on a health product)

#### Ref.

- DOI:10.1016/j.omtm.2023.05.017  
Evaluation of an AAV9-mini-dystrophin gene therapy candidate in a rat model of Duchenne Muscular Dystrophy (DMD) <https://pubmed.ncbi.nlm.nih.gov/37746247/>  
co-publication to be published in vol. 30, September 2023, pages 30-47 of the North American journal Molecular Therapy-Methods & Clinical Development:
- Inserm: Clinical trials (Interventional studies on a health product) <https://www.inserm.fr/en/our-research/clinical/clinical-trials-interventional-studies-on-a-health-product/>
- 2020 Pfizer Press Release: Pfizer's new Phase 1b results of gene therapy in ambulatory boys with Duchenne Muscular Dystrophy (DMD): Support Advancement into Pivotal Phase 3 Study

An expert in anatomical pathology and veterinary histopathology, Thibaut Larcher from the PanTher unit in Nantes, contributed to the evaluation of this innovative drug on sick rats.



## ➤ TDS

### Total Diet Study in sub-Saharan Africa

Bruno Le Bizec

LABERCA, Pays-de-la-Loire



Benin, Cameroon, Mali, Nigeria  
2015-2020

In 2018, the study involving Bruno Le Bizec, Head of LABERCA unit, focused on exposure to polycyclic aromatic hydrocarbons (PAHs) in four countries: Benin, Cameroon, Mali and Nigeria. The project included the supervision by LABERCA of the doctoral thesis by Luc Ingenbleek from the Centre Pasteur in Cameroon (CPC). The findings were intended to provide risk managers with a better understanding of the safety of food produced in the countries involved, and to identify management options to reduce the exposure of populations to certain chemical hazards. FAO and WHO contributed to raising US\$1 million to finance this project. The project was co-ordinated by Dr Jean-Charles Leblanc; data production & co-ordination of the laboratories were carried out by Prof Bruno Le Bizec, whilst the technical management of the project was entrusted to Dr Luc Ingenbleek. It was decided that the data should feed into a study with a broad spectrum of chemical hazards to assess the risk associated with persistent organic pollutants (POPs) in the context of a typical diet in sub-Saharan Africa.

Exposure to POPs requires Total Diet Studies (TDS), which are used to determine both the occurrence of these chemical hazards in foodstuffs and the dietary habits of the populations studied, in the four countries selected.

Contamination levels of six classes of POPs (dioxin, PCBs, organochlorine pesticides, brominated and chlorinated flame retardants, perfluoroalkyl substances) were determined in foods as prepared and consumed in these countries.

Given its scale, the project was also supported by the STDF (STDF/PG/303). Various national co-ordinating institutions in African partner countries were involved. In Cameroon, the Centre Pasteur (CPC), in Benin, the ABSSA (in particular the DLCSSA), in Mali, the ANSSA and the LTA of the West African think tank (Wathi) and finally, in Nigeria, the national drug agency, NAFDAC.

The contamination levels measured showed that higher concentrations were found in the most lipophilic samples (such as fish), but also that combustion of the smoking material could be a likely source of high contamination, particularly of PAHs.

Besides to its research activities through its Joint Research Unit, LABERCA is a National Reference Laboratory (LNR) for its activities in support of the French Directorate General for Food (MASA).



FAO, WHO;  
STDF, INOVALYS, CPC,  
ABSSA, ANSSA, NAFDAC

#### Ref.

- The STDF (Standards & Trade Development Facility) programme and the poster Total Diet Study, 2014.
- The TDS study, complemented by the STDF/PG/303 study - *Total Diet Study for Sub-Saharan Africa*;
- Article FAO 06/09/2019: “Large scale FAO Total Diet Study successfully assesses chemical residue contamination in food in Benin, Cameroon, Mali and Nigeria”
- Video about the programme on YouTube: “How safe is Africa's Food?”
- Publications récentes (2019-2020) auxquelles Bruno LE BIZEC a contribué :
  - Levels of persistent organic pollutants (POPs) in foods from the first regional Sub-Saharan Africa Total Diet Study. Environ Int. 2020 Feb;135:105413. doi: 10.1016/j.envint.2019.105413. Epub 2019 Dec 24. PMID: 31881431. Free article.
  - Sub-Saharan Africa total diet study in Benin, Cameroon, Mali and Nigeria: Pesticides occurrence in foods. eCollection 2019 Jun 30. PMID: 31432018. Free PMC article.
  - Regional Sub-Saharan Africa Total Diet Study in Benin, Cameroon, Mali and Nigeria Reveals the Presence of 164 Mycotoxins and Other Secondary Metabolites in Foods. 2019 Jan 17;11(1):54. doi: 10.3390/toxins11010054. PMID: 30658506. Free PMC article.
  - Human dietary exposure to chemicals in sub-Saharan Africa: safety assessment through a total diet study. 2020 Jul;4(7):e292-e300. doi: 10.1016/S2542-5196(20)30104-2. PMID: 32681900





## BBB: Using Green & Digital Technologies to reduce Food Waste at consumer level

**Barbara Redlingshöfer**  
SADAPT unit, Campus Agro  
Paris-Saclay



Various  
2021

Referring to the United Nations Environment Programme's 'Build Back Better' initiative, this project aims to help countries harness green and digital technologies to reduce food waste at the consumer level and recover from the shock of the COVID-19 pandemic, while also supporting the achievement of the SDGs and climate targets.

Reducing food waste is one of the main ways of improving food security, reducing both pollution and pressure on nature and climate. This strategy is also likely to create opportunities for the economy and society as a whole.

Yet, in 2019, it was estimated that 931 million tonnes of food were wasted by households, retailers, restaurants and other catering services, with 61% of this waste essentially coming from households.

Conducted by researchers from the Technical University of Denmark (DTU) and INRAE, at the request of UNEP, this project addresses several points. Through a review of the literature on the determinants of consumer waste, leads for reduction emerge: changes in behaviour, technological solutions and both, public and private initiatives. The researchers identify the opportunities and limitations offered by green and digital technologies to better guide behaviour towards reducing food waste. These insights are complemented by a comparative analysis of strategies for implementing such technologies in different contexts in five cities, namely Bangkok, Belgrade, Bogota, Doha and Kampala.

The report shows that consumer food waste is determined by various factors at several levels: individual, household and society. Interventions to reduce food waste must consider these factors and the everyday food practices in which they are embedded.

Green and digital technologies are increasingly being used to prevent, reuse and recycle food waste, opening up new opportunities. These technologies need a favourable environment to develop and to allow their potential to be exploited. As revealed by the case studies, most green technology solutions face difficulties in scaling up beyond the "niche market". Integrated into a holistic approach linking technology, policy and infrastructure, these technologies can act as a powerful catalyst and accelerator to support initiatives led by different actors and partnerships and help countries and cities to tackle food waste and "build back better" a more sustainable economy.

The research team was led by:

- 1) for the UNEP-DTU Partnership: Simon Bolwig assisted by both Anne Nygaard Tanner and Paul Riemann from the Department of Technology, Management & Economics at the Technical University of Denmark (DTU);
- 2) for INRAE: Barbara Redlingshöfer. All were co-authors, together with Ying Zhang of the Environment & Trade Hub team, based in Kenya, in UNEP's Economic and Trade Policy Unit. She contributed to the overall structure and messages, and led the drafting of the executive summary and concluding chapter.

### Ref.

Reports:

*Reducing consumer food waste using Green & Digital Technologies to Reduce Food Waste at Consumer Level*, ISBN No: 978-87-93458-06-2

UNEP-DTU Partnership and United Nations Environment Programme  
*Reducing Consumer Food Waste Using Green & Digital Technologies*. Copenhagen and Nairobi. 96 p. (2021)

Report also on INRAE's website, November 2021: *Reducing consumer food waste using green and digital technologies*

And also the following documents available for download:

- Fact sheet
- Technology flyer
- Full report



UNO; UNEP - DTU



## Agriculture - Agronomic sciences

### IN THIS CHAPTER

- PAGE 10** IIABA: Institutional Innovations for Organic Agriculture in Africa
- PAGE 11** Manuals and training: Promoting sustainable food systems
- PAGE 12** IIAD: policy notes on institutional innovations for sustainable agriculture
- PAGE 12** OECD: Agricultural robotics– A standards and procedures study
- PAGE 13** COSTEA 2: Second phase of the Scientific and Technical Committee for Agricultural Water
- PAGE 14** IFM-CAP: Modelling water-related issues in the Individual Farm Model for the common agricultural policy model: *a feasibility study*

## IIABA: Institutional Innovations for Organic Agriculture in Africa

### Participatory Impact Assessment (cf. AFD FISONG project “Rural development 2019”)

Allison Loconto  
LISIS unit,  
Champs-sur-Marne



Morocco, Uganda, Tanzania  
2019-2023

#### Ref.

- Summary (English and French versions): IIABA– Institutional Innovations for Ecologic and Organic Agriculture in Africa
  - Presentation of the IIABA project on:
    - LISIS unit website (INRAE)
    - MOISA unit website (CIRAD)
- [http://umr-lisis.fr/wp-content/uploads/2021/05/IIABA\\_Resume\\_EN-FR.pdf](http://umr-lisis.fr/wp-content/uploads/2021/05/IIABA_Resume_EN-FR.pdf)

Organic and agroecological production is being increasingly recognised for its role in solving the food security and nutritional problems of a rapidly growing population, and is also seen as an essential part of strategies for mitigating and adapting to climate change as well as conserving biodiversity.

This is particularly the case in Africa, where the development of organic farming is hampered by a number of obstacles, and must respond to a recognised public health issue. While awareness is growing at political level, particularly within the African Union, players in the sector have felt the need to create synergies across the continent to help organic farming play a proper role in African development by expanding AfrONet, the African organic farming network based in Tanzania.

A transition to organic farming requires simultaneous action throughout the food system. If it is to reach continental scale in terms of geographical presence and organisational capacity, as well as in terms of distributed and autonomous activities, the players in the food system today need to commit not only to technological innovations in production and processing, but also to the construction of fair and inclusive markets.

Hence the development of the IIABA project (Institutional Innovations for Organic Agriculture in Africa), which consists of various actions to put in place, beyond production and processing, institutional innovations for the organic farming sector, regarding markets, guarantee systems and public policies. These three main components of the project are accompanied by two complementary ones: “Management and coordination” and “Communication, dissemination and capacity building”.

To coordinate this IIABA project with the FISONG mechanism (financing international solidarity projects), AFD has launched a highly competitive call for tenders FISONG-2019 with a budget of €1.45 million for “Partnerships for the production, marketing and certification of organic or agro-ecological products in response to local socio-economic and environmental issues”. This project also mobilises the SAVi methodology created in 2017 by the IISD, the FAO and the One Planet Network (cf. OCDE Tools for addressing SDGs). For INRAE, which won the tender with the proposal from UMR LISIS, jointly with CIRAD, this project should contribute to the objectives of the GloFoodS and Metabio metaprogrammes (new meta-programme on “Scaling up AGRIBIO”).

Initially, IIABA plans to support three pilot countries: Morocco, Tanzania and Uganda, where it will run until the end of 2023. In these countries, the agro-biological movements are members of AfrO- Net, but the situations differ in terms of agro-ecological zones, converted farmland and the number of organic farmers. IIABA aims to catalyse a change of scale in organic farming, to facilitate its development and consider the extension of various innovations to members on the African continent.

The project has three specific objectives:

1. To identify institutional innovations that will allow a change of scale of ecological and organic agriculture in the targeted countries;
2. To consolidate the capacities of AfrONet and its members;
3. dissemination of targeted institutional innovations in partner countries and within AfrONet.

And three main axes:

1. building innovative markets,
2. creating credibility/quality systems (participatory certification),
3. implementation of public policies.

The aim is also to accompany stakeholders in their appropriation of these innovations, whose open typology includes food security strategies (and no longer just economic ones, e.g. exports), as well as the challenges of climate change.

Implementation of the IIABA project was supposed to be carried out by the usual NGOs, but the INRAE-Cirad alliance disrupted this by bringing together researchers and local NGOs in each of the three pilot countries: TOAM (Kilimohai) in Tanzania, NOGAMU in Uganda, and FIMABio and RIAM in Morocco.

The research-action part on agro-ecological transition issues in Uganda, will be supervised by Allison Loconto (LISIS-INRAE) and Ève Fouilleux (LISIS-CNRS/Cirad), with the involvement of Arlène Alpha and Sylvaine Lemeilleur from MoISA joint unit.

LISIS unit will also be responsible for an original approach to participatory impact assessment, with the involvement of a post-doc.

The expected results include the supply of guides and tools that should enable the three pilot countries, as well as AfrONet and its African partners, to persevere and strengthen the construction of ongoing initiatives.



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AFD  
AfrONet, AU; CIRAD;  
TOAM, NOGAMU, FIMABio, RIAM

## ➤ Manuals and training: Promoting sustainable food systems

### “Enabling sustainable food systems- Innovators’ handbook”

Allison Loconto  
LISIS unit, Champs-sur-Marne



India

2020-2021

In association with FAO, Allison Loconto provides training in new tools designed to implement sustainable local food systems in several African countries and in India.

The handbook is an effective means of bringing about change in the food systems of partner projects. In India, the training given by A. Loconto had been very well received, but in the meantime Covid\* confinements had wiped out the supply chains of many communities, despite some growth with new small local agricultural markets.

Interest was rekindled and amplified during A. Loconto's videoconference on 15/12/2020 with the town of Shimla (Himachal-Pradesh State) for the local launch of the ‘Enabling Sustainable Food Systems: Innovators’ Handbook’. The aim of this exchange was to promote better local cooperation towards natural agriculture. A. Loconto stressed that natural agriculture was beneficial not only to the environment but also to human health.

She was supported in this by Gábor Figeczky from IFOAM in Germany and by the local FAO representative, Tomio Schichri, for whom the handbook emphasises the preservation and conservation of local cultures, which he compares to those in Japan. Among the other organisations, presentations and participants, it is worth noting VAF (Tata Trusts), which had just published “Sustainable Agriculture in India: Why does it not Scale Up?” 6 months earlier.

The following day, a high-level meeting was held, at which Jai Ram Thakur, the Chief Minister of this State, pointed out the link with his own “Sustainable Food Systems Mechanism” programme, which he advocates as an alternative (see article and photos from local newspapers dated 16/12/2020 with the book in the original version and in English). He has advocated this mechanism, which guarantees the proper marketing and certification of natural agricultural products that are beneficial to human health and the environment, and which also enables small farmers to obtain better prices for their products.

#### Ref.

INRAE web dossier oct. 2020:  
FAO – INRAE and local innovators partner to build sustainable food systems.

Article from 5 Dariya News, Shimla, 15 Dec 2020  
High level meeting under Prakritik Kheti Khushal Kisan Yojna held

The INRAE programme has been adopted as a tool for structuring the Sustainable Food Systems Mechanism programme of the State of Himachal-Pradesh, which is seeking support for such a transition.

In 2022, an e-learning course based on this manual (with participants from the IIABA project) was developed and tested.

In 2023, 30 people will be trained in October and November.



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\* *Management of the Pandemic: Agriculture, Food Management & Resilience during Covid-19 in India*, Pushpa Singh, First Published October 26, 2021  
doi: 10.1177 %2F00195561211045094 (article first published online: October 26, 2021; Volume 67 issue 3, page(s): 324-336 Issue published: September 1, 2021)

## ➤ IIAD: policy notes on institutional innovations for sustainable agriculture

Allison Loconto  
LISIS unit, Champs-sur-Marne

 Various  
2020-2021

To meet the Sustainable Development Goals\*, the international community agrees on the need to move towards more sustainable food systems. Although many farmers have been trained in sustainable farming practices as part of FAO field projects, they are not always able to adhere to them because the institutional environment is not adapted to the need to support these new practices. It seems therefore necessary to work at different levels and to develop new forms of collaboration between producers practising sustainable agriculture, responsible consumers, researchers, local authorities and value chain intermediaries in order to bring about a change in the system.

In 2013, the FAO initiated a study in collaboration with INRAE on the market incentives likely to encourage producers to adopt sustainable agriculture practices. The participatory research was completed in 2016 with the publication of “Innovative markets for sustainable agriculture” (or “How innovations in market institutions encourage sustainable agriculture” in developing countries).

Since 2016, FAO and INRAE have been continuing this work in a Community of Practice that was created thanks to this participatory research approach, with innovators in more than 20 countries

The aim of this collaboration is to develop a practical handbook for innovators to help them better navigate the necessary changes to local food systems. The overall objective of these policy briefs is to better disseminate lessons learned and success stories on innovations in the organisation of food systems that promote sustainable consumption and production practices. More specifically, the objective of this activity is to transform the research results of the 2016 book and the innovators' handbook into a series of short policy briefs with photos and layout for policy makers, FAO field office representatives, and potential partners.

\*in particular the SDGs 1, 2, 3, 11, 12, 13, 14 and 15

### Ref.

- INRAE web dossier Jan. 2023: Promoting a global dynamic of agricultural and food systems: examples <https://www.inrae.fr/en/reports/towards-healthy-and-sustainable-food/promoting-global-dynamic-agricultural-and-food-systems-examples>
  - Forum: Science, Technology and Innovation 2023
  - Citations: The FAO and four French research institutes strengthen their collaboration / New cooperation agreement between FAO and INRAE, CIRAD and IRD <https://www.cirad.fr/en/press-area/press-releases/2022/cooperation-agreement-fao-inrae-cirad-ird>
- FAO: <https://www.fao.org/family-farming/detail/en/c/1200068/>



## ➤ OECD: Agricultural Robotics

A standards and procedures study

Philippe Héritier  
ROMEa -TSCF unit,  
Montoldre (Clermont-Ferrand)

 Various  
2022



© INRAE

The OECD Tractor Codes were launched in 1959 with the aim of establishing common rules and having the same safety protocols and procedures. The OECD is currently studying the possibility of developing standards and test procedures to certify autonomous vehicles in agriculture. As technology develops at a rapid pace, more and more companies are developing these types of vehicles. The challenge is to guarantee their efficiency and safety.

However, there is a lack of clear and common rules to bring these vehicles to market safely. The OECD is working with its member countries and all stakeholders to develop a global set of rules and regulations to facilitate the marketing of this new type of agricultural equipment. This is how the project for a test protocol for self-propelled vehicles in agriculture came about.

The aim is to develop repeatable and reproducible indoor/outdoor laboratory tests and to explore the feasibility of developing a common test protocol focusing on: “Performance of systems involved in the safety of autonomous all-terrain agricultural vehicles”. In collaboration with INRAE, the OECD's aim is to propose basic rules and protocols that all member countries can follow in the future, thereby guaranteeing fair competition.

The work can also help to identify the problems hindering the development and use of these new technologies. The test protocol can build on work already developed by other institutes and/or organisations and can guide discussions between OECD member countries. This is a particularly topical issue, and one that is also at the heart of many of MASA's concerns, which has planned a specific survey in 2023, mainly to take stock of equipment.



### Ref.

- INRAE November 2022: *Agricultural robots: the safety challenge: INRAE and SABI AGRI create the LabCom TIARA* | INRAE (in French)
- Find out more by watching the 3-minute video: <https://www.inrae.fr/actualites/robots-agricoles-defi-securite>
- France 3 TV report on YouTube (in French): Robotics and Artificial Intelligence to develop weeding robots at Montoldre (Allier region) in Oct. 2019, Philippe Héritier and TSCF unit
- OECD: ✓subject Technology and digital in agriculture; ✓brochure Guidelines for Code-2 - 2019 (6th anniversary); and ✓Feb 2023: - OECD- tractor codes: general texts
- RÉUSSIR articles: ✓Machinery – A public enquiry into agricultural robots planned for 2023 (in French)
- ✓Vie publique Article: agriculture- *the key role of robotics*” (in French)

## ➤ COSTEA 2: second phase of the Scientific and Technical Committee for Agricultural Water

**Sami Bouarfa**  
GEAU, Montpellier



**Various**  
**2017-2022**

Rural areas in the South are facing ever-increasing pressure from climate change, political and health crises, and the continuing degradation of soil and water resources. Irrigated agriculture is therefore a crucial issue in terms of food security and socio-economic development. To meet the growing demand from southern countries for reinvestment in irrigation, the COSTEA programme was set up in 2013 with €1.2 million from AFD for an initial 5-year phase. AFEID is in charge of project management.

Coordinated by Sami Bouarfa, COSTEA is a multi-stakeholder platform for irrigated agriculture that helps to improve irrigation policies and projects in the countries where the AFD operates. The aim is to create sustainable irrigated systems that integrate the imperatives of productivity as well as all the dimensions of socio-economic and environmental sustainability. The project brings together an international community of experts in the sector (researchers, consultancy firms, institutional players and civil society) on a voluntary basis.

AFD's contracting authorities at local level are involved as much as possible, as are the players who interact with them: the administration, universities and research institutes, professional sectors, and organisations, NGOs and irrigator associations. For example, links were quickly established with the CILSS "Sahel Initiative" project (a Burkina Faso committee supported by the WB).

Phase 1 resulted in a collective work, published by Quæ. The second phase of COSTEA was more ambitious, with a €5m grant managed by Afeid.

COSTEA had been structured around 7 major projects with field activities, called Structuring Actions, and 5 expert groups, called Collaborative Actions. These 12 actions have covered a wide range of topics, described on the COSTEA website. Phase 2 of COSTEA was evaluated by an external firm (Baastel), which concluded that its strategies and procedures were efficient and relevant. The evaluation recommended further development of COSTEA. Phase 3 of COSTEA is currently being prepared for the period 2024-2027.



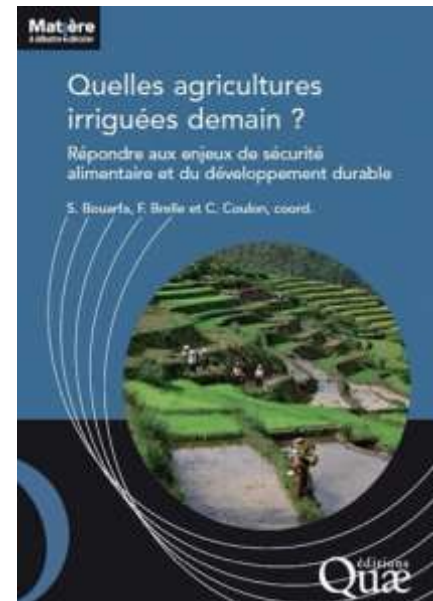
**AFD; AFEID; CILSS/WB - and communities**

### Ref.

- The Phase 1 collective work, published by Quæ: "Which types of agriculture will be irrigated tomorrow?"  
<https://www.comite-costea.fr/en/le-costea/notre-ouvrage-collectif/>
- COSTEA produces summary notes, seminar materials, study reports, scientific publications and videos: see <https://www.comite-costea.fr/>



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## IFM-CAP: Modelling water-related issues in the Individual Farm Model for the Common Agricultural Policy model

### A feasibility study

Pierre-Alain Jayet

PSAE unit, Versailles-Grignon



Europe

2018-2019

For the CAP, and in particular for the 2023-2027 CAP which incorporates the European Green Pact (EU climate neutrality by 2050), modelling is an essential and indispensable tool for assessing the economic impacts. This is the purpose of IFM-CAP, one of the models designed for this purpose. It can be used to assess a wide range of public policies impacting on the diversity of farms in the EU; it provides detailed analyses of different production systems and can estimate the distributional effects on the farming population.

Agricultural water management linking yields and irrigation choices at farm level is a real methodological challenge. Water resources are rarely included in models of this nature, hence the interest in explicitly including them in the IFM-CAP model.

This is the aim of the feasibility study commissioned in 2018 by the MIDAS group of the JRC-Seville dedicated to modelling for public decision-making. The prospective study was carried out in several phases: formulation for modelling; implementation; ex-post evaluation.

The aim is to examine the possibility of improving the IFM-CAP model with water as an input, by exploiting the method developed for the AROPAj\* model and presented in the article “Farm-Level Bio-Economic Modelling of Water and Nitrogen” (Humboldt, 2017). The approach mobilises a biophysical crop model (in this case INRAE's STICS model) in order to include water in IFM-CAP and estimate the yield response to water (and nitrogen) on the crop plot in a modelled individual farm.

The method thus offers a selection criterion that is sufficiently generic to be applied to a large number of crops on a large number of farms in the EU, provided that information on soil, climate and phenology is available, supplemented by observations on yield and input levels, as well as crop and input prices. The approach also offers an indirect means of deducing the predominant soil type for the crop in the region, enables the quantities of water and nitrogen used to be estimated, and provides an indication of the cost of access to water, assuming that the farmer is optimising the gross margin of their farm.

This should enable the IFM-CAP model to respond to the problems encountered in bio-economic modelling of farms, with the lack of information concerning the costs of access to and use of water.

Integrating water into IFM-CAP involves creating an independent calculation module that calibrates the yield response to irrigation water. This makes it possible to assess the response of farmers to different policy scenarios, in terms of the intensive effect (gross margin of the crop at plot level) and the extensive effect (gross margin of the farm's crops after optimal land reallocation for a given UAA). The results produced by this module shall be used as input data for the basic version of the IFM-CAP model. The module was tested in two FADN regions (NUTS-2), Midi-Pyrénées and Thessaly.

The report on the study carried out by INRAE presents the theoretical, mathematical and technical specifications, as well as the results of the case study. The method, which is feasible (and used by the AROPAj model), will have to be refined for its adaptation to the IFM-CAP model, in particular with regard to the integration of the nitrogen input into the model.

\*AROPAJ techno-economic model for static, single-period optimisation of European agricultural supply



#### Ref.

- Kremmydas, D., Petsakos, A., Ciaian, P., Baldoni, E. and Tillie, P., The EU-Wide Individual Farm Model for Common Agricultural Policy Analysis (IFM-CAP v.2), EUR 30949 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46336-8, doi:10.2760/248136, JRC127014:  
“The INRAE crop model STICS, a French acronym standing for multidisciplinary simulator for standard crops”.
- About FADN (Farm Accountancy Data Network, RICA in French):  
✓ <https://agriculture.gouv.fr/les-50-ans-du-reseau-dinformation-comptable-agricole-rica>  
✓ <https://agriculture.gouv.fr/le-reseau-dinformation-comptable-agricole-rica-analyse-ndeg-23>
- Article on the benchmark study, published in February 2017: revue Agricultural Systems, volume 151, pages 47-60: “Farm-level bio-economic modeling of water and nitrogen use: calibrating yield response functions with limited data”, DOI: 10.1016/j.agsy.2016.11.006



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## Water: hydraulic structures, resource management, risks

### IN THIS CHAPTER

- PAGE 15** Mekong HYCOS-Project Phase 3: Concept for Core River Monitoring Net
- PAGE 16** “Habitat dynamics in hydropeaking rivers”: data analysis services
- PAGE 16** Upper Rhine: safety level of dikes
- PAGE 17** OKACOM: Sediment Assessment Study for the CORB
- PAGE 18** SAFE-M: Supporting learning and training in Madagascar
- PAGE 19** SWOT: Surface Water & Ocean Topography
- PAGE 20** PATDHS: Hydropower Development on the Sanaga River Technical Assistance Project
- PAGE 21** CREWS - West Africa\*: Assessment of flood early warning systems

### ➤ Mekong HYCOS-Project Phase 3: Concept for Core River Monitoring Network

Étienne Leblois and Éric Sauquet  
HyBV -RiverLY unit, Lyon



Mekong river, lower basin  
2019-2023

#### Ref.

Site dedicated to monitoring the basin:  
Near Real-time Hydrometeorological Monitoring  
Handbook on the 1995 Mekong Agreement,  
a cooperation agreement for the sustainable  
development of the Mekong Basin.

The Mekong River Commission (MRC) is the cooperation body between the four countries of the lower river basin: Cambodia, Laos, Thailand and Vietnam. Since 2007, the MRC has notably led the Mekong- HYCOS (2007-2012) and Mekong-HYCOS Follow-up (2016-2017) projects as part of WHYCOS and IWRM.

These two projects have enabled the installation of more than 30 hydrological stations along the Mekong and its tributaries, making it possible to establish a data collection system shared between the MRC and its member states.

In 2017, wishing to extend this support for the Mekong hydrometric network, the MRC approached AFD, which requested that local skills in water resource analysis be strengthened. The MRC therefore launched an extra call for tenders for this purpose, which was jointly won by OIEau, INRAE, IWMI and CNR.

After this phase 2 for 2016-2017, AFD agreed to support phase 3 launched by the MRC for 2019-2023.

This phase 3 of Mekong-HYCOS is focused on the identification and implementation of the Mekong River monitoring network.

The overall objective of this project is to provide a sustainable, standardised, harmonised and integrated monitoring system to achieve four specific objectives:

1. assessment of river status and trends;
2. management of hydraulic infrastructure project operations;
3. flood and drought forecasting;
4. assessment of the socio-economic conditions of vulnerable people whose livelihoods depend on the river.

It is also organised into the following 5 components:

- ① examination, analysis and design of a central river monitoring network;
- ② extension of the Mekong-HYCOS network (new design and development of a central network);
- ③ improvement in the use of hydro-meteorological data and statistics (Phase 2 IT tools);
- ④ support for the operation and maintenance of existing stations; and
- ⑤ technical expertise to support the project.



MRC/AFD;  
CNR, OIEau, IWMI



## ➤ “Habitat dynamics in hydropeaking rivers”: data analysis services

**Nicolas Lamouroux**  
EcoFlowS, RiverLY unit, Lyon

 **Various**  
2021-2022

 **EAWAG, ETH**

### Ref.

- Collective publication: Bätz, N., Judes, C., & Weber, C. (2023). “Nervous habitat patches: The effect of hydropeaking on habitat dynamics. *River Research & Applications*”, 39(3), 349–363; <https://doi.org/10.1002/rra.4021>
- On the same subject, article by Christine Weber and Claudia Carle, November 2021: “Flood protection for aquatic organisms: Bedload plays an important role”.

The modification of river flow regimes caused by peak hydroelectric production (hydropeaking) results in rapid changes in aquatic habitats, both spatially and temporally, which need to be better characterised in order to quantify their effects on biodiversity.

Because of the need for renewable energy, the frequency of hydroelectric peaks is set to increase over the coming decades. The idea is to define appropriate indicators to describe the impacts of hydropeaking.

*Financial support by the Swiss Federal Office for the Environment (FOEN) for Nico Bätz and from Électricité de France (EDF) for Clarisse Judes. We thank Jan Baumgartner, Benjamin Berger and Steffen Schweizer (Kraftwerke Oberhasli AG) for providing data for the showcase.*

Open access funding provided by:  
ETH Bereich Forschungsanstalten



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## ➤ Upper Rhine: safety level of dikes

**Michel Lang**  
HyBV, RiverLY unit, Lyon

 **France, Germany,  
Switzerland, Netherlands**  
2018-2020

### Ref.

- Lang, M., Darienzo, M., Le Coz, J. & Renard, B. (2022): “Evaluation of the uncertainties and homogeneity of long series of flood flows on the Rhine at Basel (1225-2017) and at Maxau (1815-2018)” (in French). LHB, 108(1); <https://doi.org/10.1080/27678490.2022.2053313>

From 2018 to 2020, INRAE carried out a study on the characterisation of extreme flows on the Rhine on behalf of the DREAL Grand-Est (regional administration), with exchanges within the International Permanent Commission for the Development of the Upper Rhine in conjunction with the ICPR - International Commission for the Protection of the Rhine (in German, IKSR – i.e. Internationale Kommission zum Schutz des Rheins). This study originates from considerable differences in the estimation opinion on the value of reference flows associated with return periods. The millennial flood (resp. decamillennial flood) in the study by the Technical University of Karlsruhe (IWG) that was validated by the standing committee in May 2010 corresponds to a centennial (resp. millennial) flood in certain French studies.

Michel Lang has formulated an opinion on the estimation of reference floods in the downstream part of the Franco-German Rhine, based on the processing of two long hydrometric series at Basel (1808-2017) in Switzerland and at Maxau (1815-2018) in Germany. The differences stem from methodological choices. In the German study carried out in 2010 by the University of Karlsruhe, flow data from the 20<sup>th</sup> century was used as earlier data from the 19<sup>th</sup> century was considered too uncertain, given the developments that have taken place on the Rhine since then.

In the study carried out by EdF in 2002 on the Fessenheim and Kembs\* diversion dams (biefs), further upstream, the major floods on the Rhine during the 19<sup>th</sup> century were kept by using the Swiss hydrological yearbooks from 1808. On the other hand, the probability laws used by the Germans (log-normal law), and the French (Gumbel root law), have different asymptotic behaviours, which have an impact on the extrapolation of the flood distribution for high return periods.

The approach proposed during the expertise consisted of using a probabilistic model that considers the uncertainties surrounding flood discharges. This made it possible, on the one hand, to discriminate against old data, which have greater uncertainty than recent ones, and, on the other hand, to include in the analysis the major events from the 19<sup>th</sup> century that have not been observed since.

\* EDF’s hydroelectric power plants and dams along the Rhein river flow: <https://www.edf.fr/hydraulique-alsace-vosges/la-production-hydroelectrique-sur-le-rhin-franco-allemand>

 **DREAL Grand-Est, ICP**

Uncertainties in flood flows are of the order of  $\pm 5-7\%$  for the recent period, rising to  $\pm 45-48\%$  for the oldest flows. Analysis of the flood distribution led to the conclusion that the current safety level of the dikes downstream of Strasbourg is consistent with the legislation, with overflow only possible beyond a 10,000 years’ return period flood.

The results of the EDF study (2002) at Basel appear to be overestimated, with flood quantiles Q100 and Q1000 significantly higher than the empirical distribution 1808-2017, and a Q1000 value at Basel higher than that estimated at Maxau. This over-estimation is partly due to the decision not to consider the flood attenuation that took place after the Jura correction works in Switzerland, from 1890 onwards, and not to correct downwards the floods prior to 1890 in order to use an identical reference state.



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## ➤ OKACOM: Sediment Assessment Study for the CORB

**Benoît Camenen**  
HyR, RiverLY unit, Lyon

 **Botswana, Namibia, Angola**

2021-2022

OKACOM, a dedicated tripartite commission, had already initiated various national plans, supported by the GEF notably, on the human, economic, scientific and technical aspects of the CORB, the Cubango-Okavango River Basin. Among other things, these studies revealed critical gaps in the knowledge of the sedimentology of the CORB. As the basin spans three countries, namely Botswana, Namibia and Angola, it also requires specific skills in integrated water resource management (IWRM) (specifically requested by the ToR).

Taking up the baton, the OKACOM “Sediment Assessment study for the CORB” project aimed thus to set up a network of hydro-sediment measurements on the CORB. Coordinated by the University of Botswana (UB), the project was led by Professor Murray-Hudson, who teaches wetland ecology at the Okavango Research Institute (ORI). Universities in the two other neighbouring countries were also involved: UNAM in Namibia and UAN in Angola.

OKACOM's research focuses mainly on eco-hydrology to understand the dynamics of tropical wetlands driven by flooding. In addition to the potential effects of climate change, dams and water abstraction, this also includes the dynamics of nutrients in the context of potential pollution. It also looks at wetland biogeochemistry, sediment dynamics and tectonics as drivers of wetland landscapes and ecosystem services.

As part of the “Sediment Assessment study” project, the aim was to carry out an initial assessment of sand transport in the CORB in order to set up a hydro-sediment measurement network covering the entire basin in the medium term.

The international experts involved, who also acted as trainers, were:

- for INRAE, Benoît Camenen of the HyR team within the RiverLY unit, and,
- for the Geosciences Rennes laboratory, Alain Crave, head of the “River” team within the “Water, Resources and Fluid Interactions” Department.

**Ref.**

- WHC-UNESCO: “Overview of the Cubango Okavango River Basin in Angola: challenges” (June 2019)
- OKACOM expert map: Cubango-Okavango River Basin
- National Geographic Video: “Protecting the Okavango Basin” by Cory Richards
- UNESCO article: “Angola, Botswana and Namibia co-manage shared river system of the Okavango Delta”

The report currently being finalised will be accompanied by an EMF that will enable OKACOM to draw up a Strategic Action Programme.

 **Permanent OKACOM Water Commission**  
GEF (UNDP)



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## SAFE-M: Supporting learning and training on water in Madagascar

Jean-François Humbert  
DCFE, CoMIC at the IEES,  
Paris/Versailles-Grignon

 Madagascar  
2021-2023

### Ref.

The SAFE-M project – “Context and issues today” (in French), (ipgp.fr)

Madagascar has one of the highest poverty rates in the world and one of the lowest Human Development Indices (HDI, UNDP). Water is a major issue for the country's development, and manifests itself in a number of ways:

- scarcity;
- prospecting difficulties in the semi-arid south-west;
- impact of global change on agricultural water use in rural areas of the Central Highlands;
- water pollution and a lack of waste management making resources unfit for use in urban areas.

Since 2016, with the launch of the WaSaf programme coordinated by Jean-François Humbert, INRAE has been invested in this project, which aims to put in place lasting monitoring, management and protection of drinking water resources in Africa. For these actions to be long-lasting, it is essential to strengthen higher education to provide qualified and competent professionals in the field of water and to boost the sector.

This presupposes support for Madagascar's higher education and research institutions (under the administrative supervision of the Minister MESupReS) in order to enable them to maintain the necessary skills chain. In particular, this means supporting the development of skills in this field with professionalising training courses of international standard involving major themes such as geophysical prospecting, water chemistry and treatment, hydrology and hydrogeology, waste management as well as risk and crisis management.

There are many issues at stake:

- Developing and improving higher education (BDM) in the water sector,
- making the higher education sector more dynamic and autonomous by developing economic models that encourage self-financing,
- Improve access to water for the population by developing local expertise and technical facilities for water prospecting, distribution and protection,
- ensuring that people can use water safely,
- developing emergency responses to water-related crises, and also
- anticipating the effects of climate change in a country where the evolution of water resources is highly uncertain over the next few decades, in order to increase people's resilience, while accompanying the fight against food insecurity and improving hygiene and health conditions.

This is precisely the aim of the SAFE-M project launched in 2022 with the support of IdEx - Université de Paris 2019, as an extension of WaSaf.

The aim is to help the Madagascan researchers set up a professional training chain in the field of water-sanitation-hygiene that meets international standards. At the beginning of 2022, several organisations joined SAFE-M, including Ran'Eau, Transparency International (TI) and 4 Madagascan universities. As early as the summer of the same year, the Madagascan teams were able to start taking ownership of the project and preparing future actions.

The SAFE-M dataverse page gives access to various data and achievements on the different sites: teaching materials, scientific productions and data acquired as part of the project.

The life of the project: significant actions starting from 2022 include the installation of teaching equipment; lessons and practical work on the chemistry of water; *in situ*, geo-referencing of water points with training in taking field measurements, data collection and GPS positioning; receipt of the hydrology equipment that enabled the mission to Toliara; in December, NOÉ training: crisis management ...and the “life of the project” continues...

 FFEM/AFD




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## ➤ SWOT: Surface Water & Ocean Topography

### Working group on spatial hydrology

Pierre-Olivier Malaterre  
GHOSTE, G-EAU, Montpellier

 Congo  
2014-2023

The SWOT satellite was launched in December 2022 as part of a Franco-American CNES-NASA mission, with support from the UK and Canadian space agencies. The budget of close to USD 1 billion and an “*investments for the future programme*” (PIA) also includes the preparation of products to exploit the satellite data collected, on which CNES and NASA actively worked well in advance. Presented as revolutionary with a brand-new technology, SWOT offers almost complete coverage of the globe outside the poles: “mesoscale” for the oceans, but above all for continental hydrology (rivers and lakes). Certain rivers have been selected for specific studies.

A working group on space hydrology led by OIEau was set up in 2014, bringing together several partners, French research and institutional players, not only technical and operational ones: AFD, CNES, IRD, INRAE, CNR, CLS, but also private consulting engineering offices such as: *BRL Ingénierie* on the hydrology and hydraulics aspects. Various activities have been carried out with this consortium involving the International Commission for the Congo-Oubangui-Sangha Basin (CICOS set up in 1999).

The aim was to provide by 2022 spatio-temporal variations in the water levels of major rivers, lakes and streams, the flow rates of major rivers as well as ocean levels. Such spatial altimetry data open up a wide range of possibilities, both for scientific research and for operational management of water resources, particularly for major transboundary rivers.

INRAE, in particular G-Eau, with its work and numerous publications recognised by the international community, has been a member of the project’s international scientific team since 2014 and works mainly on hydrological and hydraulic aspects. On 22 July 2019, an INRAE/CNES agreement was signed, bringing together their skills to work towards achieving the SDGs (adaptation of agriculture and the environment to climate change).

The project began with the Senegal river basin with OMVS, and continued with the Niger river basin in collaboration with the basin Authority (NBA) (see brochure of the working group on spatial hydrology).

The Congo River was chosen as an experimental river because it is particularly interesting for its flow rate (the second largest in the world after the Amazon), its size (4,700 km), its challenges (river transport, irrigation, drinking water, hydro-electricity), and its international and transboundary nature (its watershed spans seven countries).

With Pierre-Olivier MALATERRE, the GHOSTE team at G-EAU is reconstructing river flows from data supplied by the satellite.

They are testing their algorithm on around fifty rivers around the world.

All the data will be regularly posted online on Theia land’s Hydroweb site.

#### Ref.

The launch of the SWOT satellite live on 16/12/2022 at 12:46 French time as seen by UMR G-Eau

#### ✓ CNES:

- 2021: Space cooperation between CNES-France and AEB-Brazil: signing of a framework agreement (in French)
- How Space helps to manage water resources (in French). Video of the SWOT satellite launch on 16 December 2022

✓ **Ifremer article:** SWOT mission: soon instantaneous, high-resolution spatial images of the sea level for a better understanding of ocean dynamics (in French)

#### ✓ Shom / Ifremer article:

“In the wake of the SWOT satellite: promising results for a better understanding of our oceans 22/09/2020, project documents: Estimation of River Discharges from SWOT Observations using Data Assimilation and Hydraulic Models

✓ **Working group on spatial hydrology** on OIEau archive French web page <https://www.oieau.fr/eaudoc/notice/Groupe-de-travail-sur-lhydrologie-spatiale-Programme-swot>

• 2019 English brochure: **WG on spatial hydrology:** <https://www.oieau.fr/eaudoc/system/files/34230-bis.pdf>



AFD; CNES; CICOS, OIEau; BRLI



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## ➤ PATDHS – Hydropower Development on the Sanaga River – Technical Assistance Project

### Introduction of regulations on dam safety

Laurent Peyras and Rémy Tourment  
RECOVER, Aix-en-Provence



Cameroon  
2021-2025

#### Ref.

IWMI - International Water Management Institute: Resources <https://www.inbo-news.org/en/incubation/IWRM-Sanaga-Basin>

BESIX Article: Cameroon: temporary river diversion successfully achieved on the Nachtigal hydroelectric project, 21 October 2022

A dam-building project brings many benefits to the host region or nation, but also risks for neighbouring populations and impacts on the environment. Whether to produce water for irrigation, to generate energy or to protect against flooding, dams have repercussions, both positive and negative, that are likely to upset local socio-economic and environmental balances in the medium to long term. This is why designers strive to reconcile technical, economic, environmental and safety issues in the decision-making process prior to implementation.

In Cameroon, the issue of dam safety has arisen because the country has embarked on a major programme to build new dams in order to meet the ever-increasing demand for water and electricity, and to connect new areas in the country and in the Central African sub-region. In addition, a number of old dams are posing safety problems due to their advanced age and/or lack of maintenance, or because the initial design has now been exceeded.

In February 2018, the World Bank signed an agreement with EDC, Cameroon's national electricity operator, to implement the "PATDHS", the "Hydropower Development on the Sanaga River Technical Assistance Project". This river represents around 75% of the region's hydroelectric potential. The ARMP of Cameroon obtained a credit of 24.9 million euros from IDA to finance the PATDHS-UGP MINEE issued in August 2021, an ASMI for consultancy services relating to the implementation of regulations on dam safety with 6 components. The Republic of Cameroon planned to use part of the funding to set up a regulatory framework for dam safety in Cameroon.

This AIMS was then accompanied by another to recruit a consultant in charge of the financial and accounting audit.

The objective is ① to put in place regulations on dams in Cameroon (roles and scope of intervention of stakeholders), and ② to train MINEE senior administrative staff (capacity building).

Along with the law firm Hector Farina Conseil, a Cameroonian law firm, and the local branch of the French engineering firm ISL, INRAE was part of the consortium that responded. In February 2022, the consortium's bid was finally selected. Two INRAE experts were involved in the project.



World Bank-IDA  
MINEE



## ➤ CREWS – West Africa: Assessment of flood early warning systems

**Maria Helena Ramos**  
Hydro -HYCAR unit, Antony



**West Africa(Senegal)**

**2021-2023**

### Ref.

CREWS websites: <https://public.wmo.int/en/climate-risk-and-early-warning-systems-crews>

and CREWS initiative: <https://crews-initiative.org/>

Link to the CREWS West Africa project:

<https://crews-initiative.org/project/west-africa-region-seamless-operational-forecast-systems-and-technical-assistance-capacity/>

As part of the implementation of the CREWS (Climate Risk & Early Warning Systems) West Africa project, WMO and INRAE have signed an agreement to provide expertise that will enable INRAE to propose an analysis of existing early warning systems and recommendations for a methodological framework for forecasting flash floods in West Africa.

For INRAE, this involved: ♦providing expertise and coordination work on the analysis of existing methodologies worldwide and in the region; ♦participating in exchanges with regional centres and other specialists and researchers involved in flood issues in the region; ♦co-organising and conducting interviews with local services identified by the WMO; ♦proposing to the WMO a methodology for operationally flash-floods forecasting in the region, including recommendations concerning possible approaches to be implemented in West Africa enabling the development of knowledge in the region, as well as a consultative plan for monitoring its development and implementation; ♦contributing to the presentation and dissemination of the results; and ♦participating in meetings with the person in charge at the WMO. The INRAE expert report focused on the analysis of warning systems dedicated to flash floods.

Within a broader framework of evaluation of early warning systems for floods and flooding in West Africa, it joins the analyses and reports produced under the coordination of the IRD (regional analysis, also in collaboration with the Gaston Berger University, in St Louis, Senegal) and SEPIA Conseils (analysis of forecasting systems for floods in urban areas).

The aim of the assessment carried out by INRAE was to provide analytical elements that could contribute to the design of an effective methodology for operational flash floods forecasting in West Africa, to be developed and implemented in close collaboration with the relevant regional or national institutions. The study has highlighted the challenges involved in developing a relevant and reliable product or service, adapted to the fine scale of the hydrometeorological processes that cause flash floods.

Opportunities to build on existing proven systems/platforms were discussed, and general steps for an action plan were proposed, based on the three key pillars of flood forecasting (data, models and forecasters).



WMO,  
World Bank–GFDRR



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## Biodiversity, plant bioengineering, soils

### IN THIS CHAPTER

**PAGE 22** CoForMO Project: feasibility study for the use of a mobile data collection and centralisation tool

**PAGE 23** Support to the development of the European Soil Condition Assessment - Soil erosion

**PAGE 23** GoLFor-DEEPN: Local Governance for Forest Resources

**PAGE 24** P3A: Support Program to the Implementation of the Association Agreement

**PAGE 25** World Bank study on the MRV (Monitoring-Reporting-Verification) method for livestock farming

## ➤ CoForMO project: feasibility study for the use of a mobile data collection and centralisation tool

**Julien Ancelin**

Experimental Unit  
at Saint-Laurent-de-la-Prée (DSL),  
Pays-de-la-Loire



**Benin**

5 to 12 January 2019

AFD was asked to support the Communauté Forestière du Moyen-Ouémé (CoForMO) in Benin on a project financed by the French Facility for Global Environment (FFEM) to assess the relevance and feasibility of using mobile data collection and centralization tools in order to improve the monitoring system.

As part of this project and based on CoForMO inventories, the Beninese Laboratory of Ecology, Botany and Plant Biology (LEB) and the National Institute of Agricultural Research of Benin (INRAB) need to acquire and visualise data for their fieldwork. The data to be collected includes:

- the geographical location of the family farms surveyed in the agroforestry series of the forest under management;
- the contact details and other characteristics of the farmer<sup>1</sup> and the landowner of the plots surveyed;
- the permanent quadrats where annual measurements are to be taken;
- transhumance corridors and folding areas marked out in each forest;
- the boundaries of natural areas of exceptional biodiversity for the design of integral protection zones;
- the boundaries of full plantations in degraded forest areas.

To be analysed optimally, this information collected in the field should be regularly integrated into a central server equipped with technologies capable of disseminating data flows to allow all the partners to work on the same reference systems.

Given the specific nature of the data to be collected (mainly cartographic, quantitative, environmental, longitudinal and the like), the digital tool had to facilitate input adapted to the monitoring protocol and be synchronisable with a central system, as well as being financially accessible.

During the support mission for the Mé REDD+ project in Côte d'Ivoire (2016-2019), AFD had previously been able to successfully test the GéoPoppy tool, both a field notebook and a map server, designed by Julien Ancelin.

### Ref.

AFD article: "Côte d'Ivoire: *GeoPoppy* challenges deforestation". May 2018  
<https://www.afd.fr/en/actualites/grand-angle/cote-divoire-geopopy-challenges-deforestation>

Claire Zanus, Julien Ancelin.

"Digital, a magic wand for evaluation?"

In *Évaluations: Rapport 2017-2018*, 63 pages, 2019. hal-02790938 (in French)

INRAE article (in French):

<https://www.inrae.fr/actualites/geopopy>

Écophyto (in French):

*GeoPoppy: method sheet applied to SURVapi*

[https://ecophytopic.fr/sites/default/files/2022-01/fiche\\_methode\\_GeoPoppy.pdf](https://ecophytopic.fr/sites/default/files/2022-01/fiche_methode_GeoPoppy.pdf)

For CoForMO in Benin, Julien Ancelin (DSL, INRAE) was commissioned by Claire Zanus (AFD, EVA dpt) with the financial support of the FFEM and the World Bank's DAEM (Increased Access to Modern Energy Project) platform.

The mission took place from 5 to 12 January 2019. Its purpose was to study the feasibility of setting up such a tool in the field.

AFD/FFEM (DAEM)



## Support to the development of the European Soil Condition Assessment — Soil erosion

Frédéric Darboux  
IGE unit, Grenoble

 Europe  
2022-2023

The study “Support to the development of European soil condition assessment” was dedicated to the impact of soil erosion on human activities and ecosystems. It took the form of a document entitled “Key facts on the role, impact and extent of soil erosion”, listing key- and scientifically validated- facts on soil erosion in Europe. The study was commissioned by the European Environment Agency (EEA). The research was carried out for the European continent, then sequentially for each of the countries of the European Union, with bibliographical references collected using Web of Science and for the publication period 2019-2023.

The study shows that, at present, around 25% of land in the European Union has soil erosion rates above the recommended sustainable threshold, and more than 6% of agricultural land suffers from severe erosion.

The estimated average erosion rate for the long term fell by 0.4% between 2010 and 2016. This decrease of 0.4% in 6 years is much lower than the estimated decrease for the period 2000-2010 (9%). This means that efforts to mitigate soil erosion need to be stepped up with more environmentally-friendly measures, and that areas at high risk of erosion need to be better targeted. Depending on the climate change scenario, an increase of 13% to 22% in the average rate of soil erosion in the EU is estimated, from 3.1 t/ha/yr in 2016 to around 3.6 t/ha/yr. Effective mitigation of future soil loss therefore requires conservation policy measures on at least 50% of agricultural land with erosion rates above 5 t/ha/yr.

 EEA

Ref. EEA press release -  
*Monitoring soil threats in Europe:*  
✓ Report Soil monitoring  
✓ Indicators and thresholds for soil health assessments  
[EEA - Monitoring soil threats in Europe](#)



© EEA

## GoLFor-DEEPN: Local Governance for Forest Resources Development, Environment and Political Economy in Nepal

François Libois  
PjSE unit, Paris

 Nepal  
2018-2024

The GoLFor-DEEPN\* project aims at evaluating the effects of forest management decentralisation in Nepal from the forestry department to the local level on three points: (1) forest cover, (2) collective action within villages and (3) the functioning of the local political system. After decades of deforestation and forest degradation, tree cover slightly improved over the last 20 years. There are no large-scale studies analysing the causes, let alone the consequences.

François Libois, from the Paris School of Economics, coordinated the interdisciplinary GoLFor-DEEPN project, a research programme carried out in collaboration with the CNRS, and structured around three axes: the human geography axis led by Olivia Aubriot (CNRS, CESA), the remote sensing axis led by Nicolas Delbart (University Paris-Cité) and the economics axis led by François Libois (INRAE, PSE). This project was allocated €189k by the ANR, and in the initial period, 2018-2021, €50k by UK AID as part of the “Economic Development and Institutions” programme. The aim was to quantify the contribution of the groups to the stabilisation of Nepal's forest cover, to highlight the underlying mechanisms and to discuss the expected distributional effects, in terms of living standards in the villages but also of local authorities.

The GoLFor-DEEPN project is structured around five testable hypotheses:

- Does returning forest management to its users increase forest cover?
- Does the creation of user groups negatively affect nearby areas? Does it increase the likelihood of the emergence of collective action in neighbouring forests and villages?
- Do use restrictions imposed by user groups increase the adoption of alternative energies and new technologies among villagers living near newly managed areas at local level?
- Does the type of public goods provided reflect inequalities within groups and villages?
- Can local management of a resource, in a system where the executive committee is elected, be seen as a form of proto-democracy that helps to select leaders at higher-level elections?

Ref.

The ANR call for projects Project ANR-18-CE03-0005

Case study: “Forest governance in Nepal: from centralized control to local users cooperatives”  
<https://edi.opml.co.uk/resource/governance-of-forest-in-nepal-from-centralized-control-to-local-users-cooperatives/>

Paris School of Economics (PSE) – Economics for everybody, 5 papers...in 5 minutes! (March 2017): “Forest degradation and economic growth in Nepal” 2003-2010 <https://www.parisschoolofeconomics.eu/fr/economie-pour-tous/archives/5-articles-en-5-minutes/mars-2017/croissance-economique-et-deforestation-le-cas-de-l-himalaya/>

Policy Brief by François Libois, June 2023: “Community forest management: the story behind a success story in Nepal”.

<https://www.parisschoolofeconomics.eu/fr/economie-pour-tous/archives/5-articles-en-5-minutes/mars-2017/croissance-economique-et-deforestation-le-cas-de-l-himalaya/>

Forest governance in Nepal: “from centralized control to local users cooperatives”.  
<https://edi.opml.co.uk/research/forest-governance-nepal-centralized-control-local-users-cooperatives/>

The initial results show that community forestry has indeed contributed to the afforestation of high-altitude areas of Nepal, and discuss the mechanisms behind their action: closure of forests to grazing, planting but also, and above all, easier access to wood substitutes as energy for cooking.

In addition to these scientific results, extensive data collection has been carried out on more than 3,000 forest user groups, providing detailed, digitised mapping that did not previously exist.



ANR- CNRS; UKAID  
Project ANR-18-CE03-0005

© François Libois



## > P3A: Support Program to the Implementation of the Association Agreement DFG capacity-building to implement the forestry strategy

**Christian Dupraz**

ABSys unit, Montpellier  
[INRAE, Cirad, Institut Agro - SupAgro]



**Algeria**

**2020-2022**

### Ref.

DGF leaflet on the P3A twinning project  
Press release of 05 October 2022, the official closure of the Institutional DPVCT Twinning  
Italian Ministry of Foreign Affairs project sheet

In 2004, the European Commission launched a twinning initiative aimed at helping certain independent states in Eastern Europe and the Mediterranean region, such as Algeria, which has an estimated forest heritage of 4,100,000 ha, including 1,700,000 ha of woodland. But although this heritage offers society an extraordinary diversity of goods and services, in some places it is being degraded by ever-increasing anthropic pressure, combined with the effects of climate change. As part of its mission to preserve, promote and enhance this rich heritage, the Directorate General of Forests (DGF) is firmly committed to a sustainable development approach in line with the UN's 2030 Agenda. The objectives of the National Forestry Strategy for the 2035 horizon have been defined with a view to meeting the country's environmental, social and economic needs.

Institutional twinning is an instrument of administrative cooperation that enables beneficiary countries to benefit from the expertise of EU member states in a variety of fields. Of the 6 agreements between France and Algeria, this twinning contract No. DZ 17 ENI AG 01 19, signed on 18 February 2020 and endowed with €1,370 k, is part of the P3A (Supporting Program to the Implementation of the Association Agreement) between Algeria and the European Union.

In conjunction with the Department of Plant Protection and Technical Controls (DPVCT), part of the MADR, a Franco-Italian consortium was set up with the agriculture ministries: the French MASA, the Italian MiPAAFT and the Swedish forestry agency (Skogsstyrelsen). Several Algerian public and technical-scientific organisations were also involved, including the INRAA.

Christian Dupraz, who is an agronomist specialising in temperate agroforestry at the ABSys joint unit, and President of International Union for Agroforestry (IUAF) has taken part in this project.

The aim is to support the Algerian forestry sector by providing the DGF with technical support to strengthen its organisational and operational capacities. This will enable DGF to efficiently implement its National Forestry Strategy, as set out in its leaflet.

The project, involving 50 European experts who will carry out 96 consultancy missions, has 4 components: (1) definition and implementation of a strategy to enhance the value of forest heritage and products (2) strengthening the capacity of the Forestry Administration in terms of strategic management and operational efficiency, (3) definition and implementation of a policy for the continuous improvement of skills, and (4) improving the implementation of strategic frameworks and the management of international conventions.

Once these 4 aspects had been completed, a strategy for developing forest heritage and products was defined, promoted and disseminated.



**Twinning Consortium:**  
France/Senior and Italy/Junior

**Algeria:** DGF, DPVCT and MADR;  
**Italy:** MiPAAF;  
**Sweden:** Skogsstyrelsen;  
**France:** FranceAgriMer



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## World Bank study on the MRV (Monitoring-Reporting-Verification) method for livestock farming)

### Case studies and regional workshops

Jean-François Soussana and Vincent Blanfort

INRAE Presidency - Directorate General, and Cirad (consortium INRAE-CIRAD)



Brazil, Senegal, Vietnam...

2019-2021

**Ref.**

World Bank: "What You Need to Know about the Measurement, Reporting and Verification (MRV) of Carbon Credits"

Animation: Understanding the Measurement, Reporting, and Verification (MRV) of Carbon Credits

Find out more about GHG: Greenhouse Gas Protocol (about-us)

In 2020, the World Bank commissioned INRAE to carry out a study entitled "MRV study for a reduction in GHG emissions from livestock farming in conjunction with a reduction in deforestation". The study is based on the hypothesis that promoting certain intensive livestock farming practices can reduce greenhouse gas (GHG) emissions and at the same time reduce demand for land, provided that measures are implemented to protect forests or develop integrated systems such as agroforestry or mixed crop -livestock systems.

The central theme of the study is therefore the development of methods for monitoring, reporting and verifying GHG emissions, analysing these emissions as well as changes in deforestation, forest degradation and land use.

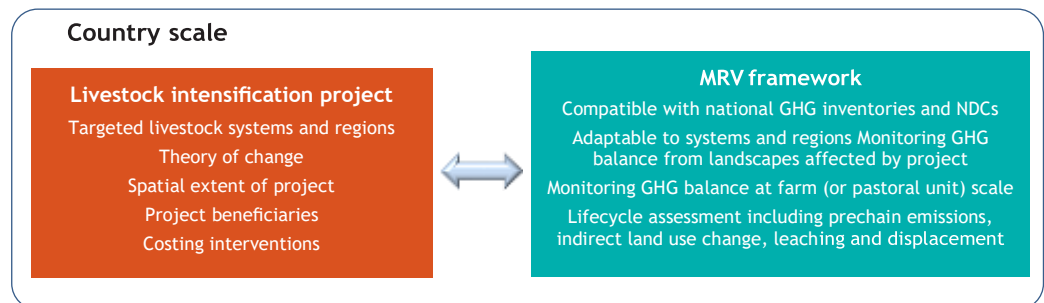
The study carried out by the INRAE-CIRAD consortium was intended to lay the conceptual foundations of this MRV method, which in its operational phase will have to be submitted to a certification structure for approval. Three case studies representing a diversity of production systems, intensification potential of land use change dynamics and public policy environment were selected in Brazil, Senegal and Vietnam. For these 3 case studies, webinars and the mobilisation of regional experts and stakeholders were discussed and documented.

The method proposed by the WB project team after various exchanges and feedback focused on net emissions (in CO<sub>2</sub> equivalent) during the operational phase of a climate project financing livestock farming. A clarification of the scope of the method, which must be based on the scale of a country or region. This allows the entire livestock sector to be addressed, including the specific features and value chains of the regions/countries under consideration. In this case, an operational MRV method could be used for WB green finance projects.



Banque Mondiale (BM/WB)

**Figure 1.** Summary of key specifications of the MRV framework for assessing the impacts of a livestock intensification project



## Water: sanitation (REUSE/REUT)

### IN THIS CHAPTER

**PAGE 26** COSTEA- REUT: Reuse of treated wastewater

**PAGE 27** Training: Providing training on the various treatment processes suitable for small communities in rural areas

**PAGE 27** Massire: Strengthening agricultural and rural innovation systems in oasis and arid zones

**PAGE 28** WWTP- wastewater treatment / renovation of networks using constructed wetlands

**PAGE 29** REUT: methodology for reusing treated wastewater

## ➤ COSTEA-REUT: Reuse of treated wastewater

**Nassim Aït Mouheb**  
GEAU unit, Montpellier

 **Algeria, Morocco, Palestine, Bolivia, Senegal, Tunisia**

2019-2020

### Ref.

**pS-Eau**: 2021 assessment of decentralised cooperation actions on water, sanitation and water resources in the southern Mediterranean countries (in French)

**Occitanie cooperation**: (in French) Water and sanitation in the Mediterranean countries: annual review of decentralised and non-governmental cooperation (pS-Eau)

Poster (in French): <https://www.comite-costea.fr/en/production/poster-de-laction-structurante-reutilisation-des-eaux-usees-traitees-en-agriculture/>



**AFD- RMC/SCP- IME- SE**

The Reuse of Treated Wastewater (REUT) encompasses a variety of projects that are raising a great deal of hope in the countries of the South, especially in agriculture. At the beginning of 2021, the IME (Mediterranean Water Institute) initiated international coordination of the project across six sites: Algeria, Bolivia, Morocco, Palestine, Senegal and Tunisia. Financed by the RMC Agency and AFD as part of its Adapt'Action programme, the project was launched in January 2019 for a period of 12 months and involves the Société du Canal de Provence (SCP) and the Société des Eaux de Marseille (SEM) with the support of various local organisations.

Concerning Tunisia, while the agricultural development groups (GDAs), supervised by the local DGGREE, were launching a drive to modernise their irrigated areas, REUT feasibility studies involving full multi-factor diagnostics and the deployment of pilot projects were being carried out on behalf of the IME, under the supervision of the National Sanitation Utility (ONAS), for which REUT is one of its 6 major R&D themes.

Several visits led to the selection of the sites of Sousse-sud and Mahdia for the implementation of the integrated pilot of REUT in agriculture.

After the financial set-up, it includes:

- (1) the design of the plot irrigation system;
- (2) agronomic expertise and choice of crops;
- (3) execution studies for all the hydraulic structures; and
- (4) the social water management scheme.

This project, carried out in consultation with the sanitation and agricultural sectors, aims to produce results that can be used to advance the REUSE sector in Tunisia as a whole. In fact, in 2021, the majority of projects were taking place in Morocco, in rural areas, and targeted access to drinking water. The projects financed in Lebanon, Palestine and Tunisia are almost all long-term decentralised cooperation projects, involving exchanges of knowledge and skills, as is the case with some French associations.



© INRAE

## ➤ Training: Providing training on the various treatment processes suitable for small communities in rural areas

Rémi Lombard-Latune  
REVERSAAL unit, Lyon

 Tunisia  
2022

### Ref.

ONAS (National Sanitation Utility)  
Annual Operating Report 2020

In Tunisia, the already large number of wastewater treatment plants (WWTPs) is managed by the National Sanitation Utility (ONAS), which publishes the projects completed or underway on its website. AFD finances the implementation of various wastewater management programmes. However, to develop sanitation in rural areas (< 8,000 PE.), ONAS was looking for support in choosing appropriate treatment technologies.

This support included training in the types of macrophyte processes included to respond to the variety of situations in these regions, particularly for capacities of between 5,000 and 8,000 PE and their specific territorial and institutional characteristics. The design of the training course had to take these factors into account, as did the work of Tunisian research institutes, specially on macrophyte processes.

The service commissioned by the AFD included the provision of training in the various treatment processes suitable for small communities in rural areas. This training required the mobilisation of an expert for 7 working days, including 2 days of preparation, with a trip to Tunisia for 5 days of *in situ* training, including a field visit.

 AFD; ONAS

## ➤ Massire: Strengthening agricultural and rural innovation systems in oasis and arid zones

Nassim Aït Mouheb  
and Sami Bouarfa  
GEAU unit, Montpellier

 Algeria  
2019-2023

### Ref.

Massire, the repertoire of innovations: the example of “Family agri-tourism as a solution to the problem of water shortage”. (in French)

### Publications

- Khardi, Y., Lacombe, G., Kuper, M., Taky, A., Bouarfa, S., & Hammani, A. (2023) “Pumping or disappearing: the dilemma of the reinforcement of khetaras by solar pumping in the oases of Morocco”. *Cahiers Agricultures*, 32, 1 (in French)
- Bekaddour S, Ait-Mouheb N, Hartani T (2021) “Re-emergence of dry toilets and fecal nutrient reuse”, in M'zab cities. *Journal of Water, Sanitation & Hygiene for Development*, <https://doi.org/10.2166/washdev.2021.115>

In Algeria, the Massire project (acronym combining “Ma” for “Maghreb”, “ssi” as the French for “innovation system” and “re” for “water resources”) concerns the *wilayah* of Ghardaïa, at the gateway to the Sahara. Water resources, which are mainly underground due to the very low rainfall, are essentially fed by floods caused by the overflowing of wadis following downpours on the southern slopes of the Saharan Atlas. To collect the surface water from the periodic floods, the local people have set up ingenious systems: 125 dikes, 5,600 wells tapping the water table, and 690 boreholes tapping the “Continental Intercalaire”. These are then used both to supply the population with drinking water and to recharge the alluvial aquifers, and for irrigation, particularly palm groves, the dominant crop covering an area of 11,360 ha with 1.3 million palm trees.

Only 54,000 ha of the *wilayah's* soil resources, estimated at around 310,000 ha, are developed. With the introduction of grain maize and alfalfa for livestock feed, the *wilayah* has recently become a dairy farming area, which has seen tremendous growth over the past few years.

Using a participatory approach conducted in collaboration with Cirad, the Massire project aims to identify and select high-potential innovations in water management and to assess the conditions for their adoption for sustainable development in these North African territories.

It will also analyse which of these innovations, some of which are being tried out in the hinterlands, need to be adapted, if this potential is to be fully realised in the face of global environmental and societal changes. It will also build the capacity of young rural family farmers through training and networking.

The aim of the project is to position small-scale family farmers at the heart of sustainable agricultural and rural innovation systems, with the possibility of interacting continuously with innovation players to identify, characterise, plan, implement and evaluate innovations linked to water governance and rural transformation.

Certain hinterland areas of Morocco, Algeria and Tunisia are the scene of rapid agricultural expansion, the dynamism of which is increasing the pressure on water resources. The resource is being depleted, which can cause problems of inequality and threaten the sustainability of agricultural activity in these areas. The heart of sustainable agricultural and rural innovation systems, where they will be able to work continuously with innovation players.

The project thus aims to identify and experiment with technical and organisational innovations in collaboration with local stakeholders. It also involves examining irrigation and agricultural practices, often inspired by agro-ecology, which offer the greatest potential for strengthening the resilience of these areas. The project is reinforcing the skills of those involved in water management, through training and networking. It is developing a North African-wide knowledge network linking young rural men and women in marginal areas with other players, such as irrigator associations, farmer cooperatives, NGOs, government departments, researchers and local start-ups.

Organisations participating in the Massire project:  
Tunisia: INAT, INRGREF;  
Algeria: CREAD and the University Center of Tipaza;  
Morocco: ÉNA-Meknès and IAV Hassan II,  
France: CLERSÉ and for INRAE,  
the INCA team of the G-EAU unit.

 IFAD; Cirad



© Marcel Kuper, Cirad

## ➤ WWTP – wastewater treatment and phytoremediation: renovation of networks using constructed wetlands

### Hải Dương province in Vietnam and Mitsamiouli hospital in Comoros

**Rémi Lombard-Latune**  
REVERSAAL unit, Lyon

 **Vietnam, Comoros**  
2020-2021

#### Ref.

Project fact sheets:  
Comoros (page 11) and Vietnam (page 44)  
[https://www.pseau.org/outils/ouvrages/siaap\\_le\\_siaap\\_bilan\\_de\\_s\\_actions\\_2019\\_2020\\_2021.pdf](https://www.pseau.org/outils/ouvrages/siaap_le_siaap_bilan_de_s_actions_2019_2020_2021.pdf) (in French)

 **AFD- SIAAP- AESN**

In terms of international cooperation, thanks to AFD's FICOL facility, the Sanitation Department of Seine-St-Denis Departmental Council (CD 93) has made it possible to launch two sanitation and wastewater treatment plant projects in 2019 in partnership mainly with SIAAP, as well as the Île-de-France Region, and in part Eau-de-Paris, AESN and CD 94.

The first project took place in Vietnam, in the province and city of Hải Dương. Growing urbanisation combined with a dilapidated sewage system and poor waste management were leading to serious health problems. The CD 93 therefore solicited the SIAAP to undertake the necessary studies and improve the entire sewerage system.

The project involved building:

- ✓ a wastewater collection network in the Nguyễn Trãi district, with 233 households connected to the city network;
- ✓ a wastewater treatment plant using a bacterial bed and constructed wetland for the city's 2 major hospitals;
- ✓ a wastewater treatment plant for the craft village in the Dong Can district.

The project included training for technicians and municipal staff responsible for sanitation, as well as raising awareness among the population, including the implementation of a pilot *lagooning* project. As a result, sanitation has been increased to 75%, with an HDI of 117<sup>e</sup>/189. Following on from the AVEC project in 2018, feasibility studies are being carried out into the needs and future development of the water treatment and recovery sector.

The second project, which took place in the Comoros, received €280k from AFD out of an estimated total of €400k. The meetings (*assises*) of the Franco-Comorian cooperation in June 2017, the assembly and signature of the consortium including the town hall of Mitsamiouli and the association RASMI based in France proved to be rather lengthy. This pilot project concerns the Mitsamiouli hospital in the north of the island of Ngazidja (i.e. Grande-Comore Island), the main island in the Comoros archipelago.

The three goals are to install a sewage system and renovate the drinking water and sanitary networks. The project is due to last almost 2 years and will use constructed wetlands, for example with reeds; one of the REVERSAAL unit's four areas of research (e.g. REFLET platform and EPNAC team). It also includes training for technical staff, especially within the hospital. It also provides for the introduction of a system to guarantee the financial sustainability of the facility and payment for water consumption. Other issues to be addressed include management and regulatory structures, coordination and the institutional framework.

The first project is intended to be particularly lightweight, making it easier to operate and maintain, as well as ensuring its durability and replicability. A summary methodological guide will be produced to provide operational players with a reference tool for managing and implementing the circular economy of wastewater and its by-products in their territories, which are part of the 'southern countries' application area.



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## > REUT: methodology for reusing treated wastewater

Rémi Lombard-Latune  
REVERSAAL unit, Lyon



Morocco and sub-Saharan Africa  
2021-2024

At the end of 2020 and drawing also on the most recent work on REUSE by Rémi Lombard-Latune in the Maghreb, the water solidarity “pS-Eau” network decided to launch a new REUT study for a period of 2 to 3 years, 2022-2024, in collaboration with the RMC Water Agency. It will focus on the methodology of reuse of treated wastewater, the recovery of excreta and their by-products in collective and non-collective sanitation systems in the countries of the southern and eastern Mediterranean and sub-Saharan Africa. The study will take place in Morocco, together with Cadi Ayyad University in Marrakech and with the Cheikh Anta Diop University of Dakar, Senegal.

Today, experiences, methods and strategies are highly diversified but also dispersed, particularly in developing countries, often concentrated around the infrastructures and technical and financial resources of metropolises, which are inaccessible to rural areas.

To address these issues and accompany the players in these countries, it seems necessary to produce a methodological guide that will provide them with practical, technical and contextualised tools. It should summarise theoretical knowledge on the subject (treatment processes, risk management) and its application through the identification and analysis of successful experiences in small communities.

The study will be divided into 4 phases: 1) an inventory of know-ledge on the various treatment processes, for water as well as for sludge and sewage, adapted to the contexts of the South; 2) a synopsis of the management of the health risk associated with pathogenic germs for the reuse and recovery of materials, mainly based on the multi-barrier approach (WHO, 2006); 3) a summary of feedback on existing reuse/recovery practices in the countries of the South; and finally, 4) a report on each of the above points.

### Ref.

pS-Eau: Infographic on access to water and sanitation in Africa: state of play (in French)

pS-Eau 2022, evaluation report on the implementation of a sanitation service using constructed wetlands, Tiznit province, Morocco; projects by Migration & Development (in French)

A summary methodological guide will be produced to provide operational players with a reference tool for managing and implementing the circular economy of wastewater and its by-products in their territories, which are part of the ‘southern countries’ application area.



pS-Eau, AERMC



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## Socio-economics

### IN THIS CHAPTER

- PAGE 30** ISIP II: Geographical Indications (GIs)- Expert contribution to the construction of a postgraduate module for the University of Padjadjaran (UNPAD) in Bandung
- PAGE 31** The economics of reforestation in South Asia
- PAGE 32** EPSF: Poverty and Family Structure Survey: Considering intra-household inequalities to better guide public aid in Senegal
- PAGE 33** SFSC: Supply Chains: research brief

## ➤ ISIP II: Geographical Indications (GIs): Expert contribution to the construction of a postgraduate module for the University of Padjadjaran (UNPAD) in Bandung

**Stéphane Fournier**

Équaliter, INNOVATION unit,  
Institut Agro Montpellier



**Indonesia**  
2017-2021

The Swiss Federal Institute of Intellectual Property (IGE/IPI) carries out numerous bilateral international technical cooperation projects in the field of intellectual property, financed by the State Secretariat for Economic Affairs (SECO and SECOCoop).

In 2020, the IGE implemented phase II of the ISIP project, an Indonesian-Swiss project aimed at strengthening intellectual property rights, via its dedicated contact point for Jakarta.

Stéphane Fournier, Professor at the Institut Agro Montpellier, and Delphine Marie-Vivien, researcher at CIRAD, both with long experience of these issues, were mobilised for this project. The aim was to provide expert input into the design and implementation of a postgraduate module on geographical indications (GIs) for the University of Padjadjaran (UNPAD) in Bandung, Indonesia. Initially, in 2019, the mandate consisted of training the trainers and then collectively defining the content of the training course.

In 2020, the experts provided a distance-learning course and were able to discuss live with the course participants in order to clarify open questions and comments.

In 2021, high-quality virtual course products (scripted PowerPoint presentations with the speaker's image and sound) were produced and sent to UNPAD for subsequent use in future modules.

### Ref.

Press release of 19 April 2021: Indonesian-Swiss Intellectual Property Project (ISIP-II)  
<https://haki.unila.ac.id/2021/indonesian-swiss-intellectual-property-project-isip-ii-virtual-intensive-workshop-on-patent-specification/>

### 2019 Project fact sheet

[https://www.ige.ch/fileadmin/user\\_upload/recht/entwicklungszusammenarbeit/factsheet\\_indonesia\\_phase\\_2.pdf](https://www.ige.ch/fileadmin/user_upload/recht/entwicklungszusammenarbeit/factsheet_indonesia_phase_2.pdf)

### Project Indonesia ISIP II (bilingual English-Indonesian)

[https://www.swisscontact.org/Resources/Persistent/5/9/3/f/593f69145921662fd9d182b3db58a471a03518/Indonesia\\_ISIP\\_Profile\\_bilingual\\_2019.pdf](https://www.swisscontact.org/Resources/Persistent/5/9/3/f/593f69145921662fd9d182b3db58a471a03518/Indonesia_ISIP_Profile_bilingual_2019.pdf)



IGE/IPI DGIP - ASKII

IPI - Swiss Federal Institute of  
Intellectual Property



**UNIVERSITAS  
PADJADJARAN**

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## ➤ The economics of reforestation in South Asia

### Local Governance of Forest Resources: Development, Environment and Political Economy in Nepal

François Libois  
PjSE unit, Paris

South Asia: HKH  
(Hindu Kush Himalaya)  
2021-2023

As a result of climate change, the intensity and frequency of extreme weather events such as heatwaves, cyclones, intense rainfall and droughts have greatly increased, affecting the lives and livelihoods of people around the world.

To limit global warming caused by human activity, it is necessary to limit cumulative emissions of CO<sub>2</sub> and other greenhouse gases. Forest restoration should be able to contribute to limiting global warming. According to the IPCC's 6<sup>th</sup> Assessment Report, in low-and-middle-income countries, such restoration is biophysically possible for 2 billion hectares of forest area. In South Asia, the SANDEE network, hosted by ICIMOD, is carrying out an IDRC-funded research project on the economics of reforestation in 4 countries in the region: Bangladesh, Nepal, Pakistan and Sri Lanka. The specificity of this project is to use primary and secondary data to understand the mechanisms enabling reforestation, both on public and private land, but also to focus on the costs and benefits of these projects for the most marginalised individuals and groups. The study will also provide data to inform policies relating to the restoration of local forests.

François Libois from the PjSE unit is scientific advisor on this project, as is Prof. Jeffrey R. Vincent (Duke University). He has already worked on the link between forest cover and the standard of living of local populations as part of the article "Forest degradation and economic growth in Nepal 2003-2010" published in March 2018.

In addition to his involvement in the above-mentioned project, François Libois is one of the scientific advisers to the SANDEE network. This network offers research grants and support to researchers in South Asia who wish to work on environmental economics issues in their country. The subjects covered include forests, agro-ecology, water and air pollution.



CRDI/IDRC;  
SANDEE/ICIMOD; SIDA (Sweden)

#### Ref.

The Hindu Kush Himalaya (HKH) covers 8 countries: Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar and Pakistan.

GoLFor-DEEPN on ANR website:

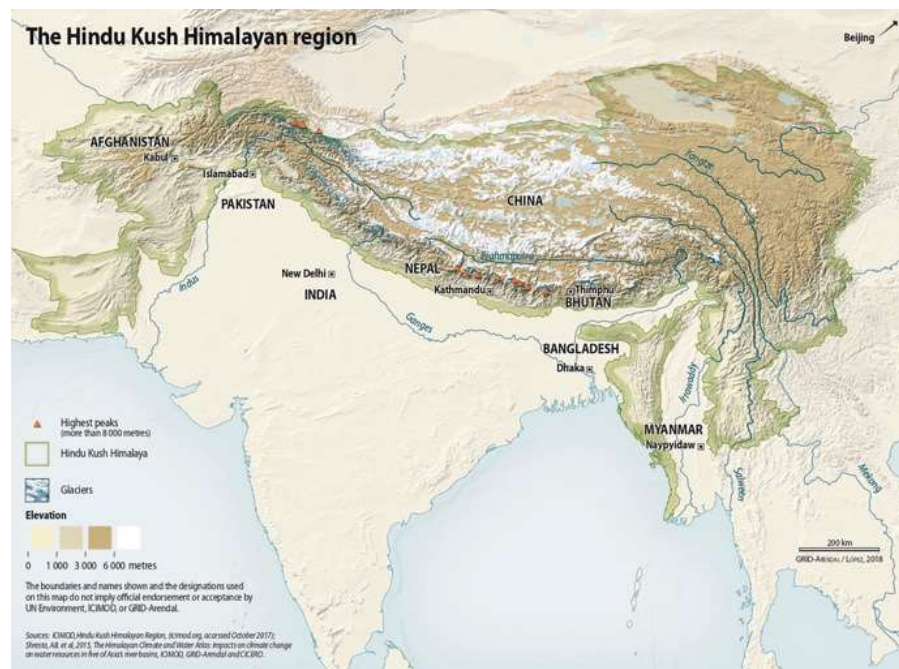
<https://anr.fr/Project-ANR-18-CE03-0005>

#### IDRC-CRDI:

- Economics of forest restoration as a carbon mitigation and nature-based solution in South Asia <https://idrc-crdi.ca/en/project/economics-forest-restoration-carbon-mitigation-and-nature-based-solution-south-asia>

#### ICIMOD-SANDEE:

- Success stories: The economics of biodiversity
- Economics of forest restoration - ICIMOD <https://icimod.org/sandee/economics-of-forest-restoration>
- ICIMOD-SANDEE: About (cf. supra, article *Success stories: The economics of biodiversity*)
- SANDEE-ICIMOD the 2019 flyer call: "Economics of forest restoration and other environmental and natural resource issues" [http://www.sandeeonline.org/uploads/news\\_file/172\\_DOC\\_Flyer\\_-\\_SANDEE\\_Call\\_for\\_Research\\_Concept\\_Notes\\_-\\_Summer\\_2020\\_cycle.pdf](http://www.sandeeonline.org/uploads/news_file/172_DOC_Flyer_-_SANDEE_Call_for_Research_Concept_Notes_-_Summer_2020_cycle.pdf)



## ➤ EPSF: Poverty and Family Structure Survey

### Considering intra-household inequalities to better guide public aid in Senegal

Sylvie Lambert  
PjSE unit, Paris

 Senegal  
2005–2012

Measuring poverty and inequality in a country is a central concern for development economists. This study will help to guide policy measures to help people living below the poverty line.

This measure is generally based on household consumption surveys, which fail to take account of the inequalities that can exist within a single household. In Senegal, the household structure is complex, with several generations living together or several siblings with their respective wives. Each household subgroup may have its own budget, and access to resources may differ greatly from one individual to another within the same household.

To take account of these disparities, a large-scale quantitative survey was carried out in Senegal in partnership with the ANSD, involving 18,000 individuals in 2,000 different households. In this survey, the measurement of household consumption is based on interviews with all adult members of the household who have budgetary responsibilities. This method provides a more complete picture of household consumption and shows how it is distributed between the members of the household. The study reports a 15% increase in household consumption compared with the results obtained from the national survey carried out the same year using the traditional method, which generally targets just one person per household. This difference is essentially due to non-poor households. In fact, the richer the households, the more the standard surveys underestimate their consumption. Real inequality in this economy is therefore higher than previously thought. For example, the *Gini coefficient*, which measures the level of inequality in the distribution of consumption within a country, rises from 0.42 in the traditional survey to 0.5 in this study, putting Senegal in the group of highly unequal countries.

In a completely new way, it also reveals major inequalities within households. These inequalities are such that within households whose per capita consumption is above the poverty line, there are members who live on very few resources. These poor people are invisible because they live in a household that is not poor.

In total, 13.4% of people living in poverty would not be identified as such using standard surveys because they belong to households living above the poverty line. It is therefore important to get as close as possible to individuals in order to obtain more accurate measures of the level of poverty and help public policies to better achieve their targets. Using this new survey for Senegal, in which consumption data was collected at a disaggregated level, this article quantifies the biases associated with data collection that does not take account of how households' function. In total, two opposing effects, one on the average and the other on inequalities, offset each other in terms of the overall poverty rate, but individual poverty statuses are affected. This study also revealed that household structure and organisation are key correlates of inequality within the household and of the individual risk of poverty.

#### Ref.

Philippe De Vreyer, Sylvie Lambert, "*Inequality, Poverty, and the Intra-Household Allocation of Consumption in Senegal*", *The World Bank Economic Review*, Vol. 35, Issue 2, May 2021, pages 414-435, <https://doi.org/10.1093/wber/lhz052>

#### ANSD Report:

The new EPSF survey (in French): <https://www.ansd.sn/sites/default/files/2023-05/RAP-rapport%20de%20resultats%20EPSF%201.pdf>

 ANSD; CRDI/IDRC



© Pixabay



# SFSC: Supply Chains: research brief

Yuna Chiffolleau

INNOVATION unit,  
dpt ACT - SupAgro Montpellier

 Various  
2019-2020

Commissioned in 2018 by the BMGF (Bill & Melinda Gates Foundation) on this subject, the Institute for European Environmental Policy (IEEP) created the ESAD platform in 2019. Building a cross-sector community, this platform coordinates the activities of a very wide range of stakeholders (35 key players in society including industry, civil society, research centres and universities). The aim is to encourage constructive exchanges with European and national decision-makers on the importance of research and innovation in achieving sustainable agriculture. ESAD must also serve to improve the efficiency of investments.

The IEEP wanted to be able to draw on an expert brief on short food supply chains (SFSC) to support the Horizon Europe research and innovation programme and the European Commission's "farm to fork" policy.

Since the 2000s, this subject has attracted increasing attention from researchers studying food systems, due to their growing popularity among consumers, producers and decision-makers, but also because of their potential for the sustainability of food systems.

Yuna Chiffolleau, a recognised expert in this field, and co-leader of the RMT\* Alimentation Locale was co-opted for this project, the deliverable of which, an *expert brief*, was due in March 2020.

The aim was to draw up a state of play of the definitions given to SFSCs in the scientific literature and the impact of these circuits on food systems, considering their modes of governance, both internally and in the context of local food policies in particular. This state of play was based on the most important and recent scientific articles, written in English or French and often stemming from European research and innovation projects (FP7, H2020).

The results were discussed and consolidated as part of a task force led by Yuna Chiffolleau, which helped to identify the priority needs for research and innovation in this area, in a global context marked by numerous crises, particularly health crises, and in which SFSCs are developing while at the same time diversifying.

\***RMT, Réseau Mixte Technologique**: "technical joint local network" on local food, that is financed by the dedicated **Casdar** allocation of the **French ministry of Agriculture**; it provides a package of measures as well as support for public policies.

## Ref.

Expert Brief:

"*Identifying sustainable supply chain is shortening the answer? A State of Play*".

Yuna Chiffolleau, Tara Dourian, INRAE - 2020  
DOI: [10.3390/su12239831](https://doi.org/10.3390/su12239831)

## See also:

- EIP-AGRI Network on Innovative Short Food Supply Chain management
- *Short food circuits* (eres.com editions) ©2019 "Sociologie économique" collection (in French)
- "*Eating in the age of the coronavirus A survey of our food systems*" Edited by Yuna Chiffolleau, Catherine Darrot and Gilles Maréchal: 18/11/2020, Editions Apogée, Le Savoir Boire collection (in French)
- Chiffolleau, Y.; Dourian, T. "*Sustainable Food Supply Chains: Is Shortening the Answer? A Literature Review for a Research & Innovation Agenda*". Sustainability 2020, 12, 9831. <https://doi.org/10.3390/su12239831>
- "*Sustainable Food Supply Chains: Is Shortening the Answer?*" » A Literature Review for a Research and Innovation Agenda
- Interview with Yuna Chiffolleau (in French): rebroadcast at the AgriNovember 2020 forum, "*Short circuits speak volumes*" [5:33]



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## Thematic index

Places, experts .....	34
Units/divisions .....	35
Partners, funding and associate organisation in France and abroad .....	36
Abbreviations/acronyms mentioned in the brochure .....	39

## Geographical index and index of experts/units

### Continents regions ad countries

<b>Africa</b>	<b>South and South-Eas Asia</b>
African continent ..... 10	South Asia
Maghreb (global ..... 27, 29	Hindu Kush Himalaya..... 31
Algeria ..... 24, 26, 27	India (Himachal-Pradesh)..... 11
Morocco ..... 10, 26, 29	Nepal ..... 26, 27
Tunisia..... 26, 27	<b>South-East Asia<sup>3</sup></b>
Sub-Saharan Africa ..... 29	Lower Mekong Basin..... 15
Benin..... 8, 22	Vietnam ..... 25, 28, 35
Cameroon ..... 8, 20	Indonesia..... 30
Congo/DRC..... 6, 19	<b>Americas</b>
Côte d'Ivoire ..... 22	<b>Latin America</b>
Mali ..... 8	Bolivia ..... 26
Senegal ..... 21, 25, 26, 33	Brazil ..... 25
Southern & Eastern Africa.. 17	<b>Europe</b>
Angola, Botswana, Namibia ..... 17	Continental Europe . 14, 16, 23
Nigeria..... 8	Germany, France, Switzerland
Uganda ..... 10	and Netherlands ..... 16
Tanzania ..... 10	<b>International</b>
Southern Africa: Indian Ocean	Various countries ..... 7, 8, 9,
Comoros ..... 28	..... 12, 13, 16, 33
Madagascar ..... 18	

### Experts units - divisions (cf. following page)

<b>NAIT MOUHEB, Nassim</b> ..... 26, 27	<b>LARCHER Thibaut</b> ..... 8
G-EAU - AQUA	PAnTher - SA
<b>ANCELIN Julien</b> ..... 22	<b>LE BIZEC Bruno</b> ..... 8
DSLIP - ACT	LABERCA - AlimH
<b>BOUARFA Sami</b> ..... 13, 27	<b>LEBLOIS Étienne</b> ..... 15
G-EAU – AQUA	RiverLY - AQUA
<b>BLANFORT Vincent</b> ..... 25	<b>LIBOIS François</b> ..... 23, 31
SELMET–CIRAD	PjSE - ÉcoSocio
<b>CAMENEN Benoît</b> ..... 17	<b>LOCONTO Allison Marie</b> ..... 10, 11, 12
RiverLY - AQUA	LISIS - ACT
<b>CHIFFOLEAU Yuna</b> ..... 33	<b>LOMBARD-LATUNE Rémi</b> ... 27, 28, 29
Innovation - ACT	Reversaal - TRANSFORM
<b>DARBOUX Frédéric</b> ..... 23	<b>MALATERRE Pierre-Olivier</b> ..... 19
IGE - AQUA	G-EAU - AQUA
<b>DESBUREAUX Sébastien</b> ..... 6	<b>PEYRAS Laurent</b> ..... 20
CEE-M - ÉcoSocio	Recover - ÉcoDiv
<b>DORÉ Joël</b> ..... 7	<b>RAMOS Maria Helena</b> ..... 21
MICALIS - AlimH	HYCAR - AQUA
<b>DUPRAZ Christian</b> ..... 24	<b>REDLINGSHÖFER Barbara</b> ..... 9
ABSys- AgroÉcoSystèmes	SADAPT - ACT
<b>FOURNIER Stéphane</b> ..... 30	<b>SAUQUET Éric</b> ..... 15
Innovation - ACT	RiverLY - AQUA
<b>HÉRITIER Philippe</b> ..... 12	<b>SCHLICH Pascal</b> ..... 7
TSCF - AgroÉcoSystèmes	CSGA - TRANSFORM
<b>HUMBERT Jean-François</b> ..... 18	<b>SOUBEYRAN Raphaël</b> ..... 6
IEES - SPE	CEE-M - ÉcoSocio
<b>JAYET Pierre-Alain</b> ..... 14	<b>SOUSSANA Jean-François</b> ..... 25
PSAE - ÉcoSocio	Présidence - Direction générale INRAE
<b>LAMBERT Sylvie</b> ..... 32	<b>TOURMENT Rémy</b> ..... 20
PjSE - ÉcoSocio	Recover - ÉcoDiv
<b>LAMOUREUX Nicolas</b> ..... 16	
RiverLY - AQUA	
<b>LANG Michel</b> ..... 16	

## Index of INRAE units

	Leading division
CEE-M .....	Center for Environmental Economics of Montpellier ..... ÉcoSocio
CSGA .....	Centre for Taste and Feeding Behaviour ..... TRANSFORM
DAPP .....	Directorate of Support for Public Policies ..... DGDEAPP
DSLPL .....	Saint-Laurent-de-la-Prée Experimental Farm ..... ACT
G-EAU .....	Water Management, Actors, Territories ..... AQUA
	<i>Team:</i> GHOSTE: Hydraulic Management, Optimization and Supervision of Water Transfers
	<i>Team:</i> INCA: Innovation and Change in Irrigated Agriculture
HYCAR .....	Continental Hydrosystems - Resources, Risks, Restoration ..... AQUA
iEES .....	Institute of Ecology and Environmental Sciences of Paris ..... SPE
	<i>Team:</i> CoMIC: Microbial Communities in Continental ecosystems (DCFÉ)
INNOVATION... ..	Innovation and Development in Agriculture and Food ..... ACT
	<i>Team:</i> Équaliter: Equity- Quality- Food- Territory
LABERCA .....	Laboratory for the Study of Residues and Contaminants in Food ..... AlimH
MAA .....	Agrobioscience Mission, management board ..... CoDIR
LISIS .....	Interdisciplinary Laboratory for Science, Innovation and Society ..... ÉcoSocio
Micalis .....	Microbiology of Food for Health ..... AlimH
PAnTher .....	Animal Pathophysiology & Biotherapy for Muscle and Central Nervous System Disease ..... SA
PjSE .....	Paris-Jourdan School of Economics ..... ÉcoSocio
PSAE .....	Paris-Saclay Applied Economics ..... ÉcoSocio
Recover .....	Risks, ECO-systems, Vulnerability, Environment, Resilience ..... ÉcoDiv
Reversaal .....	Reduce, Reuse, Recover Wastewater Resources ..... TRANSFORM
	<i>Team:</i> EPNAC: urban waters in small and medium-sized municipalities
RiverLy .....	Interdisciplinary Research Unit for the Management and Restoration of River Systems and their Catchments ..... AQUA
	<i>Team:</i> HyBV: Catchment Hydrology
	<i>Team:</i> HyR: River Hydraulics
	<i>Team:</i> EcoFlowS: Multiscale Eco-Hydrology
SADAPT .....	Sciences for Action and Development: Activities, Products, Territories ..... ACT
SELMET .....	Mediterranean and Tropical Livestock Systems ..... ACT
	<i>Team:</i> DEFIT: Dynamics of livestock farms and value chains in the territories
TSCF .....	Technologies and Information Systems for Agrosystems ..... AgroEcoSystem
	<i>Team:</i> ROMEA: Robotics & Mobility for the Environment & Agriculture

## The 9 (of the 14) scientific affiliation INRAE mentioned divisions (and 2 directorates)

ACT .....	Sciences for Action and Transition
AgroEcoSystem .....	Agroecosystems: Agronomy and Environmental Sciences for Agroecosystems
AlimH .....	Human Nutrition and Food Safety
AQUA .....	Écosystèmes aquatiques, ressources en eau et risques
CoDIR .....	<i>Management Board</i>
DGDEAPP .....	<i>Deputy Directorate-General of Expertise and Support for Public Policies</i>
ÉcoDiv .....	Ecology and Biodiversity
ÉcoSocio .....	Economics and Social Sciences for Agriculture, Food and Environment
SA .....	Animal Health
SPE .....	Plant Health and Environment
TRANSFORM .....	Science for Food, Bioproducts and Waste Engineering

# Index of partner, funding and associate organisations in France and abroad

## Governmental bodies, agencies and schemes in France and abroad

### France

AE-RMC	Rhone Mediterranean Corsica Agency
AFD	French Development Agency
AFEID	French Association for Water, Irrigation and Drainage
ANR	French National Research Agency
CIRAD	French agricultural research and international cooperation organization
CNES	French National Centre for Space Studies
CNR	French National Rhone Company
CNRS	French National Centre for Scientific Research
CLS	Collecte Localisation Satellites
FFEM	French Facility for Global Environment
IME	Mediterranean Water Institute
IRD	French National Research Institute for Sustainable Development
OIEau	International Office for Water
SEM	Alsace Moselle Water and Sanitation Syndicate
WWF	World Water Forum

### International (Non-EU)

### country

ABSSA	Benin Food Safety Agency	Benin
ABN	Niger Basin Authority	Niger
ANSSA	Mali National Food Safety Agency	Mali
CEPR	Centre for Economic Policy Research (FCDO)	UK
CICOS	International Commission for the Congo-Oubangui-Sangha Basin	Congo
CILSS	Permanent Interstate Committee for Drought Control in the Sahel	
CIRDES	International Centre for Research and Development on Livestock in Subhumid Zones	
CORAF	West and Central African Council for Agricultural Research and Development	Senegal
DEEPN	Development, Environment and Political Economy in Nepal	Nepal
DGF	Directorate General of Forests (DPVCT)	Algeria
DGGREE	General Directorate of Rural Engineering and Water Exploitation	Tunisia
DIAEA	Directorate of Irrigation and Rural Infrastructure (DIAEA) (MAPDEF)	Morocco
DPVCT	Department of Plant Protection and Technical Controls (MADR)	Algeria
STDF	Standards and Trade Development Facility (WTO)	UNO
FIMABio	Moroccan Interprofessional Federation of the Organic Sector	Morocco
GiZ	German Agency for International Cooperation	Germany
ICIMOD	International Centre for Integrated Mountain Development (HKH: X countries of South Asia)	Nepal
LCSSA	Central Laboratory of Food Safety Control	Benin
MADR	Ministry of Agriculture and Rural Development	Algeria
MAPDEF	Ministry of Agriculture, Fisheries, Rural Development, Water and Forests	Morocco
MARHP	Ministry of Social Affairs, the Ministry of Agriculture, Hydraulic Resources and Fisheries	Tunisia
MIDAS	Modelling Inventory & Knowledge Management Systems	
MiPAAFT	Ministry of agriculture, food sovereignty and forestry	Italy
MINEE	Ministry of Water Resources and Energy	Cameroon
MRC	Mekong River Commission	South-East Asia
NAFDAC	National Agency for Food and Drug Administration and Control	Nigeria
NASA	National Aeronautics & Space Administration	USA
NEPAD	New Partnership for Africa's Development	Africa
NOGAMU	National Organic Agricultural Movement of Uganda	Uganda
ONAS	National Sanitation Utility	Tunisia
ORMVA	Regional Agricultural Development Office	Morocco
PACTE	Programme of adaptation to climate change in vulnerable territories in Tunisia	Tunisia
ViNP	Virunba National Park	Dem. Rep. Congo
RIAM	Network of Agroecological Initiatives in Morocco	Morocco
Skogsstyrelsen	Swedish Forest Agency [Jönköping, SE]	Sweden
AU	African Union	Ethiopia

Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, Pakistan

## International organisations and bodies: Europe and the UN

### EEC, European Union

EEA	European Environment Agency
CAP	Common Agricultural Policy
CAPRI	Common Agricultural Policy Regional Impact (CAP)
JRC	Joint Research Centre
FADN	Farm Accountancy Data Network
HLPD	High Level Political Dialogue UE (Research & Innovation)
IEEP	Institute for European Environmental Policy
IFM-CAP	Individual Farm Model for Common Agricultural Policy Analysis
MIDAS	Modelling Inventory and Knowledge Management System
NUTS-X	Common classification of territorial units for statistics (Eurostats)
P3A	Support Program to the Implementation of the Association Agreement (project)
SFSC	Short Food Supply Chain (EUFIC)

### United Nations

CREWS	Climate Risk & Early Warning Systems (UNO/WMO)
STDF	Standards and Trade Development Facility (WTO -UNO)
FAO	Food & Agriculture Organization
IFAD	International Fund for Agricultural Development
GEF	Global Environment Facility (PNUD)
WMO	World Meteorological Organisation
UNO	United Nations Organisation
CREWS	Climate Risk & Early Warning Systems
HYCOS	HYdrological Cycle Observation System
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
WHYCOS	World HYdrological Cycle Observation System

### Non-governmental organisations

ASKII	Association of Indonesian Intellectual Property Centers	Indonesia
AFEID	French Association for Water, Irrigation and Drainage	France
IAWA	International Association on Work in Agriculture (INRAE)	France
Ran'Eau	Reference network for stakeholders in water, sanitation and hygiene	Madagascar
TOAM	Tanzania Organic Agriculture Movement (Kilimohai)	Tanzania
TI (France)	Transparency International	France/world

### Academic partners: universities, research institutes

CIRDES	International Centre for Research and Development on Livestock in Subhumid Zones	Burkina-Faso
CLERSÉ	Lille Centre for Sociological and Economic Research and Studies	France
CNRS	French National Centre for Scientific Research	France
CPC	Centre Pasteur in Cameroon	Cameroon
CREAD	Research Center for Applied Economics for Development, Alger	Algeria
UC of Tipaza	University Center of Tipaza (Oued Merzoug, Tipaza)	Algeria
DTU	Technical University of Denmark	Denmark
ÉNA Meknès	National School of Agriculture of Meknes	Morocco
ETH	Federal Institute of Technology, Zurich	Switzerland
IAV Hassan II	Institute of Agronomy and Veterinary Medicine Hassan II (Rabat/Agadir)	Morocco
IME	Mediterranean Water Institute	France
IWMI	International Water Management Institute	Sri Lanka
INAT	National Agronomic Institute of Tunisia (Tunis-Mahrajene)	Tunisia
INRGREF	National research Institute of rural engineering, Water and Forests (Tunis)	Tunisia
INRAA	National Institute of Agronomic Research of Algeria	Algeria
INRAB	National Institute of Agricultural Research of Benin	Benin
IISD	International Institute for Sustainable Development (think-tank)	Canada
LEB	Laboratory of Ecology, Botany and Plant Biology (university of Parakou)	Benin
LTA	Laboratory of Food Technology (think-tank WATHI), Dakar	Senegal
RAND Europe	Research and Development (a nonprofit research organisation)	UK, EU, NL
SIDA	Swedish International Development cooperation Agency	Sweden
UB	University of Botswana, Gaborone	Botswana
UAN	Agostinho Neto University, Luanda	Angola
UNAM	University of Namibia, Windhoek	Namibia
UVA	University of Marrakech Cadi Ayyad	Maroc
UCAD	Cheikh Anta Diop university, Dakar	Senegal
UAntwerpen	University of Antwerp, Antwerp	Belgium
UGB	Gaston Berger university, Saint-Louis Senegal	Senegal
UNPAD	University of Padjadjaran, Bandung	Indonesia

## Projects: index of main acronyms\*

Nom	Title or purpose	Localisation	Experts
BBB	Build Back Better (technologies framework for food waste reduction (UNO) .....	international/general .....	B. Redlinshöfer
BRICKS	Building Resilience through Innovation Communication & Knowledge Services .....	.....	.....
CoForMO	Communauté Forestière du Moyen-Ouémé (GéoPoppy) .....	Benin .....	J. Ancelin
COSTEA	Scientific and Technical Committee for Agricultural Water (phase X) .....	INRAE .....	S. Bouarfa
COSTEA-REUT	COSTEA-Reuse of treated wastewater - setting up an agricultural .....	Tunisia .....	N. Aït Mouheb
CREWS	Climate Risk & Early Warning Systems: evaluation of warning systems (WMO) pilot scheme ....	West Africa .....	M-H. Ramos
DMD	Duchenne Muscular Dystrophy: Evaluation of a gene therapy (Pfizer).....	international/ general .....	T. Larcher
DEEPN	Development, Environment and Political Economy in Nepal.....	Nepal .....	F. Libois
TDSs	Total Diet Studies (ANSES/FAO/WHO) .....	Sub-Saharan Africa .....	B. Le Bizec
eCooker	The promise of ecooking (reforestation, improving livelihoods and peace) .....	RDC.....	S. Desbureaux, R. Soubeyran
EPSF	Poverty and Family Structure Survey (intra-household inequalities) .....	Senegal.....	S. Lambert
GoLFor-DEEPN	Local Governance of Forest Resources-DEEPN (see above) .....	Nepal .....	F. Libois
HKH	Hindu Kuch Himalaya- The economics of reforestation in South Asia.....	South Asia .....	F. Libois
IFM-CAP	Individual Farm Model for Common Agricultural Policy Analysis EU .....	international/general .....	P-A. Jayet
IIABA	Institutional Innovations for Organic Agriculture in Africa (AfrONet) .....	Morocco, Uganda .....	.....
	.....	Tanzania .....	A-M. Loconto
IIAD	institutional innovations for sustainable agriculture FAO .....	international/general .....	A-M. Loconto
ISIP	Indonesian-Swiss Intellectual Property Project - university UNDAP .....	Indonesia/Switzerland .....	S. Fournier
MASSIRE	Maghreb - Innovation systems- Water Resources .....	Maghreb.....	N. Aït Mouheb, S. Bouarfa
MRV	Measurement, Reporting and Verification: Study/regional workshops .....	Brazil, Senegal, Vietnam .....	.....
OKACOM	Okavango River Basin Water Commission: CORB sediment assessment study .....	Botswana, Namibia, Angola .....	B. Camenen
P3A	Support Program to the Implementation of the Association Agreement .....	Twinning-EU –EU	.....
PATDHS	Hydropower Development on the Sanaga River Technical Assistance Project.....	Cameroon .....	L. Peyras, R. Tourment
RAND Europe	CDI: survey entitled “C. difficile patient journey” .....	international/general .....	J. Doré
REUT	Reuse of treated wastewater - methodology .....	Morocco and Sub-Saharan Africa .	R. Lombard-Latune
SAFE-M	Supporting learning and training on water in Madagascar .....	Madagascar .....	J-F. Humbert
SFSC	Short Food Supply Chain (cf. EUFIC) .....	international/general .....	Y. Chiffolleau
WWTP	wastewater treatment / renovation of networks using constructed wetlands .....	Vietnam, Comoros .....	R. Lombard-Latune
SWOT	Surface Water and Ocean Topography: working group spatial hydrology .....	Congo .....	P-O. Malaterre
TDSs	Total Diet Studies (ANSES/FAO/WHO) .....	Sub-Saharan Africa .....	B. Le Bizec
TDS-TimeSens	Temporal Dominance of Sensations (analysis software) .....	international/general .....	P. Schlich
WaSaf	Water Sources in Africa: feedback .....	Sub-Saharan Africa .....	J-F. Humbert

\* some projects have no known acronym

## Socio-economic partners

## Financial organisations and schemes

		head office/main site
ARC	Africa Resource Centre	South Africa
FFEM	French Facility for Global Environment (AFD)	AFD, France
FID	Fund for Innovation in Development (AFD)	AFD, France
FISONG	Sectoral Innovation Facility for Non- Governmental Organization [AFD]	AFD, France
IDA	International Development Association (WB)	France
WB	World Bank	USA
BMGF	Bill & Melinda Gates Foundation	USA
CRDI/IRDC	International Development Research Center, Ottawa	Canada
DAEM	Increased Access to Modern Energy Project (WB platform)	Cameroon



## Design and consultancy firms

BRLI	BRLI Ingénierie (part of the BRL group: Languedoc-Roussillon-Midi-Pyrenees Regional Council's Regional Water System concession-holder)	France
IDEE Aquaculture	Marine and Continental Aquaculture Design Office	France
ISL	ISL Ingénierie	France
RAND Europe	Research and Development (a nonprofit research organisation)	UK, EU, NL

## Socio-professional companies and partners

		head office/main site
Barry Callebaut Belgium NV		Belgium
CNR	French National Rhone Company	France
CTN	Tunisian shipping company	Tunisia
EDC	Electricity Development Corporation	Cameroon
EPC	Electric Pressure Cookers (eCooker)	Africa
EureKare	Biotechnology start-up	France/Belgium/Luxemburg
Ferring International Center	Biopharmaceutical company	Switzerland
INOVALYS	Analysis laboratory (Angers)	France
Nestec	a subsidiary of The Nestlé Group	Switzerland
Pfizer	Pharmaceutical Industry	USA, France/world
SCP	Société du Canal de Provence	France
SEM	Société des Eaux de Marseille	France
SEPIA Conseils	Consulting engineering firm	France
SESCOM	Sustainable Energy Services Company	Tanzania
Virunga Energy	Production and distribution of electricity	Democratic Republic of Congo



## Other abbreviations and acronyms

English	 196 abbreviations with meaning	Region/country (or international body)	French or other	 correspondence in French and/or main language
ABSSA	Benin Food Safety Agency	Benin	<a href="#">ABSSA</a>	Agence Béninoise de Sécurité Sanitaire des Aliments
AE-RMC	Rhone Mediterranean Corsica – Water Agency (same as RMC)	Corsica, France	<a href="#">AE-RMC</a>	Agence de l'Eau – Rhône-Méditerranée, Corse (idem RMC)
AFD	French Development Agency	France	<a href="#">AFD</a>	Agence Française du Développement
AFEID	French Association for Water, Irrigation and Drainage	France	<a href="#">AFEID</a>	Association Française pour l'Eau, l'Irrigation et le Drainage
AfrONet	African Organic Network	Africa	<a href="#">AfrONet</a>	African Organic Network
ANR	French National Research Agency	France	<a href="#">ANR</a>	Agence Nationale de la Recherche
ANSD	National Agency for Statistics and Demography	Senegal	<a href="#">ANSD</a>	Agence Nationale de la Statistique et de la Démographie
ANSSA	Mali National Food Safety Agency	Mali	<a href="#">ANSSA</a>	Agence Nationale de la Sécurité Sanitaire et des Aliments, Mali
APP-[E]APP	[Expertise &] Support for Public Policies	(INRAE) France	<a href="#">APP-[E]APP</a>	[Expertise &] Appui aux Politiques Publiques
ARC	Africa Resource Centre	Southern Africa	<a href="#">ARC</a>	Africa Resource Centre
ARMP	Public Contracts Regulatory Agency	Cameroon	<a href="#">ARMP</a>	Agence de Régulation des Marchés Publics
AROPAj	Agriculture, Recomposition of Supply & Agricultural Policy (LabEx BASC)	(INRAE) France	<a href="#">AROPAj</a>	Agriculture, Recomposition de Offre et Politique Agricole (LabEx BASC)
ASKII	Association of Indonesian Intellectual Property Centers (UMM)	Indonesia	<a href="#">ASKII</a>	Asosiasi Sentra Kekayaan Intelektual Indonesia (UMM)
ASMI	(Notice of Request for Expression of Interest (cf. CPPA/ARMP)	Cameroon	<a href="#">ASMI</a>	Avis à Sollicitation de Manifestation d'Intérêt (ARMP)
AU	African Union	Ethiopia, Africa	<a href="#">UA</a>	Union Africaine
BBB	Build Back Better USA	USA	<a href="#">BBB</a>	Build Back Better
BDM	Bachelor-Master-Doctorate system (cf. EQF and ECTS*)	European Union	<a href="#">LMD</a>	Licence, Master, Doctorat (réforme BMD: Bachelier, Master, Doctorat)
BMGF	Bill & Melinda Gates Foundation	USA	<a href="#">BMGF</a>	Bill & Melinda Gates Foundation
BRLI	Bas-Rhône & Languedoc Ingeneering, BLR group	France	<a href="#">BRLI</a>	Bas-Rhône & Languedoc Ingénierie, groupe BLR
CAP	Common Agricultural Policy	European Union	<a href="#">PAC</a>	Politique Agricole Commune
CAPRI	Common Agricultural Policy Regional Impact	European Union	<a href="#">CAPRI</a>	Impact Régional de la Politique Commune Agricole
CDI	Clostridioides difficile infections	general	<a href="#">ICD</a>	Infections à Clostridioides difficile
CeMeB	Méditerrananean Centre for Environment and Biodiversity	France	<a href="#">CeMeB</a>	Centre Méditerranéen de l'Environnement et de la Biodiversité
CEPR	Centre for Economic Policy Research	United Kingdom	<a href="#">CEPR</a>	Centre de Recherche en Politiques Économiques
CICOS	International Commission for the Congo-Oubangui-Sangha Basin	Congo	<a href="#">CICOS</a>	Commission Internationale du Bassin Congo-Oubangui-Sangha
CILSS	Permanent Interstate Committee for Drought Control in the Sahel	Sahel (Africa)	<a href="#">CILSS</a>	Comité permanent Inter-états de Lutte contre la Sécheresse dans le Sahel
CIPR	International Commission for the Protection of the Rhine river	CH-FR-GE	<a href="#">CIPR</a>	Commission Internationale pour la Protection du Rhin [IKSR in German]
CIRAD	French agricultural research and international cooperation organization	France	<a href="#">CIRAD</a>	Centre de coopération Internationale en Recherche Agronomique pour le Développement
CIRDES	International Centre for Research & Development on Livestock in Subhumid zones	Burkina Faso	<a href="#">CIRDES</a>	Centre International de Recherche-Développement sur l'Élevage en zone Subhumide
CLERSE	Lille Centre for Sociological and Economic Research and Studies	France	<a href="#">CLERSE</a>	Centre Lillois d'Études et de Recherches Économiques
CLS	Collecte Localisation Satellites	France	<a href="#">CLS</a>	Collecte Localisation Satellites
CNES	French National Centre of Spatial Studies	France	<a href="#">CNES</a>	Centre National d'Études Spatiales
CNR	National Compagny of Rhône river	France	<a href="#">CNR</a>	Compagnie Nationale du Rhône
CNRS	National Centre of Scientific Research	France	<a href="#">CNRS</a>	Centre National de la Recherche Scientifique
CoDIR	Management Board	France	<a href="#">CoDIR</a>	Comité (ou Conseil) de Direction
CoForMO	Communauté Forestière du Moyen-Ouémé	Benin	<a href="#">CoForMO</a>	Communauté Forestière du Moyen-Ouémé
CORAF	West and central African Council for Agricultural Research & Development	Western Africa	<a href="#">CORAF</a>	Conseil ouest & centre-africain de Recherche & Développement Agricoles
CORB	Cubango-Okavango River Basin	Angola, Botswana, Namibia	<a href="#">CORB</a>	Bassin fluvial Cubango-Okavango
COSTEA	Scientific and Technical Committee for Agricultural Water	(INRAE) France	<a href="#">COSTEA</a>	COmité Scientifique et Technique de l'Eau Agricole
CPC	Centre Pasteur in Cameroon	Cameroon	<a href="#">CPC</a>	Centre Pasteur du Cameroun
CPPA	Cameroon Public Procurement Authority	Cameroon	<a href="#">ARMP</a>	Agence de Régulation des Marchés Publics
CREAD	Research Center for Applied Economics for Development	Algeria	<a href="#">CRÉAD</a>	Centre de Recherche en Économie Appliquée pour le Développement
CREWS	Climate Risk & Early Warning Systems	UNO-ONU	<a href="#">CREWS</a>	Climate Risk & Early Warning Systems
CTN	Tunisian shipping company	Tunisia	<a href="#">CTN</a>	Compagnie Tunisienne de Navigation
CW	Constructed wetland [phytoremediation (cf. WWTP or REUT/REUSE)]	general	<a href="#">FPV</a>	Filtres Plantés de Végétaux (cf. REUT/REUSE)
DAEM	Increased Access to Modern Energy Project (platform)	WB / BM	<a href="#">DAEM</a>	Développement de l'Accès à l'Énergie Moderne (plateforme)
DEEPN	Development, Environment and Political Economy in Nepal	Nepal	<a href="#">DEEPN</a>	Développement, Environnement et Économie Politique au Népal



\* ECTS: European Credits Transfer System

Web links 195 indications	English	other or / main language	type
<a href="https://agriculture.gouv.bi/abssa/">https://agriculture.gouv.bi/abssa/</a>		Fr/Ar	govern/agency
<a href="https://www.eaurmc.fr/">https://www.eaurmc.fr/</a>	X		govern/agency
<a href="https://www.afd.fr/en">https://www.afd.fr/en</a>	X		govern/agency
<a href="https://www.afeid.org/">https://www.afeid.org/</a>	X	Fr	govern/agency
<a href="https://eoai-africa.org/afroenet/">https://eoai-africa.org/afroenet/</a>	X		multilateral
<a href="https://anr.fr/en/">https://anr.fr/en/</a>	X		govern/agency
<a href="https://www.ansd.sn/">https://www.ansd.sn/</a>	tr.	Fr	govern/agency
<a href="http://41.73.116.155:8000/anssamali/index.php">http://41.73.116.155:8000/anssamali/index.php</a>		Fr	govern/agency
<a href="https://www.inrae.fr/en/collaborate/expertise-and-support-public-policies">https://www.inrae.fr/en/collaborate/expertise-and-support-public-policies</a>	X		administration
<a href="https://www.africareourcecentre.org/en/">https://www.africareourcecentre.org/en/</a>	X		acad./sciences
<a href="https://armp.cm/lang?val=en">https://armp.cm/lang?val=en</a>	X	Fr/Ar	govern/agency
<a href="https://basc.hub.inrae.fr/recherche/modeles/aropaj">https://basc.hub.inrae.fr/recherche/modeles/aropaj</a>		Fr	acad./sciences
<a href="https://www.umm.ac.id/en/berita/askii-sebagai-optimalisasi-wadah-tukar-pengalaman-dan-pengelolaan-sentra-hki.html">https://www.umm.ac.id/en/berita/askii-sebagai-optimalisasi-wadah-tukar-pengalaman-dan-pengelolaan-sentra-hki.html</a> ( <a href="https://askii.or.id/">https://askii.or.id/</a> )	X	Id/Ar	govern/agency
<a href="https://armp.cm/filtres?type=avis&amp;val=12">https://armp.cm/filtres?type=avis&amp;val=12</a>	x	Fr	govern/agency
<a href="https://au.int/en">https://au.int/en</a>	X	De	multilateral
<a href="https://www.whitehouse.gov/build-back-better/">https://www.whitehouse.gov/build-back-better/</a>	X		project/program.
<a href="https://www.slideserve.com/fahim/objectives-of-this-session">https://www.slideserve.com/fahim/objectives-of-this-session</a>	X		acad./sciences
<a href="https://www.gatesfoundation.org/">https://www.gatesfoundation.org/</a>	X		funding
<a href="https://brli.brl.fr/en">https://brli.brl.fr/en</a>	X	Fr	sociopro
<a href="https://agriculture.ec.europa.eu/common-agricultural-policy_fr">https://agriculture.ec.europa.eu/common-agricultural-policy_fr</a>	X	(EU)	EU-UE
<a href="https://capri-model.org/dokuwiki/doku.php">https://capri-model.org/dokuwiki/doku.php</a>	X		EU-UE
<a href="https://www.ecdc.europa.eu/en/clostridioides-difficile-infections">https://www.ecdc.europa.eu/en/clostridioides-difficile-infections</a>	X	Fr	general
<a href="https://labex-cemeb.org/en">https://labex-cemeb.org/en</a>	X	Fr	acad./sciences
<a href="https://cepr.org/">https://cepr.org/</a>	X		acad./sciences
<a href="https://www.cicos.int/">https://www.cicos.int/</a>	X		multilateral
<a href="http://www.cilss.int/">http://www.cilss.int/</a>			multilateral
<a href="https://www.iksr.org/en/">https://www.iksr.org/en/</a>	X		multilateral
<a href="https://www.cirad.fr/en">https://www.cirad.fr/en</a>	X	Fr	acad./sciences
<a href="https://www.cirdes.org/">https://www.cirdes.org/</a>			acad./sciences
<a href="https://clerse.univ-lille.fr/">https://clerse.univ-lille.fr/</a>		Fr	acad./sciences
<a href="https://www.cls.fr/en/cls-group/">https://www.cls.fr/en/cls-group/</a>	X	Fr	multilateral
<a href="https://cnes.fr/en/">https://cnes.fr/en/</a>	X	Fr	acad./sciences
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<a href="https://www.cnrs.fr/en">https://www.cnrs.fr/en</a>	X	Fr	acad./sciences
<a href="https://www.glowbl.com/blog/en/the-codir-pillar-of-corporate-governance/">https://www.glowbl.com/blog/en/the-codir-pillar-of-corporate-governance/</a>	X		administration
<a href="https://coformo.org/">https://coformo.org/</a>			multilateral
<a href="https://www.coraf.org/?locale=en">https://www.coraf.org/?locale=en</a>	X		multilateral
<a href="https://www.okacom.org/cubango-okavango-river-basin-corb">https://www.okacom.org/cubango-okavango-river-basin-corb</a>	X		project/program.
<a href="https://www.comite-costea.fr/en/">https://www.comite-costea.fr/en/</a>	X	Fr	project/program.
<a href="https://www.pasteur-yaounde.org/index.php/fr/">https://www.pasteur-yaounde.org/index.php/fr/</a>		Fr	acad./sciences
<a href="https://armp.cm/lang?val=en">https://armp.cm/lang?val=en</a>	X		govern/agency
<a href="https://www.cread.dz/en/home-2/">https://www.cread.dz/en/home-2/</a>	X		acad./sciences
<a href="https://www.crews-initiative.org/en">https://www.crews-initiative.org/en</a>	X		UNO-ONU
<a href="https://www.ctn.com.tn/">https://www.ctn.com.tn/</a>		Fr	sociopro
<a href="https://eng-reversaal.lyon-grenoble.hub.inrae.fr/equipment-platforms/reflet">https://eng-reversaal.lyon-grenoble.hub.inrae.fr/equipment-platforms/reflet</a>	X	Fr	general
<a href="https://direction-energie.gouv.bi/apropos/activites-regaliennes.html">https://direction-energie.gouv.bi/apropos/activites-regaliennes.html</a>			project/program.
<a href="https://edi.opml.co.uk/research/forest-governance-nepal-centralized-control-local-users-cooperatives/">https://edi.opml.co.uk/research/forest-governance-nepal-centralized-control-local-users-cooperatives/</a>	X		project/program.
<a href="https://umr-selmet.cirad.fr/en/l-unite/organisation/defit/contexte-et-objectifs">https://umr-selmet.cirad.fr/en/l-unite/organisation/defit/contexte-et-objectifs</a>		Fr	dpt/unit/team





English	 196 abbreviations with meaning	Region/country (or international body)	French or other	 correspondence in French and/or main language
DÉFIT	Dynamics of livestock farms and value chains in the territories	(INRAE) France	DÉFIT	Dynamiques des Élevages et Filières dans les Territoires
DGD	Deputy Directorate (or Director) General	European Union	DGD	Direction (ou Directeur/Directrice) Général[e] Délégué[e]
DGD-EAPP	Deputy-Directorate-General of Expertise and Support for Public Policies	(INRAE) France	DGD-EAPP	Direction Générale Déléguée Expertise & Appui aux Politiques Publiques
DGF	Direction Générale des Forêts (DPVCT)	Algeria	DGF	Direction Générale des Forêts (DPVCT)
DGGREE	General Directorate of Rural Engineering and Water Exploitation	(MARHP)Tunisia	DGGREE	Direction Générale du Génie Rural et de l'Exploitation des Eaux
DG-INTPA	Directorate-General for International Partnerships	European Union	DG-INTPA	DG Partenariats internationaux
DGIP	Directorate General of Intellectual Property	Indonesia	DGIP	Directorate General of Intellectual Property
DIAEA	Directorate of Irrigation and Rural Infrastructure (Ministry of Agriculture)	Morocco	DIAEA	Direction Irrigation & Aménagement de l'espace agricole (Min. Agriculture)
DMD	Duchenne Muscular Dystrophy	general	DMD	Dystrophie Musculaire de Duchenne
DPVCT	Department of Plant Protection and Technical Controls	(MADR) Algeria	DPVCT	Direction de la protection des végétaux & des Contrôles Techniques
DTU	Technical University of Denmark	Denmark	DTU	Danmarks Tekniske Universitet / Université technique du Danemark
EAPP	Expertise & Support for Public Policies	general	EAPP	Expertise & Appui aux Politiques Publiques
EAT	Total Diet Study	Sub-Saharan Africa	EAT	Études Alimentation Total
EAWAG	Swiss Federal Institute of Aquatic Science and Technology	Switzerland	EAWAG	Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung & Gewässerschutz
EDC	Electricity Development Corporation Cameroon	Cameroon	EDC	Electricity Development Corporation (Cameroun)
EEA	European Environment Agency / Agence Européenne de l'Environnement	European Union	EEA	Agence Européenne de l'Environnement
EMF	Environmental-Monitoring-Framework	UNECE	EMF	Environmental-Monitoring-Framework (cadre de surveillance de l'environnement)
ÉNA Meknès	National School of Agriculture of Meknes	Morocco	ÉNA Meknès	École Nationale d'Agriculture de Meknès
EPC	Electric Pressure Cookers (eCooker)	(Africa)	EPC	Electric Pressure Cookers (eCooker)
EPI	International Project Expertise/assessment	(INRAE) France	EPI	Expertise-Projet Internationale
EPSF	Poverty and Family Structure Survey	Africa	EPSF	Enquête Pauvreté et Structure Familiale
ESAD	European Sustainable Agriculture Dialogue (LIFE programme)	European Union	ESAD	European Sustainable Agriculture Dialogue (LIFE programme)
ETH	Federal Institute of Technology	Switzerland	ETH	Eidgenössischen Technischen Hochschulen / Université Technique Fédérale
FADN	Farm Accountancy Data Network	European Union	RICA	Réseau d'Information Comptable Agricole
FANDC	Standards and Trade Development Facility, WTO	UNO-ONU	STDF	Fonds pour l'Amélioration des Normes & le Développement du Commerce, OMT/WTO
FAO	Food & Agriculture Organization	UNO-ONU	FAO	Food & Agriculture Organization
FCDO	Foreign, Commonwealth & Development Office	United Kingdom	FCDO	Office britannique du Développement et des affaires étrangères et du Commonwealth
FFEM	French Facility for Global Environment (AFD)	France	FFEM	Fonds Français pour l'Environnement Mondial (AFD)
FID	Fund for Innovation in Development (AFD)	France	FID	Fonds d'Innovation pour Développement (AFD)
FIDA	International Fund for Agricultural Development	UNO-ONU	IFAD	Fonds International de Développement Agricole
FIMABio	Moroccan Interprofessional Federation of the Organic Sector	Morocco	FIMABio	Fédération Interprofessionnelle Marocaine de l'Agriculture Biologique
FISONG	Sectoral Innovation Facility for Non-Governmental Organizations [AFD]	France	FISONG	Facilité d'Innovation Sectorielle pour les ONGs [AFD]
FWO	Research Foundation – Flanders	Belgium	FWO	Fonds Wetenschappelijk Onderzoek – Vlaanderen
GDA	Agricultural Development Groups	France	GDA	Groupements de Développement Agricole
GES	GreenHouse Gas	general	GHG	Gaz à Effet de Serre
GFDRR	Global Facility for Disaster Reduction & Recovery	WB / BM	GFDRR	Global Facility for Disaster Reduction & Recovery
GoLFor	Gouvernance Locale des Forêts (UK programme EDI)	European Union	GoLFor	Gouvernance Locale des Forêts (EDI programme UK)
HKH	Hindou Kouch Himalaya	South Asia	HKH	Hindou Kouch Himalaya Asie du Sud-Est)
HLPD	High Level Political Dialogue (R&I)	European Union	HLPD	High Level Political Dialogue (R&I)
HSS or SHS	Humanities & Social Sciences / Social & Human Sciences (cf. UNESCO)	general	SHS	Sciences Humaines et Sociales
HYCOS	HYdrological Cycle Observation System (WMO)	WMO	HYCOS	HYdrological Cycle Observation System (OMM/WMO)
IAV	Institute of Agronomy and Veterinary medicine Hassan II	Morocco	IAV	Institut Agronomique et Vétérinaire Hassan-II, Maroc
IAWA	International Association on Work in Agriculture (INRAE)	(INRAE) France	IAWA	International Association on Work in Agriculture (INRAE)
ICIMOD	International Centre for Integrated Mountain Development	European Union	ICIMOD	International Centre for Integrated Mountain Development
IDA	International Development Association	WB / BM	IDA	International Development Association
IdEx	Initiative of Excellence	France	LabEx	Initiative d'Excellence
IDRC	International Development Research Center	(Ottawa) Canada	CRDI	Centre de Recherche & Développement International
IEEP	Institute for European Environmental Policy	European Union	IEEP	Institute for European Environmental Policy
IFM-CAP	Individual Farm Model for Common Agricultural Policy Analysis	European Union	IFM-CAP	Individual Farm Model for Common Agricultural Policy Analysis
IFOAM	International Federation of Organic Agriculture Movements	European Union	IFOAM	International Federation of Organic Agriculture Movements

Web links 195 indications	English	other or /main language	type
<a href="https://euemployment.eu/glossary/deputy-director-general">https://euemployment.eu/glossary/deputy-director-general</a>	X		EU-UE
<a href="https://www.inrae.fr/en/news/patrick-flammarion">https://www.inrae.fr/en/news/patrick-flammarion</a>	X	Fr	dpt/unit/team
<a href="http://www.dgf.org.dz/fr/">http://www.dgf.org.dz/fr/</a>		F/Ar	govern/agency
<a href="http://www.agriculture.tn/fr/">http://www.agriculture.tn/fr/</a> (almost only arabic; better see <a href="http://www.agridata.tn/">http://www.agridata.tn/</a> )		Ar	govern/agency
<a href="https://commission.europa.eu/about-european-commission/departments-and-executive-agencies/international-partnerships_en">https://commission.europa.eu/about-european-commission/departments-and-executive-agencies/international-partnerships_en</a>	X		EU-UE
<a href="http://www.dgip.go.id/">http://www.dgip.go.id/</a>			govern/agency
<a href="https://www.agriculture.gov.ma/fr/">https://www.agriculture.gov.ma/fr/</a> or <a href="https://www.worldbank.org/en/country/morocco/brief/world-bank-involvement-in-the-agricultural-sector-in-morocco">https://www.worldbank.org/en/country/morocco/brief/world-bank-involvement-in-the-agricultural-sector-in-morocco</a>	X	Fr/Ar	govern/agency
<a href="https://www.inserm.fr/dossier/myopathie-duchenne/">https://www.inserm.fr/dossier/myopathie-duchenne/</a>		F/Ar	general
<a href="http://fr.madr.gov.dz/agriculture/protection-des-vegetaux-et-controle-technique/missions-et-organisation/">http://fr.madr.gov.dz/agriculture/protection-des-vegetaux-et-controle-technique/missions-et-organisation/</a>		Fr/Ar	govern/agency
<a href="https://www.dtu.dk/english/">https://www.dtu.dk/english/</a>	X		acad./sciences
<a href="https://www.inrae.fr/en/collaborate/expertise-and-support-public-policies">https://www.inrae.fr/en/collaborate/expertise-and-support-public-policies</a>	X	Fr	acad./sciences
<a href="https://www.anses.fr/en/content/total-diet-studies-tdss">https://www.anses.fr/en/content/total-diet-studies-tdss</a>	X	Fr	project/program.
<a href="https://www.eawaq.ch/en/">https://www.eawaq.ch/en/</a>	X		acad./sciences
<a href="https://www.edc.cm/index.php/2019/04/30/convention-banquemondiale-edc/">https://www.edc.cm/index.php/2019/04/30/convention-banquemondiale-edc/</a>			sociopro
<a href="https://www.eea.europa.eu/">https://www.eea.europa.eu/</a>	X		EU-UE
<a href="https://unece.org/environmental-monitoring">https://unece.org/environmental-monitoring</a>	X		multilateral
<a href="https://www.enameknes.ac.ma/">https://www.enameknes.ac.ma/</a>			acad./sciences
<a href="https://efficiencyforaccess.org/electric-pressure-cookers">https://efficiencyforaccess.org/electric-pressure-cookers</a>	X		general
<a href="https://www.youtube.com/watch?v=9PCIRbDM18Q">https://www.youtube.com/watch?v=9PCIRbDM18Q</a>	x	VFSTEN	dpt/unit/team
<a href="https://www.ansd.sn/sites/default/files/2023-05/RAP-rapport%20de%20resultats%20EPSF%20I.pdf">https://www.ansd.sn/sites/default/files/2023-05/RAP-rapport%20de%20resultats%20EPSF%20I.pdf</a>	X		project/program.
<a href="https://ieep.eu/european-sustainable-agriculture-dialogue/">https://ieep.eu/european-sustainable-agriculture-dialogue/</a>	X		EU-UE
<a href="https://ethz.ch/en.html">https://ethz.ch/en.html</a>	X		acad./sciences
<a href="https://agriculture.ec.europa.eu/data-and-analysis/farm-structures-and-economics/fadn_en">https://agriculture.ec.europa.eu/data-and-analysis/farm-structures-and-economics/fadn_en</a>	X		EU-UE
<a href="https://www.standardsfacility.org/">https://www.standardsfacility.org/</a>	X		govern/agency
<a href="http://www.fao.org/home/">http://www.fao.org/home/</a>	X		multilateral
<a href="https://www.gov.uk/government/organisations/foreign-commonwealth-development-office">https://www.gov.uk/government/organisations/foreign-commonwealth-development-office</a>	X		funding
<a href="https://www.ffem.fr/en">https://www.ffem.fr/en</a>	X	Fr	funding
<a href="https://fundinnovation.dev/en">https://fundinnovation.dev/en</a>	X		funding
<a href="https://www.ifad.org/en/">https://www.ifad.org/en/</a>	X		funding
<a href="https://fimabio.com/en/">https://fimabio.com/en/</a>	X		multilateral
<a href="https://www.afd.fr/en/financing-ngo-projects">https://www.afd.fr/en/financing-ngo-projects</a>	X	Fr	funding
<a href="https://www.fwo.be/en/">https://www.fwo.be/en/</a>	X	NL	funding
<a href="https://www.academia.edu/1389194/Les_Groupements_de_d%C3%A9veloppement_agricole_GDA_entrepreneurs_locaux_ou_relais_administratifs">https://www.academia.edu/1389194/Les_Groupements_de_d%C3%A9veloppement_agricole_GDA_entrepreneurs_locaux_ou_relais_administratifs</a>		Fr	project/program.
<a href="https://climate-pact.europa.eu/resources/climate-policy/ghg-protocol_en">https://climate-pact.europa.eu/resources/climate-policy/ghg-protocol_en</a>	X		general
<a href="http://www.gfdr.org/">http://www.gfdr.org/</a>	X		funding
<a href="https://edi.opml.co.uk/research/forest-governance-nepal-centralized-control-local-users-cooperatives/">https://edi.opml.co.uk/research/forest-governance-nepal-centralized-control-local-users-cooperatives/</a>	X		govern/agency
<a href="https://www.grida.no/resources/12806">https://www.grida.no/resources/12806</a>	X		govern/agency
<a href="https://ec.europa.eu/newsroom/rtd/newsletter-archives/36223">https://ec.europa.eu/newsroom/rtd/newsletter-archives/36223</a>	X		EU-UE
<a href="https://unesdoc.unesco.org/ark:/48223/pf0000235217_eng">https://unesdoc.unesco.org/ark:/48223/pf0000235217_eng</a>	X		multilateral
<a href="https://hydrohub.wmo.int/en/world-hydrological-cycle-observing-system-whykos/">https://hydrohub.wmo.int/en/world-hydrological-cycle-observing-system-whykos/</a>	X		multilateral
<a href="https://iav.ac.ma/">https://iav.ac.ma/</a>		Fr/Ar	acad./sciences
<a href="https://www.workinagriculture.com/">https://www.workinagriculture.com/</a>	X		acad./sciences
<a href="https://icimod.org/">https://icimod.org/</a>	X		acad./sciences
<a href="http://ida.worldbank.org/">http://ida.worldbank.org/</a>	X	Fr/Ar/ES...	funding
<a href="https://u-paris.fr/en/the-initiative-of-excellence-idx-label/">https://u-paris.fr/en/the-initiative-of-excellence-idx-label/</a> and <a href="https://www.inrae.fr/en/europe-and-world/fields-excellence">https://www.inrae.fr/en/europe-and-world/fields-excellence</a>	X	Fr	acad./sciences
<a href="https://idrc-crdi.ca/fr">https://idrc-crdi.ca/fr</a>	X	Fr, Es	acad./sciences
<a href="https://ieep.eu/">https://ieep.eu/</a>	X		EU-UE
<a href="https://web.jrc.ec.europa.eu/policy-model-inventory/explore/models/model-ifm-cap-print">https://web.jrc.ec.europa.eu/policy-model-inventory/explore/models/model-ifm-cap-print</a>	X		EU-UE
<a href="https://www.ifoam.bio/">https://www.ifoam.bio/</a>	X		EU-UE

English 	196 abbreviations with meaning	Region/country (or international body)	French or other 	correspondence in French and/or main language
<a href="#">IIABA</a>	Institutional Innovations for Organic Agriculture in Africa	Tanzania	<a href="#">IIABA</a>	Innovations Institutionnelles pour l'Agriculture Biologique en Afrique
<a href="#">IIAD</a>	Institutional innovations for sustainable agriculture (FAO)	FAO, Italy	<a href="#">IIAD</a>	Innovations Institutionnelles pour l'Agriculture Durable (FAO)
<a href="#">IISD</a>	International Institute for Sustainable Development	European Union	<a href="#">IISD</a>	International Institute for Sustainable Development
<a href="#">INAT</a>	National Agronomic Institute of Tunisia	Tunisia	<a href="#">INAT</a>	Institut National Agronomique de Tunisie
<a href="#">INRAA</a>	National Institute of Agronomic Research of Algeria	Algeria	<a href="#">INRAA</a>	Institut National de Recherche Agronomique d'Algérie
<a href="#">INRAB</a>	Institut National de Recherche Agronomique du Benin	Benin	<a href="#">INRAB</a>	Institut National de Recherche Agronomique du Bénin
<a href="#">INRGREF</a>	National research Institute of Rural Engineering, Water and Forests	Tunisia	<a href="#">INRGREF</a>	Institut National de la Recherche en Génie Rural, Eaux & Forêts (Tunisie)
<a href="#">IPI</a>	Swiss Federal Institute of Intellectual Property	Switzerland	<a href="#">IGE</a>	Eidgenössische Institut für Geistiges Eigentum / Institut fédéral de Propriété Intellectuelle
<a href="#">IRD</a>	French National Research Institute for Sustainable Development	France	<a href="#">IRD</a>	Institut de Recherche pour le Développement
<a href="#">IRDC</a>	International Development Research Center	Ottawa, Canada	<a href="#">CRDI</a>	Centre de recherches pour le développement international
<a href="#">ISIP</a>	Indonesian-Swiss Intellectual Property Project Indonesia/Switzerland	Indonesia/Switzerland	<a href="#">ISIP</a>	Indonesian-Swiss Intellectual Property Project Indonesia
<a href="#">ISL</a>	ISL (Freddy <u>I</u> sambert, Michel <u>S</u> alembier et Michel <u>L</u> ino) Ingénierie, France	France	<a href="#">ISL</a>	ISL (Freddy <u>I</u> sambert, Michel <u>S</u> alembier et Michel <u>L</u> ino) Ingénierie France
<a href="#">ISRA</a>	Senegalese Agricultural Research Institute	Senegal	<a href="#">ISRA</a>	Institut Sénégalais de Recherches Agricoles Senegal
<a href="#">ITA</a>	Institute (laboratory) of Food Technology (WATHI)	Senegal	<a href="#">ITA</a>	Institut (laboratoire) de Technologie Alimentaire (WATHI, Sénégal)
<a href="#">IUAF</a>	International Union for AgroForestry	Czech Republic	<a href="#">IUAF</a>	International Union for AgroForestry
<a href="#">IWG</a>	Institute for Water & Environment* (integrated into KIT)*	Germany	<a href="#">IWG</a>	Institut pour l'eau et l'environnement* (désormais intégré au KIT)*
<a href="#">IWMI</a>	International Water Management Institute	Sri Lanka	<a href="#">IWMI</a>	International Water Management Institute
<a href="#">IWRM</a>	Integrated Water Resources Management (Sweden)	UNO-ONU	<a href="#">GIRE</a>	Gestion Intégrée des Ressources en Eau (Suède)
<a href="#">JRC</a>	Joint Research Centre	European Union	<a href="#">CCR</a>	Centre Commun de Recherche
<a href="#">LabEx</a>	Laboratory of Excellence (cf. PIA)	France	<a href="#">LabEx</a>	Laboratoire d'Excellence (cf. PIA)
<a href="#">LCSSA</a>	Central Laboratory of Food Safety Control (incorporated by ABSSA)	Benin	<a href="#">LCSSA</a>	Lab. Central - Contrôle Sécurité Sanitaire des Aliments (dans l'ABSSA)
<a href="#">LEB</a>	Laboratory of Ecology, Botany and Plant Biology, university of Parakou	Benin	<a href="#">LEB</a>	Laboratoire d'Écologie, Botanique et Biologie Végétale (univ. Parakou)
<a href="#">LISIS</a>	Interdisciplinary Laboratory for Science, Innovation and Society (INRAE)	(INRAE) France	<a href="#">LISIS</a>	Laboratoire Interdisciplinaire Sciences Innovations Sociétés (INRAE)
<a href="#">MAA</a>	Agrobiosciences Mission [CoDIR, (INRAE)]	(INRAE) France	<a href="#">MAA</a>	Mission Agro-biosciences (CoDIR, INRAE)
<a href="#">MADR</a>	Ministry of Agriculture and Rural Development (Algeria)	Algeria	<a href="#">MADR</a>	Ministère de l'Agriculture et du Développement Rural (Algérie)
<a href="#">MAPDEF</a>	Ministry of Agriculture, maritime fisheries, rural develop., water and forests	Morocco	<a href="#">MAPDEF</a>	Ministère Agriculture, Pêche maritime, Développ. rural et Eaux & Forêts
<a href="#">MARHP</a>	Ministry of Agriculture, Water Resources and Fisheries (Tunisia)	Tunisia	<a href="#">MARHP</a>	Ministère de l'Agriculture, des Ressources Hydrauliques et de la Pêche
<a href="#">MASSIRE</a>	Maghreb – Innovation systems – Water Resources	(INRAE) France	<a href="#">MASSIRE</a>	Maghreb – SyStèmes d'Innovation – Ressources en Eau Maghreb
<a href="#">Metabio</a>	Métaprogramme Bio (INRAE)	(INRAE) France	<a href="#">Metabio</a>	Métaprogramme Bio (INRAE)
<a href="#">MGPS</a>	MetaGenoPolis (INRAE)	(INRAE) France	<a href="#">MGPS</a>	MetaGenoPolis (INRAE)
<a href="#">MIDAS</a>	Modelling Inventory and Knowledge Management System	European Union	<a href="#">MIDAS</a>	Modelling Inventory and Knowledge Management System
<a href="#">MINEE</a>	Ministry of Water Resources and Energy (Cameroon)	Cameroon	<a href="#">MINEE</a>	Ministère de de l'Eau et de l'Énergie Cameroon
<a href="#">MiPAAFI</a>	Ministry of agriculture, food sovereignty and forestry (now MASAF, Italy)	Italy	<a href="#">MiPAAFI</a>	Ministero dell'agricoltura, della sovranità alimentare e delle foreste (auj. MASAF)
<a href="#">MoISA</a>	Montpellier Interdisciplinary center on Sustainable Agri-food systems [nutritional/HSS]	(INRAE) France	<a href="#">MoISA</a>	Montpellier Interdisciplinary center on Sustainable Agri-food systems
<a href="#">MRC</a>	Mekong River Commission	South Asia, Mekong river	<a href="#">MRC</a>	Commission du fleuve Mékong Asie sud-est (bassin du Mékong)
<a href="#">MRV</a>	Measurement, Reporting and Verification (methods: AFD project)	(AFD, France)	<a href="#">MRV</a>	Measurement, Reporting and Verification (methods: AFD project)
<a href="#">NAFDAC</a>	National Agency for Food and Drug Administration and Control (Nigeria)	Nigeria	<a href="#">NAFDAC</a>	National Agency for Food and Drug Administration and Control (Nigeria)
<a href="#">NASA</a>	National Aeronautics & Space Administration	USA	<a href="#">NASA</a>	National Aeronautics & Space Administration
<a href="#">NBA</a>	Niger Basin Authority	Niger	<a href="#">ABN</a>	Autorité du Bassin du Niger
<a href="#">NEPAD</a>	New Partnership for Africa's Development (AUDA)	Africa	<a href="#">NEPAD</a>	New Partnership for Africa's Development (AUDA)
<a href="#">NOGAMU</a>	National Organic Agricultural Movement of Uganda	Uganda	<a href="#">NOGAMU</a>	Mouvement national pour l'Agriculture biologique d'Ouganda
<a href="#">NUTS- (x)</a>	Common classification of territorial units for statistics (Eurostats)	European Union	<a href="#">NUTS- (x)</a>	Nomenclature des Unités Territoriales Statistiques (Eurostats)
<a href="#">OECD</a>	Organisation for Economic Co-operation and Development	France	<a href="#">OCDE</a>	Organisation de Coopération & Développement Économiques
<a href="#">OIEau</a>	International Office for Water	France	<a href="#">OIEau</a>	Office International de l'Eau
<a href="#">OKACOM</a>	Okavango River Basin Water Commission	Angola, Botswana, Namibia	<a href="#">OKACOM</a>	Okavango River Basin Water Commission
<a href="#">OKACOM</a>	Okavango River Basin Water Commission	Angola, Botswana, Namibia	<a href="#">OKACOM</a>	Okavango River Basin Water Commission
<a href="#">OMVS</a>	Senegal River Basin Development Authority	Senegal	<a href="#">OMVS</a>	Organisation pour la Mise en Valeur du fleuve Sénégal
<a href="#">ONAS</a>	National Office for Sanitation	Tunisia	<a href="#">ONAS</a>	Office National de l'Assainissement
<a href="#">ORI</a>	Okavango Research Institute (UB)	Angola, Botswana, Namibia	<a href="#">ORI</a>	Okavango Research Institute (UB)
<a href="#">ORMVA</a>	Regional Agricultural Development Office (Tafilalt region)	Morocco	<a href="#">ORMVA</a>	Office Régional de Mise en Valeur Agricole (région de Tafilalet)

\* (obsolete) KIT: Karlsruhe Institute of Technology

195 indications Web links	English	other or / main language	type
<a href="https://umr-moisa.cirad.fr/en/-unite/projets-de-recherche/projets-acheves/public-projet-iiaba">https://umr-moisa.cirad.fr/en/-unite/projets-de-recherche/projets-acheves/public-projet-iiaba</a>			
<a href="https://www.fao.org/family-farming/detail/en/c/472555/">https://www.fao.org/family-farming/detail/en/c/472555/</a>	X		multilateral
<a href="https://www.iisd.org/">https://www.iisd.org/</a>	X		acad./sciences
<a href="http://www.inat.tn/fr">http://www.inat.tn/fr</a>	X	Fr/Ar	acad./sciences
<a href="https://inraa.dz/">https://inraa.dz/</a> or <a href="https://inra-algerie.blogspot.com/">https://inra-algerie.blogspot.com/</a> or <a href="http://dalile-infra.dgrsd.dz/infrastructure/centres/institut-national-de-la-recherche-agronomique-dalgerie/">http://dalile-infra.dgrsd.dz/infrastructure/centres/institut-national-de-la-recherche-agronomique-dalgerie/</a>		Fr/Ar	acad./sciences
<a href="https://inrab.bj/">https://inrab.bj/</a>		Fr	acad./sciences
<a href="http://www.inrgref.agrinet.tn/en/">http://www.inrgref.agrinet.tn/en/</a>	X	Fr/Ar	acad./sciences
<a href="https://www.iqe.ch/en/">https://www.iqe.ch/en/</a>	X	Fr/Del/Rm	governt/agency
<a href="https://en.ird.fr/">https://en.ird.fr/</a>	X	Fr	acad./sciences
<a href="https://idrc-crdi.ca/en">https://idrc-crdi.ca/en</a>	X		acad./sciences
<a href="https://www.swisscontact.org/en/projects/isip">https://www.swisscontact.org/en/projects/isip</a>	X		governt/agency
<a href="https://www.isl.fr/">https://www.isl.fr/</a>		Fr	sociopro
<a href="https://isra.sn/">https://isra.sn/</a>			acad./sciences
<a href="https://ita.sn/laboratoires/">https://ita.sn/laboratoires/</a>	X		acad./sciences
<a href="https://iuaf.org/">https://iuaf.org/</a>	X		multilateral
<a href="https://www.iwu.kit.edu/wg/english/index.php">https://www.iwu.kit.edu/wg/english/index.php</a>	X		acad./sciences
<a href="http://www.iwmi.cgiar.org/">http://www.iwmi.cgiar.org/</a>	X		acad./sciences
<a href="https://www.unep.org/topics/fresh-water/water-resources-management/integrated-water-resources-management">https://www.unep.org/topics/fresh-water/water-resources-management/integrated-water-resources-management</a>	X	Fr	UNO-ONU
<a href="https://joint-research-centre.ec.europa.eu/jrc-sites-across-europe/jrc-brussels-belgium_en">https://joint-research-centre.ec.europa.eu/jrc-sites-across-europe/jrc-brussels-belgium_en</a>	X	(EU)	EU-UE
<a href="https://u-paris.fr/en/laboratories-of-excellence/">https://u-paris.fr/en/laboratories-of-excellence/</a> and <a href="https://www.inrae.fr/en/europe-and-world/fields-excellence">https://www.inrae.fr/en/europe-and-world/fields-excellence</a>	X	Fr	acad./sciences
<a href="https://agriculture.gouv.bi/abssa/index.php/layout-options/historique-vision">https://agriculture.gouv.bi/abssa/index.php/layout-options/historique-vision</a>		Fr	governt/agency
<a href="https://leb-up.org/">https://leb-up.org/</a>		Fr	acad./sciences
<a href="https://www.wathi.org/invite-les-consommateurs-a-venir-vers-la-recherche-fanta-quindo-ingenieure-technologue/">https://www.wathi.org/invite-les-consommateurs-a-venir-vers-la-recherche-fanta-quindo-ingenieure-technologue/</a>	X		acad./sciences
<a href="https://www.agrobiosciences.org/la-mission-agrobiosciences-inrae/article/presentation-de-la-maa-inrae">https://www.agrobiosciences.org/la-mission-agrobiosciences-inrae/article/presentation-de-la-maa-inrae</a>		Fr	acad./sciences
<a href="http://fr.madr.gov.dz/">http://fr.madr.gov.dz/</a>		Fr/Ar	governt/agency
<a href="https://www.agriculture.gov.ma/fr">https://www.agriculture.gov.ma/fr</a>		Fr/Ar	governt/agency
<a href="http://www.agriculture.tn/fr/">http://www.agriculture.tn/fr/</a> (almost only arabic; better see <a href="http://www.agridata.tn/">http://www.agridata.tn/</a> )		Ar.	governt/agency
<a href="https://en.massire.net/">https://en.massire.net/</a>	X	Ar	multilateral
<a href="https://eng-metabio.hub.inrae.fr/">https://eng-metabio.hub.inrae.fr/</a>	X	Fr	acad./sciences
<a href="https://mgps.eu/">https://mgps.eu/</a>	X	Fr	acad./sciences
<a href="https://web.jrc.ec.europa.eu/policy-model-inventory/">https://web.jrc.ec.europa.eu/policy-model-inventory/</a>	X		EU-UE
<a href="http://www.minee.cm/">http://www.minee.cm/</a>	X	Fr	governt/agency
<a href="https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/202">https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/202</a>		It	governt/agency
<a href="https://umr-moisa.cirad.fr/en">https://umr-moisa.cirad.fr/en</a>	X	Fr	acad./sciences
<a href="http://www.mrcmekong.org/about-mrc">http://www.mrcmekong.org/about-mrc</a>	X		multilateral
<a href="https://www.worldbank.org/en/news/feature/2022/07/27/what-you-need-to-know-about-the-measurement-reporting-and-verification-mrv-of-carbon-credits">https://www.worldbank.org/en/news/feature/2022/07/27/what-you-need-to-know-about-the-measurement-reporting-and-verification-mrv-of-carbon-credits</a>	X	Fr	project/program.
<a href="https://www.nafdac.gov.ng/">https://www.nafdac.gov.ng/</a>	X		governt/agency
<a href="https://www.nasa.gov/">https://www.nasa.gov/</a>	X		governt/agency
<a href="http://www.abn.ne/index.php?lang=en">http://www.abn.ne/index.php?lang=en</a>	X	Fr	multilateral
<a href="https://www.nepad.org/who-we-are#about_us">https://www.nepad.org/who-we-are#about_us</a>	X		multilateral
<a href="https://nogamu.org/">https://nogamu.org/</a>	X		multilateral
<a href="https://ec.europa.eu/eurostat/fr/web/nuts/background">https://ec.europa.eu/eurostat/fr/web/nuts/background</a> or <a href="https://www.eea.europa.eu/data-and-maps/data/external/utilized-agricultural-area-of-specific">https://www.eea.europa.eu/data-and-maps/data/external/utilized-agricultural-area-of-specific</a>	X	Fr	EU-UE
<a href="https://www.oecd.org/">https://www.oecd.org/</a>	X	Fr	funding
<a href="https://www.oieau.fr/eaudoc/notice/Groupe-de-travail-sur-lhydrologie-spatiale-Programme-swot">https://www.oieau.fr/eaudoc/notice/Groupe-de-travail-sur-lhydrologie-spatiale-Programme-swot</a>		Fr	multilateral
<a href="https://www.okacom.org/">https://www.okacom.org/</a>	X		multilateral
<a href="https://www.omvs.org/">https://www.omvs.org/</a>		Fr	multilateral
<a href="http://www.onas.nat.tn/Fr/index.php?code=3">http://www.onas.nat.tn/Fr/index.php?code=3</a>		Fr/Ar	governt/agency
<a href="https://www.ori.ub.bw/">https://www.ori.ub.bw/</a>	X		acad./sciences
<a href="https://www.ormvatafilalet.ma/">https://www.ormvatafilalet.ma/</a>		Fr/Ar	governt/agency

 English <i>196 abbreviations with meaning</i>		Region/country (or international body)	 French <i>or other</i>	correspondence in French and/or main language
<a href="#">P3A</a>	Support Program to the Implementation of the Association Agreement	EU (Twinning)	<a href="#">P3A</a>	Programme d'Appui à la mise en œuvre de l'Accord d'Association
<a href="#">PATDHS</a>	Hydropower Development on Sanaga River Technical Assistance Project	Cameroon	<a href="#">PATDHS</a>	Projet d'Assistance Technique Développement Hydroélectrique sur le Sanaga
<a href="#">PEDL</a>	Private Enterprise Development in Low Income Countries (cf. CEPR)	general	<a href="#">PEDL</a>	Private Enterprise Development in Low Income Countries (cf. CEPR)
<a href="#">PIA</a>	French Investments for the Future Programme	France	<a href="#">PIA</a>	Programme d'Investissement pour l'Avenir (France)
<a href="#">PNVi</a>	Virunga National Park	Democ. Rep. Congo	<a href="#">PNVi</a>	Parc National des Virunga
<a href="#">pS-Eau</a>	Water Solidarity Programme	France	<a href="#">pS-Eau</a>	programme Solidarité-Eau (France)
<a href="#">RASMI</a>	Gathering of Mitsamiouliens	Comores	<a href="#">RASMI</a>	Rassemblement des Mitsamiouliens
<a href="#">REUSE/REUT</a>	Waste water reclamation / sewage and sewerage	general	<a href="#">REUSE/REUT</a>	Réutilisation des Eaux Usées / Réutilisation des Eaux Usées Traitées
<a href="#">RMC</a>	Rhone Mediterranean Corsica – Water Agency (id. AE-RMC or AERMC)	Corsica, France	<a href="#">RMC</a>	Agence de l'Eau – Rhône-Méditerranée, Corse (id. AE-RMC ou AERMC)
<a href="#">SAFE-M</a>	Supporting learning and training on water in Madagascar	Madagascar	<a href="#">SAFE-M</a>	Soutenir l'Apprentissage et les Formations sur l'Eau à Madagascar
<a href="#">SANDEE</a>	South Asian Network for Development & Environmental Economics	(ICIMOD)Nepal	<a href="#">SANDEE</a>	South Asian Network for Development & Environmental Economics
<a href="#">SAVi</a>	Sustainable Asset Valuation (IISD)	Canada	<a href="#">SAVi</a>	Sustainable Asset Valuation (IISD) Canada
<a href="#">SCP</a>	Société du Canal de Provence (water services of Provence)	France	<a href="#">SCP</a>	Société du Canal de Provence
<a href="#">SDGs</a>	Sustainable Development Goals	international	<a href="#">ODD</a>	Objectifs de Développement Durable
<a href="#">SECO</a>	State Secretariat for Economic Affairs	Switzerland	<a href="#">SECO</a>	Secrétariat d'État à l'économie suisse Switzerland
<a href="#">SEEN</a>	Experimentation, Testing and Standardisation Department	Morocco	<a href="#">SEEN</a>	Service Expérimentations, Essais et Normalisation (DIAEA)
<a href="#">SEM</a>	Alsace Moselle Water and Sanitation Syndicate	France	<a href="#">SEM</a>	Société des Eaux de Marseille (métropole)
<a href="#">SFSC</a>	Short Food Supply Chain (EUFIC)	European Union	<a href="#">SFSC</a>	Short Food Supply Chain (EUFIC)
<a href="#">SIDA</a>	Swedish International Development cooperation Agency Sweden	Sweden	<a href="#">SIDA</a>	Styrelsen för internationellt utvecklingsarbete
<a href="#">STEP</a>	cf. sWWTP Waste Water Treatment Plant (REUSE/REUT programmes)	general	<a href="#">STEP</a>	STation d'Épuration des eaux usées (plusieurs programmes REUSE/REUT)
<a href="#">STEP</a>	WWTP phytopurification project in Comoros (REUSE/REUT)		<a href="#">STEP</a>	STation d'Épuration des eaux usées (REUSE/REUT)
<a href="#">STICS</a>	multidisciplinary simulator for standard crops (agro-ecosystem analysis: generic soil modelling)	(INRAE) France	<a href="#">STICS</a>	Simulateur multidisciplinaire pour les Cultures Standard
<a href="#">STISA</a>	Science, Technology and Innovation Strategy for Africa	Africa	<a href="#">STISA</a>	Stratégie de la Science, de la Technologie et de l'Innovation pour l'Afrique
<a href="#">SWOT</a>	Surface Water and Ocean Topography	general	<a href="#">SWOT</a>	Surface Water and Ocean Topography
<a href="#">IDS / TSD</a>	Temporal Dominance of Sensations / Temporal Sensations Dominance	general	<a href="#">DTS</a>	Dominance Temporelle des Sensations
<a href="#">IDS</a>	Total Diet Study / Études Alimentation Total (EAT) Africa sub-Saharan	general	<a href="#">EAT</a>	Études Alimentation Total en Afrique sub-Saharienne (TDS)
<a href="#">TOAM</a>	Tanzania Organic Agriculture Movement (Kilimohai)	Tanzania	<a href="#">TOAM</a>	Tanzania Organic Agriculture Movement (Kilimohai)
<a href="#">ToR</a>	Terms of Reference	general	<a href="#">ToR / TdR</a>	Terms of Reference / Termes de référence
<a href="#">TSARA</a>	Transforming food system and agriculture par une Recherche with Africa	Africa	<a href="#">TSARA</a>	Transformer Systèmes Agro-alimentaires par une Recherche avec l'Afrique
<a href="#">TSI</a>	Temporal Sensory Innovation	general	<a href="#">TSI</a>	Temporal Sensory Innovation
<a href="#">UAN</a>	University Agostinho Neto (Luanda – Angola)	Angola	<a href="#">UAN</a>	Universidade Agostinho Neto (Luanda – Angola)
<a href="#">UB</a>	University of Botswana	Botswana	<a href="#">UB</a>	University of Botswana
<a href="#">UGP</a>	Program/Project management unit	Africa ( <i>more specific.</i> )	<a href="#">UGP</a>	Unité de Gestion de Programme/Projet
<a href="#">UNAM</a>	University of Namibia (Windhoek – Namibia)	Namibia	<a href="#">UNAM</a>	University of Namibia (Windhoek – Namibia)
<a href="#">UNDP</a>	United Nations Development Programme	UNO-ONU	<a href="#">PNUD</a>	Programme des Nations Unies pour le Développement
<a href="#">UNEP</a>	United Nations Environment Programme	UNO-ONU	<a href="#">PNUE</a>	Programme des Nations Unies pour l'Environnement
<a href="#">UNO</a>	United Nations Organization	UNO-ONU	<a href="#">ONU</a>	Organisation des Nations Unies
<a href="#">UNPAD</a>	Universitas Padjadjaran (Indonesia)	Indonesia	<a href="#">UNPAD</a>	Universitas Padjadjaran Indonesia
<a href="#">UUA</a>	Utilised Agricultural Area	European Union	<a href="#">SAU</a>	Surface Agricole Utilisée
<a href="#">VAF</a>	VikasAnvesh Foundation (Tata Trust)	India	<a href="#">VAF</a>	VikasAnvesh Foundation
<a href="#">WaSAF</a>	Water Sources in Africa	Africa	<a href="#">WaSAF</a>	Water Sources in Africa
<a href="#">WB</a>	World Bank	USA	<a href="#">BM</a>	Banque Mondiale / World Bank
<a href="#">WHYCOS</a>	World HYdrological Cycle Observation System	USA / Switzerland	<a href="#">WHYCOS</a>	World HYdrological Cycle Observation System
<a href="#">WMO</a>	World Meteorological Organization	Switzerland	<a href="#">OMM</a>	Organisation Météorologique Mondiale
<a href="#">WWF</a>	World Water Forum	France	<a href="#">FME</a>	Forum Mondial de l'Eau
<a href="#">WWTP</a>	WasteWater Treatment Plant (renovation using constructed wetlands)	general	<a href="#">FPV</a>	Filtres Plantés de Végétaux (REUT/REUSE)

Web links 195 indications	Main languages	type
<a href="https://www.p3a-algerie.org/">https://www.p3a-algerie.org/</a> (over) cf. <a href="https://www.aps.dz/algerie/146610-algerie-ue-cloture-d-un-jumelage-institutionnel-au-profit-de-la-direction-generale-des-forets">https://www.aps.dz/algerie/146610-algerie-ue-cloture-d-un-jumelage-institutionnel-au-profit-de-la-direction-generale-des-forets</a>	FR	EU-UE
<a href="https://armp.cm/details?type_publication=AMI&amp;id_publication=2657">https://armp.cm/details?type_publication=AMI&amp;id_publication=2657</a>	X Fr	project/program.
<a href="https://pedl.cepr.org/">https://pedl.cepr.org/</a>	X	funding
<a href="https://swot.cnes.fr/fr/swot/en-detail/applications">https://swot.cnes.fr/fr/swot/en-detail/applications</a>	X Fr	UNO-ONU
<a href="https://virunga.org/">https://virunga.org/</a>	X Fr	govemt/agency
<a href="https://www.pseau.org/">https://www.pseau.org/</a>	Fr	project/program.
<a href="http://www.rasmi.fr/">http://www.rasmi.fr/</a> (broken link)	Fr	association
<a href="https://eng-reversaal.lyon-grenoble.hub.inrae.fr/projects/reuse">https://eng-reversaal.lyon-grenoble.hub.inrae.fr/projects/reuse</a>	X Fr	general
<a href="https://www.eaurmc.fr/">https://www.eaurmc.fr/</a>	Fr	govemt/agency
<a href="https://morpho.ipgp.fr/safe-m/?page_id=41">https://morpho.ipgp.fr/safe-m/?page_id=41</a>	Fr	project/program.
<a href="http://www.sandeeonline.org/">http://www.sandeeonline.org/</a>	X	multilateral
<a href="https://www.iisd.org/projects/sustainable-asset-valuation-savi">https://www.iisd.org/projects/sustainable-asset-valuation-savi</a>	X Fr	govemt/agency
<a href="https://canaldeprovence.com/">https://canaldeprovence.com/</a>	Fr	sociopro
<a href="https://sdgs.un.org/goals">https://sdgs.un.org/goals</a>	X Fr, ...	general
<a href="https://www.seco.admin.ch/seco/fr/home.html">https://www.seco.admin.ch/seco/fr/home.html</a>	X Fr/De/It	govemt/agency
<a href="https://www.seco-cooperation.admin.ch/secocoop/fr/home.html">https://www.seco-cooperation.admin.ch/secocoop/fr/home.html</a>	X Fr/De/It	govemt/agency
(broken links; cf. <a href="http://www.mpm.gov.ma/">http://www.mpm.gov.ma/</a> [in French])	Fr/Ar	govemt/agency
<a href="https://www.eaudemarseille-metropole.fr/">https://www.eaudemarseille-metropole.fr/</a>	Fr	sociopro
<a href="https://www.eufic.org/en/food-production/article/short-food-supply-chains-reconnecting-producers-and-consumers/">https://www.eufic.org/en/food-production/article/short-food-supply-chains-reconnecting-producers-and-consumers/</a>	X Fr/De/It/Es	EU-UE
<a href="https://www.sida.se/en">https://www.sida.se/en</a>	X	govemt/agency
<a href="https://www.inrae.fr/actualites/epuration-eaux-usees-traiter-bon-escient">https://www.inrae.fr/actualites/epuration-eaux-usees-traiter-bon-escient</a>	Fr	general
<a href="https://www.siaap.fr/international/cooperation-decentralisee/asie/vietnam-hai-duong/">https://www.siaap.fr/international/cooperation-decentralisee/asie/vietnam-hai-duong/</a>	X Fr	project/program.
<a href="https://www6.paca.inrae.fr/stics/Qui-sommes-nous/Presentation-du-modele-Stics">https://www6.paca.inrae.fr/stics/Qui-sommes-nous/Presentation-du-modele-Stics</a>	X Fr	project/program.
<a href="https://stics.inrae.fr/eng/about-us/stics-model-overview">https://stics.inrae.fr/eng/about-us/stics-model-overview</a>	X Fr	multilateral
<a href="https://swot.jpl.nasa.gov/">https://swot.jpl.nasa.gov/</a> (EN) and (FR) <a href="https://cnes.fr/projets/swot">https://cnes.fr/projets/swot</a>	X Fr	multilateral
<a href="https://www.sciencedirect.com/science/article/abs/pii/S2214799317300309">https://www.sciencedirect.com/science/article/abs/pii/S2214799317300309</a>	X	general
<a href="https://www.anses.fr/en/content/total-diet-studies-tdss">https://www.anses.fr/en/content/total-diet-studies-tdss</a>	X Fr	project/program.
<a href="https://www.kilimohai.org/">https://www.kilimohai.org/</a>	X	multilateral
<a href="https://documents1.worldbank.org/curated/en/209341599772583527/pdf/Writing-Terms-of-Reference-for-an-Evaluation-A-How-to-Guide.pdf">https://documents1.worldbank.org/curated/en/209341599772583527/pdf/Writing-Terms-of-Reference-for-an-Evaluation-A-How-to-Guide.pdf</a>	X	administration
<a href="https://www.inrae.fr/en/news/african-and-french-institutions-partner-through-tsara-research-plan-food-and-agricultural-systems">https://www.inrae.fr/en/news/african-and-french-institutions-partner-through-tsara-research-plan-food-and-agricultural-systems</a>	X Fr	acad./sciences
(software; ceased operating)		project/program.
<a href="https://www.uan.ao/">https://www.uan.ao/</a>	Pt	acad./sciences
<a href="https://www.ub.bw/">https://www.ub.bw/</a>	X	acad./sciences
<a href="https://aidspan.org/?action=catalog_singlepost&amp;id=11130">https://aidspan.org/?action=catalog_singlepost&amp;id=11130</a> (and French: <a href="https://aidspan.org/?action=catalog_singlepost&amp;id=16164">https://aidspan.org/?action=catalog_singlepost&amp;id=16164</a> )	X Frr	project/program.
<a href="https://aidspan.org/?action=catalog_singlepost&amp;id=16164">https://aidspan.org/?action=catalog_singlepost&amp;id=16164</a>	X	governance
<a href="https://www.unam.edu.na/about-unam">https://www.unam.edu.na/about-unam</a>	X	acad./sciences
<a href="https://www.undp.org/">https://www.undp.org/</a>	X Fr/ES	UNO-ONU
<a href="https://www.unenvironment.org/">https://www.unenvironment.org/</a>	X multi	UNO-ONU
<a href="https://www.un.org/en">https://www.un.org/en</a>	X Fr/Es, ...	UNO-ONU
<a href="https://www.unpad.ac.id/en/">https://www.unpad.ac.id/en/</a>	X	acad./sciences
<a href="https://www.eea.europa.eu/data-and-maps/data/external/utilized-agricultural-area-of-specific">https://www.eea.europa.eu/data-and-maps/data/external/utilized-agricultural-area-of-specific</a>	X	EU-UE
<a href="https://www.vikasanvesh.in/">https://www.vikasanvesh.in/</a>	X In.	acad./sciences
<a href="https://www.inrae.fr/en/news/wasaf-protecting-surface-freshwater-sources-africa">https://www.inrae.fr/en/news/wasaf-protecting-surface-freshwater-sources-africa</a>	X Fr	project/program.
<a href="https://www.worldbank.org/en/home">https://www.worldbank.org/en/home</a>	X multi	funding
<a href="https://wmo.int/site/wmo-hydrohub/focus-areas/increasing-capacity/world-hydrological-cycle-observing-system-whykos">https://wmo.int/site/wmo-hydrohub/focus-areas/increasing-capacity/world-hydrological-cycle-observing-system-whykos</a>	X multi	multilateral
<a href="https://wmo.int/">https://wmo.int/</a>	X multi	multilateral
<a href="https://www.worldwatercouncil.org/en">https://www.worldwatercouncil.org/en</a>	X Fr	project/program.
<a href="https://eng-reversaal.lyon-grenoble.hub.inrae.fr/equipment-platforms/la-feyssine">https://eng-reversaal.lyon-grenoble.hub.inrae.fr/equipment-platforms/la-feyssine</a>	X Fr	project/program.



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