

# AGRO-ECOLOGY: EVALUATION METHODS FOR ITS EFFECTS AND CONDITIONS FOR DEVELOPMENT

Proceedings of the exchange and methodological construction workshop  
on the 14<sup>th</sup> and 15<sup>th</sup> of December 2017



GRUPE DE TRAVAIL SUR LES TRANSITIONS AGROECOLOGIQUES

This document was produced  
with the support of:



## ACKNOWLEDGEMENTS

We would like to thank the following for the implementation of the workshop and the writing of proceedings:

- All the authors having produced and presented a subject: Sylvain Berton (Agrisud), Marc Moraine (ISARA), Sarah Audouin (CIRAD), Stéphane de Tourdonnet (Sup-Agro Montpellier), Laurent Levard (GRET), Michel Berhocoirigoin (Confédération Paysanne), Paola Guzman (CAWR), Cornelia Rumpel (INRA), Bertrand Mathieu (AVSF), Michael Farrelly (AFSA), Dominique Masse (IRD), Raffaele D'Annolfo (UCSC), Tomás León Sicard (SOCLA), Cathy Clermont-Dauphin (IRD), Marc Dufumier (Agroparistech), Frédéric Apollin (AVSF).
- Viviane Arnould and Chloé Delhom for providing interpretation during the workshop and translation of some of the acts.
- The various teams of the 4 GTAE organisations and in particular Marie Fortier (AVSF), responsible for the organisation, logistics and promotion of the workshop.
- Emmanuelle Poirier-Magona and Stéphanie Gaymard (AFD), for their involvement in the organising committee and the selection of presentations.
- Cathy Clermont-Dauphin (IRD) and Mélanie Requier-Desjardins (IAMM) for their enlightening contribution to the selection of communications and revision of proceedings.
- ARAA/CEDEAO to enable the implementation of CALAO project.
- AFD and FFEM for their financial support.

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### To quote this paper:

GTAE, 2018. Agroecology: evaluation methods for its effects and conditions for development. Proceedings of the exchange and methodological construction workshop. 14<sup>th</sup> and 15<sup>th</sup> of December 2017. AFD/FFEM. 52p.



Some of the 105 participants present at the workshop in Nogent-sur-Marne, on the campus of the Jardin d'Agronomie Tropicale of Paris, 14 and 15 December 2017

# **AGRO-ECOLOGY: EVALUATION METHODS FOR ITS EFFECTS AND CONDITIONS FOR DEVELOPMENT**

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# INTRODUCTION



This paper is intended to present the work carried out during the seminar held on the 14<sup>th</sup> and 15<sup>th</sup> of December 2017 by the work group on agroecological transitions (GTAE) and is devoted to the evaluation methods of agroecology.

The GTAE consists of four NGOs (Agrisud, AVSF, CARI and GRET), which support the development of agroecology in various countries around the world. Since its creation in 2016, the group has organised various exchange and training workshops in France and Burkina, became involved in reflections and contributions on the 4P1000 initiative and, together with various partners, implemented the CALAO project “*capitalisation of stakeholder experience for the development of resilient agroecological techniques in West Africa*” as part of the PASANAO (Support for Food Security in West Africa) project financed by AFD, and for which ECOWAS is the contracting authority. From past experiences and validated data, this project aimed to develop methodological tools to assess the conditions for the development of agroecology, and analyse and evaluate performances, the effects and impact of practices and agroecological systems on development and resilience. Furthermore, the aim of the project was to communicate and capitalise for policy dialogue and advocacy purposes.

With its 12 working sessions, the seminar held on the 14<sup>th</sup> and 15<sup>th</sup> of December was a key moment of the GTAE. Out of about one hundred participants from 15 different countries, 60% came from civil society organisations, 20% from the scientific sector, 5% from professional organisations, 5% from development departments, donors, etc.

According to Dalgaard et al (2003)<sup>1</sup> agroecology covers an extremely broad area of investigation which extends from areas of ethics or beliefs to the field of matter and physics. Agroecology as a concept is about a hundred years old, but in the past few years it began as an emerging scientific discipline, based on a group of practices that are sometimes deemed “outdated” or “experimental” and on a marginal socio-economic movement, mainly in Latin America, and became a political issue on local, national and global levels. Faced with increasing constraints to achieving food security, declining soil fertility, degradation of land and the ecosystems’ loss of vitality, the reduction of cultivated biodiversity and climate change affecting agricultural productivity, does agroecology offer alternatives and if so then what are they?

Different questions arise: Can agroecology restore and maintain ecosystems, lift peasant farmers out of poverty, meet the challenge of feeding the world’s population, create jobs, contribute to stabilise populations, protect the environment, enable populations to adapt and mitigate the effects of climate change? Which agroecological practices are the most efficient or effective to face these challenges and in which contexts? Is agroecology as successful as the green revolution that some actors always defend? Which systems and agroecological practices should be backed by incentives? Which conditions promote – or limit – experimentation and development of agroecological practices? The answers to these questions are important:

- for different groups of field actors (agricultural research and advice centres, NGOs, producers and producer organisations, etc.) that promote the development of agroecology, in order to improve their actions and evaluate their effects,
- for various actors seeking to promote agroecology to public authorities through strong and comparable references,
- for public authorities themselves so that they can develop and implement policies supporting sustainable and resilient practices where the development of agroecology can be part of the guidelines.

In recent years, there have been various evaluations of the effects of and conditions for agroecology development. However, these evaluations often cover a restricted spectrum of agro-ecosystems, territories and practices. They are often scattered, partial, incomplete and carried out using different methods and tools. Comparing results is difficult. This is why the GTAE wishes to move towards common methodological tools, which can be used by various actors, as well as towards common references on agroecology.

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1. Dalgaard T., Hutchings N.J., Porter J.R., 2003. Agroecology, scaling and interdisciplinarity. *Agriculture, Ecosystems & Environment*. 100 (1) 39-51.

## DESIGN AND PRINCIPLES OF AGROECOLOGY

In promoting a set of practices that are also the subject of scientific work, the agroecology movement was born from the following two-fold observation:

- on the one hand, the crisis of agrarian systems which have not been able to find alternatives to the gradual disappearance of former methods of soil use and fertility management. These methods were mainly based on long fallows or shorter fallows with a certain level of crop-livestock integration,
- on the other hand, the visible limits and environmental and social damage of the green revolution practices.

Given this situation, agroecology responds to two fundamental principles:

- on the one hand, the principle of **fully developing the ecosystems' potential**, both in terms of the capture of external resources (carbon dioxide, nitrogen, solar energy, water, and underground minerals) and in terms of process stimulation and physical, chemical and biological flows within the ecosystem (including recycling of biomass). The application of this principle meets targets related to agricultural production in terms of quantity, regularity and quality (nutritional, health and taste quality), as well as the goal to be autonomous regarding the use of inputs and external power. In turn, these goals contribute to objectives of food and nutritional security and generation of income, which are development objectives,
- on the other hand, the principle of **preservation, or even restoration, for agro-ecosystems** (including soil fertility and water availability), which addresses goals of sustainability, the provision of various benefits for the environment (biodiversity, absence of contamination, etc.), climate change adaptation and mitigation.

These principles of agroecology differentiate themselves from those of the green revolution which, on the one hand, aims to artificialise and simplify the ecosystem as much as possible through the substantial use of external resources and, on the other hand, reduces the importance of – or even completely ignores – the issue of the effects and impact of agricultural practices other than maximization of productivity. However, **to respond to the imperatives of production intensification**, food security and the fight against poverty in the least developed countries, **agroecology does not exclude the use of certain practices taken from the green revolution**. Part of the agroecological transition of production systems may include the use of mineral fertilisers in addition to

organic fertiliser in order to restore the fertility of depleted soils. It may also include the use of certain chemical inputs limited to products, which are registered and pose little risk to human health, when there are no reliable alternative techniques that are available to farmers<sup>2</sup>.

This is where it is important **not to confuse agroecology and organic farming**. Organic farming is indeed part of agroecology, but some agroecological systems do not fully meet the principles and specifications of organic agriculture. Conversely, many agroecological systems meet objectives that go beyond these principles and specifications (energy saving, accelerated soil fertility restoration, autonomy of family farms, social dimensions of agroecology, etc.)

Although some of these agroecology objectives are objectives sought directly by farmers, other objectives may address a more general point of view (communities, general interest of the country, humanity as a whole, and in particular the fight against climate change).

Beyond the dimension of agricultural production, agroecology also covers other dimensions, such as:

- the transformation of the entire food system, aiming for more sustainable patterns of production and consumption,
- the social and cultural dimensions: a social movement, a civil society project at different levels based particularly on promoting autonomous smallholder farming, the reappropriation of traditional knowledge and new relationships between farmers and consumers.

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2. For readability reasons, we do not use inclusive writing in this document. The term “farmers” represents both the men and women farmers.

In order to achieve this, the member organisations of the GTAE have partnered with several university teams, development NGOs from West Africa and with the training and research unit on comparative agriculture and agricultural development of AgroParisTech to develop a first draft of a common method to evaluate the conditions for and effects of agroecology and implement it in three Sudano-Sahelian zones in Burkina Faso, Senegal and Togo. This work has been done in 2017 in the framework of the CALAO project within the PASANAO project, with support from ECOWAS and the AFD.

The seminar held on the 14<sup>th</sup> and 15<sup>th</sup> of December was intended to introduce and encourage debate regarding this method, but also to improve it thanks to other methodological experiments, which have been designed and implemented by research centres, training centres, NGOs or organisations of agricultural producers throughout the world. This was in order to compare methods, their relevance and limits, conditions for implementation and the type of results they provide. More specifically, the GTAE, thanks to this confrontation of methodologies, intended to improve and complete the existing methodological approach to evaluate agroecology.

The seminar was organised in four half-days, focusing on four main areas:

- the evaluation of factors that further or limit the development of agroecology,
- the evaluation of socio-economic effects and impacts,
- the evaluation of agro-environmental effects and impacts,
- the findings of the first three half-days and the conditions for a transversal approach.

For each of the first three half-days, four different methodological experiments were presented in plenary (that is to say, the CALAO project experiment and three other experiments, on each day). These were then discussed in group sessions, followed by a general reproduction of these sessions' results and a plenary debate. For the fourth half-day, three "great witnesses" were invited to share their views and a debate was held in plenary. Finally, a conclusion on learning points from the seminar was proposed.

The workshop proceedings for each half-day/focus point can be summarised as follows:

- presentations (methodological experiments and great witnesses),
- discussions held in groups and plenary,
- lessons learned (for the 4<sup>th</sup> half-day, these are the lessons learned from the seminar as a whole).

Finally, the last two chapters consist of the main conclusions and findings of the workshop which will help define a common methodological basis.

The proceedings are accompanied by a number of annexed documents available online. These include the input of each speaker, as well as the power-point presentations.



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# WORKSHOP CONCLUSIONS



As a conclusion to the workshop, Frédéric Apollin, AVSF executive director, presented a summary of all the exchanges with the desire to highlight the key outcomes of the two days of presentations and methodological construction.

Firstly, Frédéric Apollin came to the conclusion that during the seminar, not one but several evaluation methods were presented. They vary in their approach as they all target “political” objectives: to measure and evaluate in order to defend an agricultural model, such as smallholder farming, in order to demonstrate a potential impact on the environment or climate change within a territory thanks to the use of a particular approach or practice, etc. It must be acknowledged that **a truly neutral position in any evaluation exercise is impossible**.

As the participants’ share the objective of the methodological construction for the evaluation of effects and impact of agroecology, this should both respond to a will to **appeal to policy-makers and investor for development and agricultural aid** in order to convince them of the relevance and effectiveness of agroecological transitions thanks to objective facts, and also to the request by practitioners for tools to **guide advice and the support process for farmers**. We recall the implicit view of the seminar and its organisers – the GTAE – to strengthen agroecological transitions more specifically toward family and smallholder agricultural systems and territories, for the development of southern countries.

In the light of the methods presented, the priority is perhaps not to define a single method, but to **specify the fields of investigation and evaluation, as well as truly distinctive indicators in the case of agroecology** by using the existing methods and tools (socio-economic, environmental, “carbon footprint” assessments, etc.). If a single method does not exist, **unified criteria should be defined so that any method of evaluation will include and qualify them** to ultimately allow for objective comparisons of situations. The idea is to build a sort of **common standard for all**. These fields and evaluation criteria must also inevitably **focus on three complementary and relevant scales: plot, farm, territory**.

Due to the consideration of interactions within a farm or territory and the articulation of the different scales of analysis, which are specific to an agroecological approach, it is necessary to **consider multiple and multidisciplinary variables**. Analysing and measuring the effects of practices on these different scales calls for several types of indicators for technical and socio-economic performance, agro-environmental aspects, social aspects (well-being, culture and knowledge, etc.) and also the resilience of farms and territories facing climate or economic risks. Finally, these exchanges clearly demonstrated that we need to **focus on trajectories and not just technical changes, in order to identify the criteria determining the evolution of practices at different observation scales**.

The table below presents a 1<sup>st</sup> approach – resulting from the seminar’s discussions – for evaluation criteria, including those considered more specific to the evaluation of agroecological transitions processes. We now need to deepen the reflection and work on the many criteria mentioned, in order to specify the most relevant measurement indicators and specific methods and tools for their quantification or qualification.

Finally, the seminar has also allowed a number of recommendations in these evaluative procedures to be highlighted. Firstly, it is important to **take into account the “time” factor** by distinguishing – and combining – research programs which often take place over long periods of time, and the evaluations of practitioners carried out on the often short project duration, for which the defined criteria must be partly measurable (ex-ante and ex-post). Some areas of evaluation, the criteria and measurement methods to which they are associated should be clearly differentiated and organised among these actors and action types.

## ANALYSE THE PRACTICES AND TRAJECTORIES OF CHANGE

General criteria	“Specific” agroecology criteria
<b>AT PLOT SCALE</b>	
Production - productivity of land	Green level of practices; wild and domestic biodiversity (breeds, varieties)
Economic performance: - Income per hectare and per worker - Added value per ha and per worker	Reduction of negative externalities: pollution, etc.
	Carbon sequestration and limitation of greenhouse gas emissions (CO <sub>2</sub> , N <sub>2</sub> O, CH <sub>4</sub> )
Soil fertility	
Work and farm labour force management	(taking into account M/F work distribution)
<b>AT “FARM” SCALE</b>	
Production - productivity of land	Food and nutritional security
Economic performance: - Income per hectare and per worker, added value per ha and per worker - Job creation on the farm - Evolution of trading accounts - “Well-being”	Quality (nutritional, organoleptic and health), price and improved value of products in supply chains and markets  Acceptability of these products by processors, distributors and consumers
	Wild and domestic biodiversity (breeds, varieties)
	Carbon footprint
Agricultural labour force management; arduous nature of work (M/F)	
Autonomy of farms (availability of organic matter, power, wood, inputs...) Decision-making autonomy	
Resilience and risk management (climate, economic)	
<b>AT TERRITORY SCALE</b>	
	Positive externalities: - Energy self-sufficiency - Soil and landscape preservation - Natural and domestic biodiversity preservation and restoration - C and other GHG sequestration - Regulation and optimisation of water use (multi-purpose)
Fair distribution of land, water resources (multi-purpose) and means of production  Inherent rights protection	Organisational dynamics and new links created between actors in the territories, especially on product supply chains and markets
	Preservation and enhancement of knowledge and cultures
Respect for human rights (gender, minorities, children)	
Economic valuation of land	

It is also essential to constantly bear in mind that the **overall performance of agroecology and the transition process has to be measured by the performance of all of these evaluation criteria** (as previously stated, this may make it necessary to articulate some actions on the short term and others on long term, according to the desired objectives). **It is necessary to associate the understanding of the question “why” and the causal relations to this measurement of quantification and qualification of performances.**

Finally, **the concept “of silent agroecology”**, which is carried out, even if just partially, while not claimed as such, is a reminder that farmers are indeed the bearers of permanent, sometimes barely visible, innovations for which it is necessary for us researchers and practitioners, to understand the underlying reason. **These farmers are at the heart of the evaluations that need to be shared.**

In the conclusion of his speech, Frédéric Apollin presented topics to explore in the future, arising directly from the works carried out during this seminar. The following will certainly mobilise the GTAE NGOs and its' partners:

The primary task is to **continue the work on methods and evaluation criteria, in particular the identification of specific indicators related to agroecological transitions and the most relevant methods to quantify or qualify them.** Possible short and long term measurement methods have to be distinguished. This project is expected to mobilise and link donors (with respect to their evaluation and accountability expectations), practitioners and researchers.

**There will also have to be more in situ evaluations of agricultural systems and territories undergoing transition in order to accumulate references.** These should ultimately contribute to the demonstration work on **the relevance and modernity of the choice for agroecological transition**, and this even more so in contexts and territories where family and smallholder farming is very present.

Finally, there was a proposal that the GTAE be able to contribute together with research and teaching to system for training, **sharing information and experience between stakeholders** (collaborative strengthening), both with regard to existing “methods” and “tools”, their limits and complementarity, and to the areas of evaluation and the specific criteria and indicators linked to agroecological transitions.

# **FINDINGS OF THE WORKSHOP TO DEFINE A COMMON METHODOLOGICAL BASIS**

## **WHAT ARE THE CONSEQUENCES FOR THE GTAE'S NEW EVALUATION TASKS?**



This concluding chapter seeks to identify the main findings of the workshop in order to build common approaches and tools to analyse and evaluate performance, effects and impacts of agroecological practices. This includes highlighting elements from different methods that can help improve and strengthen the evaluation method implemented by the GTAE within the CALAO project. Particular attention was given to the **feasibility of the tools and methods** in terms of skills, time and costs for field practitioners in the framework of cooperation interventions. Evaluation grids are available at end of this chapter in order to clarify, in this context, which indicators and tools are potentially available to measure the socio-economic measurement and agro-environmental effects of agroecological practices and systems.

## **1 EVALUATION METHODS OF FACTORS THAT FURTHER OR LIMIT THE DEVELOPMENT OF AGROECOLOGY**

- The approach presented in the CALAO project is centred on evaluation questions which have to be adapted to each specific context. These questions are organised around a dozen of analysis axes ranging from agroecological practices related to the farmers' objectives (adoption factors) to the methods and support facilities, via access to land but also the environmental conditions (economic, socio-cultural, ecological)...
- The TYFA methodology for identifying material, technical, cognitive, and socio-economic resources mobilised in agroecological transitions in Europe (Marc Moraine, Sarah Lumbroso and Xavier Poux) focusses more on the different types of effects and impact than on the factors that further or limit agroecology. However, an approach to assess strengths and weaknesses could be integrated into the GTAE's approach.
- Several elements of the approach presented by Sarah Audouin could improve the methodology: analysing the innovation processes and role of various actors, institutions and networks; identifying three levels of technical change (adaptive, systemic and transformative); analysing the perception of external innovations by farmers; analysing the reflective process; **analysing organisations; tracking innovation step by step.**
- Regarding the method of analysis of the trajectories taken by the farmers within the CUMA groups to adopt greener practices (Stéphane de Tourdonnet):
  - The method proves to be more thorough, complex and involve more time than the method used in the CALAO project. Not everything can be used as part of the general evaluation method aiming to create comparable references on agroecology.
  - **Opting for an “actor approach” focused on specific practices** rather than on an “farm approach” is interesting as it gives farmers the opportunity to report their **trajectory of evolution** and get a good understanding of what prompted them to change their system. As the interview proceeds, information regarding the farm (size, crop types, etc.) will be collected.
  - Generally speaking, the method remains close to the analysis-diagnosis applied in the CALAO project, in particular when analysing the trajectories of evolution.
  - Developing graphs with farmers is interesting, as is retaining **some key practices as tools to communicate with them.**
  - The approach regarding the evaluation of the “green level” of systems can improve the part of our method related to the identification of agroecological practices.
  - Using the method as an animation tool can **strengthen the “debate, deepening and validation”** part with the actors in the territories.

## **2 EVALUATION METHOD OF THE SOCIO-ECONOMIC PERFORMANCE OF AGROECOLOGICAL PRACTICES**

A common methodology can be considered to bring to light the effects and impact of practices and agroecological systems. This will be done by using the analysis-diagnosis of agrarian systems and additional methodological elements for the identification of agroecological practices. When using a relatively simple tool, it can help **produce comparable evaluation results from different regions**. This methodology focuses on the evaluation of the economic and social effects and needs to be strengthened by promoting different methods presented during the workshop, in particular on the following points:

- A more detailed analysis of the conditions for implementation (resources, etc.) and compared effects of different practices, different levels of ecological intensification of agricultural systems or different trajectories of agroecological intensification.
- The **more accurate measure of effects and impact on social issues**: employment, evolution of the status of women and young people, food and nutritional security, by examining not only the level of families and production systems, but also the level of the territory
- Involving different actors into the process in a better way, in particular by **involving farmers more systematically in the analysis and validation of the diagnosis**. This can also foster the capacity for self-analysis and produce advice and decision support (contribution of the Fadear method). This can be integrated into the CALAO evaluation methodology which has mainly an “external” approach (by strengthening the role of exchange workshops on the evaluation’s interim results), and certainly even more so in the interventions dynamic in favour of agroecology: definition of objectives and contents of a project, criteria and indicators of the monitoring-evaluation, advice, help with decision-making.
- Integrating an **evaluation of the potential indirect economic effects at the supply chain level**, based on the works of the Centre For Agroecology, Water and Resilience (presentation by Paola Guzman)
- Making a connection between the various criteria and indicators and the SDGs (contribution of 4 per 1000)
- Integrating the autonomy of farms and the arduous nature of work (contribution of the Fadear method) as criteria
- Improving the integration of some effects and impacts at the territory level (environmental impact, employment offers, social cohesion and supply chains).

## **3 EVALUATION METHOD OF THE AGRO-ENVIRONMENTAL PERFORMANCES OF AGROECOLOGICAL PRACTICES**

Several areas of improvement or strengthening have been identified:

- Not a method but rather a methodological evaluation framework based on assessment questions associated with a toolbox. These tools must be adapted to each context and means available (human resources in quantity and quality, material and financial resources, “time” resource).

- Benefit of integrating the evaluation at the start of the agroecology promotion activities (projects, programs) by establishing a reference situation (crop and livestock systems, classified farm, territory/land with occupation of space, availability of resources, information from the different agri-environmental indicators). This also means fixing a method and tools right from the start, so that the measurement of the differences between beginning and end of action is possible.
- **Identifying the tools and evaluation methods that can be used without available baseline** (e.g. synchronic devices in networks of farm plots)
- Balancing out the declaration (sometimes necessary) and effective measures (not always possible) to collect information. It is a matter of striking a balance between the reliability of information and the accepted margin of error. Exchanges between researchers, development practitioners and farmers can allow available knowledge to be reviewed, in order to define the most relevant and easily accessible indicators.
- Promoting positive externalities at larger scales than the plot level (erosion, biodiversity, etc.). These are often not immediately observable if attention is only focussed on the direct and immediate effects
- Strengthening **three angles of evaluation: polyculture associated with livestock farming** (ex.: flows and cycles of organic matter and minerals) + **produced quantity and quality** (taste, nutritional, health) + **water management in particular in irrigated systems** (effect on yields vs potential negative environmental effects: emissions of GHG, salinisation and depletion of water resources, etc.).
- Maintaining the link between plot, farm and territory starting from collection of information to the analysis phase.
- Improving methods, criteria and indicators used to measure production, but also to assess and follow its inter-annual variability (risks), concerning both agro-environmental and socio-economic evaluation.

**PROPOSAL FOR AN EVALUATION GRID TO MEASURE THE SOCIO-ECONOMIC EFFECTS OF AGRO-ECOLOGICAL PRACTICES**

<b>Evaluated effects</b>	<b>Evaluation level</b>	<b>Indicators and variables</b>	<b>Method and tools</b>	<b>Importance and feasibility within the “GTAE” evaluation framework</b>
<p><b>Efficiency of production compared to the surface used and capital invested</b></p> <p><b>Labour productivity</b></p>	Plot or set of plots, farm	<ul style="list-style-type: none"> <li>- Gross margin of farming and livestock systems /ha;</li> <li>- Net farm income from the production system / ha, /day of work, /farm worker annually;</li> <li>- Inter-annual variability and risk of income below a certain threshold (evaluation from the family's point of view)</li> <li>- Gross and net added value /ha of the production system, / unit of invested capital, /farm worker per year (evaluation from the community's point of view)</li> </ul>	<ul style="list-style-type: none"> <li>- Development of a farm typology: diagnostic study of agrarian system</li> <li>- Technical routes and resources used: interviews</li> <li>- Production: interviews and estimates, possibly sampling and measurement of yields for a network of plots</li> <li>- Price: interviews and possible documentation</li> <li>- Calculation and economic modelling</li> <li>- Discussion</li> </ul>	Yes
<b>Food and nutritional security</b>	Farm	<ul style="list-style-type: none"> <li>- Food production vs needs</li> <li>- Income risk and food production risk (probability income/food production less than a certain level)</li> <li>- Nutritional quality (various food types) vs nutritional recommendations</li> </ul>	<ul style="list-style-type: none"> <li>- Investigations/ consumption core method and dietary diversity</li> <li>- Calendars and food/nutritional balance sheets</li> <li>- Discussion</li> </ul>	Yes
<b>Employment</b>	Farm, territory	<p>Employment needs for the different systems</p> <p>Maintaining and creating agricultural employment in the territories</p> <p>Remuneration for work</p>	<p>Investigations,</p> <p>Work calendar</p> <p>Discussion</p>	Yes

<b>Arduous nature of work</b>	Plot, farm	Comparative analysis of the practices with respect to the issues of the arduous nature of work (observations and perceptions of actors) and those involved in the farm (men, women, young people...).	Investigations Discussion	Yes
<b>Autonomy of farms</b>	Farm	Financial, economic and decision-making autonomy	Investigations Economic calculation Discussion	Yes
<b>Gender equity</b>	Farm	Distribution of tasks Arduous nature of work Social interest...	Investigations Discussion	Yes
<b>Role of young people</b>	Farm	Revaluation of agricultural activities Creation and distribution of income on the farm	Investigations Discussion	Yes
<b>Relationships and social dynamics</b>	Territory	Structuring effects on organisations Management and development of stakeholder social groups	Investigations Discussion	Yes
<b>Supply chains</b>	Territory and supply chain	Creation/dynamics/ evolution of agricultural sectors	Studies of sectors/value chain analysis Discussion	Yes

**SUGGESTION OF AN EVALUATION GRID TO MEASURE THE SOCIO-ECONOMIC AND ENVIRONMENTAL EFFECTS OF AGRO-ECOLOGICAL PRACTICES**

<b>Assessed effects or evolution of the means and techniques</b>	<b>Evaluation level</b>	<b>Indicators and variables</b>	<b>Method and tools</b>	<b>Importance and feasibility within the “GTAE” evaluation framework</b>
<b>AGRONOMIC EFFECTS</b>				
<b>Agricultural yields (yield of the year, average yield, variability)</b>	Plot	Production per unit area (grain, fodder). Components of the yield (according to study calendar)  Monitoring inter-annual variability	Interviews and estimates; possibly sampling and measurement of yields for a network of plots	Yes, with possible option on the measures and components of yield
<b>The components of soil fertility:</b>				
<b>Organic matter/carbon</b>	Plot and various plots of the farm (in case of transfer of Organic Matter)	Organic C content of the soil. Diversity, frequency, dose and quality of added organic matter.	Sampling, soil testing. The method of analysis should be the same everywhere	Yes, priority
<b>Biological activity of soils</b>	Plot	Macro/mesofauna (worms, termites, etc.) and microorganisms in the soil (bacteria, fungi), Soil structure	Biofunctool or other tools	Yes, priority
<b>Chemical fertility</b>	Plots and various plots of the farm (in case of transfer of Organic Matter)	PH, total levels of N, available P, exchangeable K, exchangeable Ca and exchangeable Mg	Sampling, soil analysis	Yes, with baseline analysis
<b>Flow of organic matter</b>	Farm and territory	Balance sheet of Organic Matter/flow of biomass within the farm and territory	Farmer surveys on Organic Matter/flow of biomass within the farm and territory	
		Balance sheet/carbon footprint of a farm or project	Tropicfarm tool Ex Act (at the territory scale)	
<b>Level of degradation and erosion risks</b>	Plot	Indicators of the state of the ground surface: rills, gullies (m/km <sup>2</sup> ), % closed surfaces, open and covered	Visual identification on the plot scale + possible analysis per m <sup>2</sup>	Yes, if possible and according to the analysed AE practices

<b>Level of degradation and erosion risks</b>	Land	Indicators of the state of the ground surface  Surfaces with water and land conservation practices.	Visual identification at the land level  Investigation and GPS measures of the surface area	Division of the territory into zones to be linked with the practices and history of occupation of the different spaces
<b>Evolution of the farmers technical itinerary, among others resource allocation, varieties, use of chemical inputs (mineral fertilizer, pesticides), etc.</b>	Plot	<ul style="list-style-type: none"> <li>- Change in the use of organic manure</li> <li>- Choice of variety and origin, seeds cost and quality</li> <li>- Indicator of Frequency of Phytosanitary Treatment (IFT); (IFT);</li> <li>- Change in the use of mineral fertilizers and organic manure</li> <li>- Change of rotation practices and intercropping</li> <li>- etc...</li> </ul>	Investigations	Yes
<b>ENVIRONMENTAL EFFECTS</b>				
<b>Plant cover</b>	Land	Trees and plant cover index in general	Transect sampling  Dendrometric measurements, and evolution analysis from earlier work available	Yes, priority
<b>Plant biodiversity</b>	Land/Plots	Diversity indices of plant species	Inventory of cultivated plants, fruit and forest species ANR and/or reforestation	Yes, priority
<b>Farmers' perception on the changing available resources and environmental risks</b>	Plot and land	Soil fertility indicators from local knowledge (local characterisation of soils and their evolution, indicator species...)	Investigations and working groups (focus)  Take into account different farmer groups and gender	Yes

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This document presents the work of the exchange workshop organized on December 14 and 15, 2017 by **the Working Group on Agroecological Transitions (GTAE in french)** and dedicated to methods to evaluate the performance of agroecology and development conditions. The event brought together a hundred international participants – development actors, researchers, members of farmers’ organizations, representatives of public authorities. The GTAE, in partnership with other NGOs and Universities, carried out in 2017, within the framework of the CALAO project “*Capitalization of experiences of actors for the development of resilient agroecological techniques in West Africa*” supported by ECOWAS and AFD, a draft common method for assessing the effects and impact of agroecological systems. The aim of this workshop was to present this method, to discuss it and to enrich it with other methodological experiences designed and implemented by research and development actors around the world.

The work of these two days highlighted the multiplicity of existing methods, but with **the possibility of constructing a common standard for measuring the performance of agroecological systems**. This involves analyzing the effects of practices and systems on different complementary scales of plot / farm / territory, using specific criteria and indicators for agri-environmental aspects (conservation of biodiversity, natural resources and soil fertility, carbon footprint, resilience to climate risks, etc.) and socio-economic aspects (income creation and added value, farm autonomy, work management, evolution of the control of resources by women and young people, product quality and economic valuation, protection of knowledge and farming cultures, etc.).

Thanks to this confrontation of methods, their interests, their limits and the conditions of their implementation, the workshop resulted in the proposal by the GTAE of a first evaluation grids with the **indicators and potentially mobilizable tools for the measurement of socio-economic and agro-environmental effects of agro-ecological practices and systems**. Regarding evaluation methods of factors that further or limit the development of agroecology, it appears the need to enrich the characterization of agroecological systems and practices through the analysis of the criteria determining the evolutionary trajectories of the systems and their “green level”.

This common base, whose content remains to be refined, should enable development practitioners to better evaluate their actions and to compare situations from different territories with the challenge of both **convincing policy makers** of the relevance and the effectiveness of agroecological transitions on objective elements, but also **to guide farmers advice and their support process in this transition**.

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