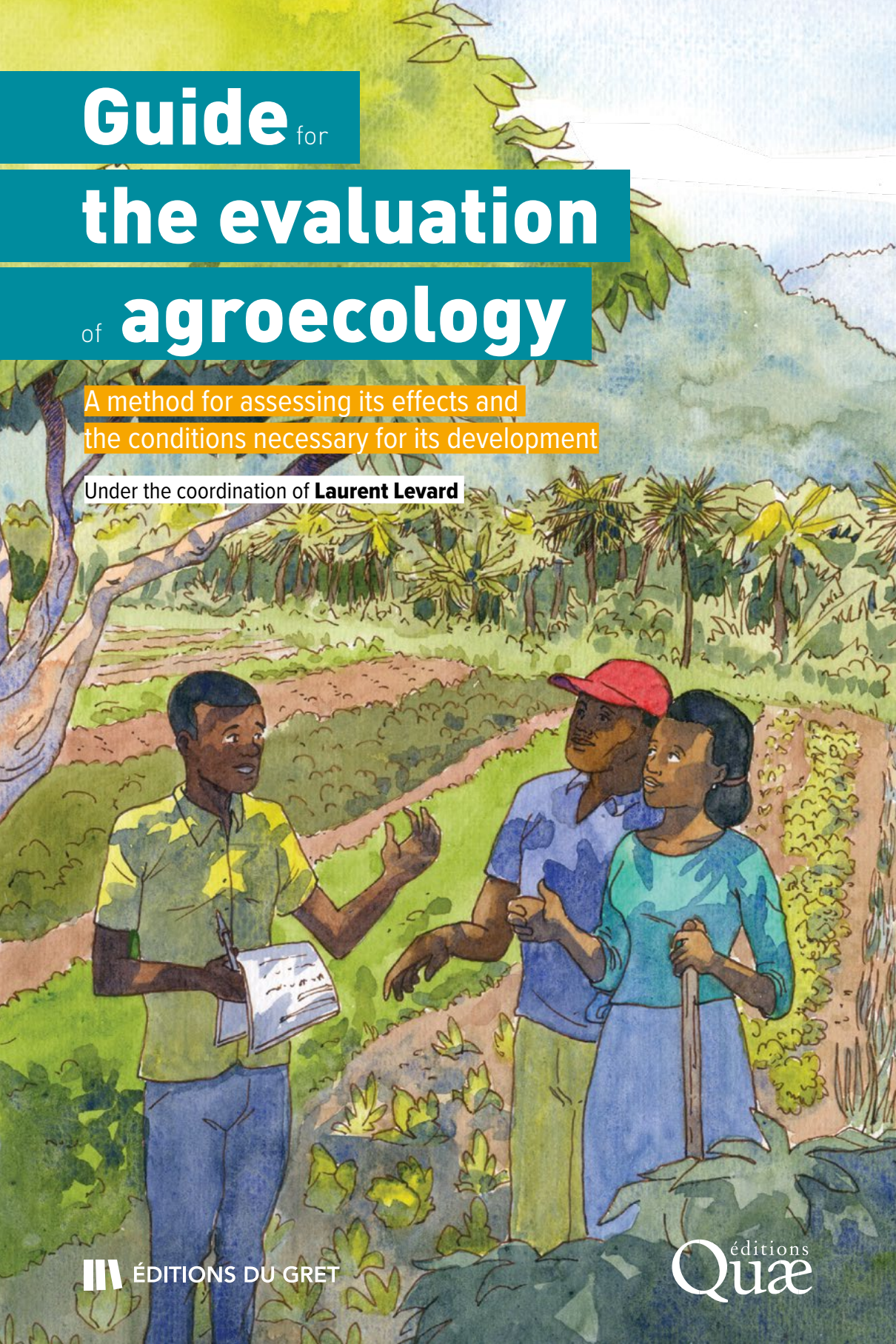
Guide for the evaluation of agroecology

A method for assessing its effects and the conditions necessary for its development

Under the coordination of **Laurent Levard**



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This methodological guide is the result of collaboration between:

- the Working Group on Agroecological Transitions (GTAE), which is made up of Agrisud International, Agronomes et Vétérinaires Sans Frontières (AVSF), the Centre for International Actions and Achievements (CARI) and GRET;
- the Comparative Agriculture and Agricultural Development teaching and research unit at AgroParisTech;
- the Agroecology and Sustainable Intensification of Annual Crops (Aïda) research unit at the French Agricultural Research Centre for International Development (CIRAD);
- the Functional Ecology and Biogeochemistry of Soils and Agro-systems (Eco&Sols) mixed research unit at the French National Research Institute for Sustainable Development (IRD);
- Institut Agro Montpellier.

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The Working Group on Agroecological Transitions (GTAE)

Agrisud International, AVSF, CARI and GRET are four French NGOs whose professional action to promote sustainable development focuses largely on agroecology. These organisations support peasant and family farming, and defend and promote agroecology in different contexts to develop territories for rural populations. Together with their partners throughout the world, they have confirmed practical experience in various fields. They have published on the subject and are often involved in and invited to contribute to the national and international public debate on the agroecological transition.

In January 2016, Agrisud, AVSF, CARI and GRET set up the GTAE working group, which focuses on the agroecological transition. The objective was – together with the world of research and based on their own experiences in cooperation with their partners in developing countries, farmers' organisations and NGOs – to carry out work to validate the conditions necessary for successful agroecological transition and measure the effects and impact of agroecology in order to contribute, ultimately, to the desired change of scale. Drawing on its analysis of these experiences and their findings, the group wanted to increase its capacity for policy dialogue in order to strengthen existing collective advocacy for agroecology led by civil-society organisations both nationally and internationally.

Contents

Introduction

Agroecology is increasingly emerging as one of the pertinent responses to major global challenges in terms of economic and social development and the environment, largely reflected in the UN's Sustainable Development Goals (SDGs): improvement of the performance of food and agricultural systems, food and nutrition security, the environment, climate, employment, migration, and vulnerable rural populations' resilience and adaptation to climate change.

The term "agroecology" was not coined until the 1920s, but agroecological practices and systems – although they are not always studied and referenced – are not new. Peasant and family farms[1] implement, to a smaller or larger degree, practices and systems that may be considered agroecological, i.e. they make it possible to reproduce the cultivated ecosystem and protect the environment, while also being economically viable and socially acceptable.

In the 1960s and '70s agroecology, as a science, became more widespread in scientific communities, as well as among farmers' organisations and civil-society organisations that wanted an alternative agricultural model to the one largely disseminated by the Green Revolution.

This is why initiatives – by NGOs, farmers' organisations, professional agricultural organisations, research centres, academic institutions, companies and public institutions – are being developed to support transition processes by promoting and supporting agroecological practices and systems. Most of these stakeholders, however, still lack the tools needed for evaluating the economic, social and environmental effects of agroecology, and for better understanding how certain factors facilitate or hinder its development.

Scepticism is sometimes expressed as to whether agroecology is a suitable solution in response to the challenges currently faced. These concerns are felt by decision-makers and throughout the agricultural community. Numerous evaluations and one-off studies have been conducted in recent years, but these often cover only a narrow spectrum of agrosystems, territories and practices. They are scattered, partial, incomplete or conducted using different methods and tools.

1. In this Guide, the concept of "agriculture" covers both crop and livestock production. A farm may therefore have livestock-production activities in addition to other activities, or it may be entirely devoted to livestock production. Likewise, a farmer may be someone who raises livestock either exclusively or in addition to other activities.

Systematic references produced using a robust common methodology are still lacking. Demand for reliable, aggregate data on the effects and conditions necessary for the development of agroecology, however, is on the rise among political decision-makers, farmers and development stakeholders.

It is against this backdrop that GTAE's member organisations – Agrisud International, AVSF, CARI and GRET – conducted joint work on the evaluation of agroecology with their academic and research partners: AgroParisTech, CIRAD, IRD and Institut Agro Montpellier.

An initial framework for evaluating agroecological practices and systems was defined under the Calao project, which sought to capitalise stakeholders' experiences for the development of resilient agroecological techniques in West Africa. The project was implemented in 2017 in three West African countries (Burkina Faso, Senegal and Togo) in partnership with AgroParisTech and various universities and NGOs, with support from the Economic Community of West African States (ECOWAS) and AFD. This initial experience led to the publication of a report[2].

The approaches and methods used by different stakeholders to evaluate agroecology were presented and discussed at a methodological workshop organised in Paris in December 2017, with support from AFD and the French Facility for Global Environment (FFEM)[3].

Drawing on the experience of the Calao project and the results of the methodological workshop, GTAE, AgroParistech, CIRAD and IRD produced a *Handbook for the Evaluation of Agroecology*, which was published in 2019, and later translated into English and Spanish.

The methodological approach proposed in the handbook was implemented in a number of areas under the Oscar project[4] (Burkina Faso, Cambodia, Ecuador, Haiti[5]) and as part of a project carried out for the Agricultural Water Scientific and Technical Committee (COSTEA) (Algeria, Cambodia, Senegal[6]), both funded by AFD.

These experiences made it possible to test, validate and improve the method, and prepare this Guide for the Evaluation of Agroecology. The fieldwork that was carried out also provided practical examples of how to apply the method.

2. Levard and Mathieu, 2018.
3. Berton S. *et al.*, 2018.
4. Strengthening civil society organisations for successful agroecological transitions.
5. The areas in question are: Burkina Faso, villages of Guiè and Douré, in the Sahel area, under the Sharing the Sahelian Bocage (*Bocage sahélien en partage*, BSP) project supported by ECOWAS; Cambodia, Siem Reap region, as part of the Apici project, with support from the Hauts-de-Seine Departmental Council; Ecuador, Píllaro canton, in the Andes region, under the project supported by Fondation Ensemble; Haiti, commune of Saint-Raphaël, as part of the Agricultural Research-Training-Extension Programme on Adapting to Climate Change in the commune of Saint-Raphaël, in Haiti's Nord department, with support from the Inter-American Development Bank.
6. Project coordinated by AVSF in collaboration with CARI, GRET, CIRAD and local partners (APEB, Torba, Cread for Algeria; Enda Pronat and ISRA for Senegal; UBB for Cambodia) to study the performance of agroecology and the conditions necessary for its development in different irrigated systems. The areas in question are: Algeria, large agricultural water project in the Mitidja plain and irrigated oasis agriculture in the M'Zab valley; Cambodia, two zones with a predominant focus on irrigated rice production in the Battambang region, with varying levels of water control ; Senegal, market gardens in the Niayes region and large agricultural water project managed by SAED in Guédé (https://www.comite-costea.fr/actions/agroecologie/).

PURPOSE OF THE GUIDE

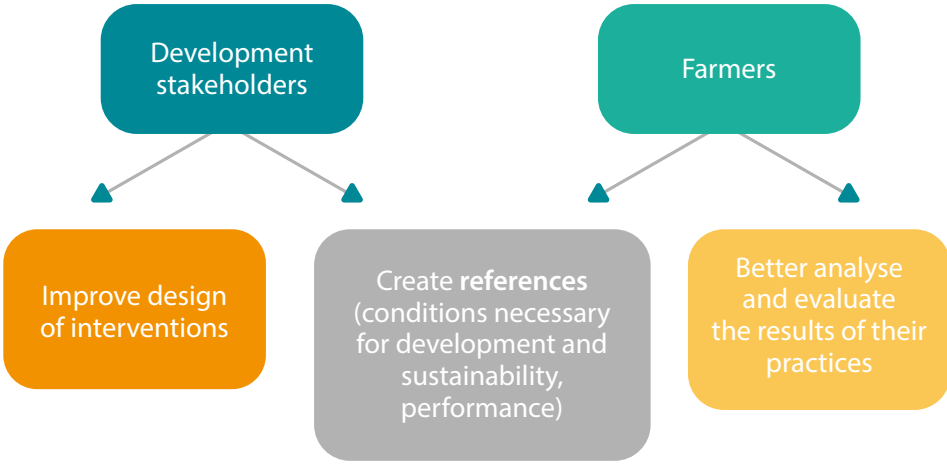
This Guide has three objectives.

The first is to help development stakeholders **improve the design of their interventions** (projects, programmes, public policies) in favour of agroecology. Evaluating agroecology makes it possible to identify which agroecological practices and systems to promote and which systems to implement with a view to supporting, advising and working with farmers. The evaluation may be conducted before an intervention, during an intervention to implement corrective or incentivising measures (adjustments to the intervention system), or in preparation of or with a view to future interventions. The evaluation is therefore a tool that development stakeholders can use to help them guide interventions and make decisions.

The second objective is to **create references** on the agro-environmental, economic and social performance of agroecology, and on the conditions necessary for its development and sustainability. This objective may be of interest to development stakeholders and farmers alike. References are useful for better assessing the usefulness of agroecology and identifying which measures to take in order to promote and facilitate the development of agroecology, particularly among public authorities.

The third objective is to work with farmers to help them better **analyse and evaluate the results of their practices** so that they can make more informed decisions regarding possible technical and economic changes that would be more or less strategic. The evaluation is therefore a decision-making tool for farmers.

Figure 0.1. Users and objectives of this Guide.



OBJECTIVE

The overall objective of this Guide is to offer an approach and methodological tools for assessing the effects of agroecological practices and systems on the agro-environmental and socio-economic performance of agriculture, and for assessing the conditions necessary for the development of those agroecological practices and systems.

With regard to evaluating the **effects of agroecological practices and systems**, the areas in which these practices and systems are likely to have an impact, and for which an evaluation method is proposed, are as follows:

- agro-environmental: crop yields, soil health, water-management performance at plot level, regulation of bio-aggressors, agricultural biodiversity and reduction of exposure to pesticides;
- socio-economic: crop and livestock yields, economic performance from the farmer's point of view, value chains and organisation of trade, the attractiveness of agriculture for young people, job retention and creation, autonomy, food security, farm resilience and ability to adapt to climate change[7].

Where relevant, this Guide proposes methods for evaluating effects differentiated according to a gender-specific approach, with particular attention given to gender equality.

With regard to the **conditions necessary for the development of agroecological practices and systems**, this Guide presents a set of factors to be analysed, as they are likely to play a role in facilitating or hindering the implementation of agroecology on farms and within territories, depending on the context.

Four comments may be made on the formulation of this overall objective.

- An agricultural practice never exists in isolation: it is part of a **coherent set of practices forming a system** (crop-production system, livestock-production system, agricultural production system, agrarian system). That is why it is systems, above all, that are evaluated, not just specific practices. The agricultural production system, for its part, includes all activities in connection with the production and marketing of agricultural products, as well as on-farm storage and processing (where applicable).
- When defining an agroecological practice or system, we start from the idea that agroecology complies with a certain number of principles. The FAO has defined ten elements of agroecology[8]. Practices and systems may vary in how well they comply with the principles of agroecology as a whole, or they may comply closely with some principles and less closely to others. That is why, instead of referring to **practices or systems as being agroecological or non-agroecological**, we prefer to refer to them as being more agroecological or less agroecological. In this Guide, we present the principles of agroecology that we use, as well as a grid that can be used to define how closely a particular farm complies with these principles (see Tool Sheet 8, Characterisation of the degree of agroecologisation of farms).
- Some of agroecology's economic and social effects (improvement in power relations for farmers in value chains, empowerment of women, etc.) result less from agroecological practices and systems as such, than from the **social and institutional dynamics** that support and enable their development (creation or strengthening of farmers' organisations or organisations providing support, etc.). In this Guide, we have decided to limit ourselves to the **effects of agricultural practices and systems as such**, even though it is not always possible to clearly differentiate between what results from the development of agroecological practices and systems, and what results from social and institutional dynamics.

7. Crop yield may be considered as both an agro-environmental and socio-economic criterion.
8. Diversity, co-creation and sharing of knowledge, synergies, efficiency, recycling, resilience, human and social values, culture and food traditions, responsible governance, circular and solidarity economy (FAO, 2018).

- "Development of agroecology" refers to **all of the processes for testing, adapting and expanding agroecological practices and systems** at different levels – from plot, livestock-production activity and farm as a whole, up to territorial level. The dynamics of the development of agroecology include agroecological-transition processes, i.e. the transition from systems that are non-agroecological or slightly agroecological to systems that are substantially agroecological.

Agroecology is likely to have essential effects for which no evaluation methods are proposed in this Guide. Examples include its effects and impacts on carbon sequestration and climate-change mitigation on the one hand, and human health on the other. Such evaluations would require systems that are much larger, more complex and longer-lasting than the ones proposed in this Guide. These evaluations are generally carried out as part of studies conducted by scientific teams, and the evaluator may supplement his/her evaluation with a desk review of documents focusing on these questions. The evaluation of effects in terms of exposure to pesticides (see Evaluation Sheet 6, Reducing exposure to pesticides) and food security (see Evaluation Sheet 14), however, provides important information for the evaluation of effects and impacts on human health.

All of the criteria proposed in this Guide for evaluating agro-environmental and socio-economic effects contribute to the SDGs defined by the United Nations, and more specifically to the goals appearing in Figure 0.2.

Figure 0.2. Main SDGs supported by the proposed evaluation criteria.

Focus

Specificities of the proposed methodological approach

A growing number of scientists and development stakeholders are taking interest in the evaluation of agroecology, such as the FAO with the TAPE tool for evaluating the performance of agroecology, which GTAE, CIRAD and IRD helped develop[9].

This Guide draws on various pre-existing methodological tools that have been adapted to the objective of evaluating the effects and conditions necessary for the development of agroecology. The main characteristics of the proposed method are as follows:

- the proposed methodological tools fall under one of the two general approaches (general approach for one-off evaluations, and approach for monitoring and evaluation);
- the method takes into account the evaluation of agro-environmental effects, socio-economic effects and conditions necessary for the development of agroecology;

9. FAO, 2021.

- it was decided to conduct an in-depth study of the different farms and plots (case studies), which requires a small, and therefore purposive, sampling;
- the typology of farms used for sampling and for making comparisons draws on the general characterisation of farms, and not solely on how agroecological they are;
- the characterisation of the degree of agroecologisation of farms draws solely on the principles of agroecology that characterise the agricultural practices and systems themselves (biodiversity, synergies, recycling of elements, etc.), and not on those that characterise more the conditions necessary for the development of agroecology (responsible governance) or the effects of agroecology (resilience). The generic grid used to characterise the degree of agroecologisation also needs to be adapted to each context.

STRUCTURE OF THIS GUIDE AND INSTRUCTIONS ON HOW TO USE IT

This Guide is divided into **three parts**.

The first part presents the **general approaches** for one-off evaluations and for monitoring and evaluation, with three chapters: Chapter 1 covers general methodological principles, Chapter 2 covers the general approach for one-off evaluations, and Chapter 3 covers the general approach for monitoring and evaluation.

The second part consists of various **evaluation sheets** covering different aspects that are likely to be impacted by agroecology and that should therefore be evaluated. These evaluation sheets are grouped together in three chapters covering the agro-environmental evaluation (Chapter 4), the socio-economic evaluation (Chapter 5) and the evaluation of the conditions necessary for the development of agroecology (Chapter 6).

The third part consists of eight **tool sheets** providing methodological supplements needed at certain stages of the approach for one-off evaluations or the approach for monitoring and evaluation.

Depending on the situation, the evaluator may refer to Chapter 2 (General approach for one-off evaluations) or Chapter 3 (General approach for monitoring and evaluation), bearing in mind that monitoring and evaluation also follows the approach for one-off evaluations at certain key stages (baseline situation, final evaluation, and potentially an interim evaluation). And regardless of the situation, the evaluator must familiarise himself/herself with the general methodological principles outlined in Chapter 1 (General methodological principles).

The evaluator will also use various evaluation sheets and tool sheets, depending on the stage and specific objectives of the evaluation.

With regard to the evaluation sheets, it is not possible (owing to time constraints) to expect to evaluate the effects of agroecology on all the aspects for which an Evaluation Sheet is proposed. It is essential to evaluate the effects of agroecology on certain aspects, while it is optional for other aspects (for more details, see Chapter 1, General methodological principles).

With regard to the tool sheets, three of them mention additional documents available on the internet[10], which the evaluator may use: Tool Sheet 4, Grid for analysing issues linked to a key feature of the territory, Tool Sheet 7, Presentation of the spreadsheet for automated economic calculation and its user manual, and Tool Sheet 8, Characterisation of the degree of agroecologisation of farms.

10. These files are available for download on the websites of Éditions du Gret and Éditions Quæ.

PART 1

General approaches for one-off evaluations and for monitoring and evaluation

1 CHAPTER

General methodological principles

This chapter presents the general methodological principles for one-off evaluations and for monitoring and evaluation, i.e. the evaluation's objectives and situations of use, as well as four key aspects of the methodology: the comparative approach, consideration of different scales, consideration of impacts on gender equality, and the participative approach.

EVALUATION OBJECTIVES AND SITUATIONS OF USE

Objectives

As stated in the introduction, the overall objective of evaluating agroecology is to assess:

- its effects on the **agro-environmental and socio-economic performance** of agriculture;
- the **conditions necessary for its development**, i.e. the factors that facilitate or hinder its implementation on farms.

The specific objectives refer to aspects for which one wishes to evaluate the agro-environmental and socio-economic effects of agroecology. An evaluation sheet for each aspect is provided in this Guide (see Introduction).

It is not possible to expect to evaluate the effects of agroecology on all the aspects for which an evaluation sheet is provided. Nor would it be relevant, as the effects to be evaluated depend on the specific context of each territory, and on the specific expectations of the sponsors who commissioned the evaluation and local stakeholders. It is therefore the specific objectives of the evaluation and the specific issues affecting the territory that determine which aspects to focus on, and therefore which evaluation sheets the evaluator will use. The evaluation of certain aspects, however, seems indispensable: yield according to stakeholders (see Evaluation Sheet 7, Crop and livestock yields – estimate according to stakeholders), economic performance from the farmer's point of view (see Evaluation sheets 8 and 9) and, in most situations, the conditions necessary for the development of agroecology (see Chapter 6). The evaluation of other effects is optional and should be assessed in accordance with the specific objectives of the evaluation and available resources. For the socio-economic evaluation, it is generally recommended to examine the effects on at most two or three additional aspects, in addition to the indispensable aspects. For the evaluation of agro-environmental effects, it is recommended to focus on a maximum of three or four aspects.

Two situations of use

This Guide may be used in two different situations.

- A **one-off evaluation** may be conducted before, during or after an intervention to evaluate practices and systems at a given point in time *T*, following the approach for one-off evaluations presented in Chapter 2.
- A **monitoring-and-evaluation system** may be put in place to monitor and evaluate the evolution of the agroecological practices and systems promoted by an intervention (project, programme or public policy) throughout that intervention, following the approach for monitoring and evaluation presented in Chapter 3.

Focus

Evaluating agroecological practices and systems versus evaluating an intervention

Evaluation of agroecological practices and systems must be differentiated from evaluation of an intervention (project, programme or public policy).

Agroecological practices and systems can be evaluated independently of any intervention. In addition, the standard evaluation of an intervention includes a certain number of criteria that have been established as benchmarks for the evaluation of development projects: relevance, effectiveness, efficiency, impact, sustainability, etc., which is not the case for the evaluation of agroecological practices and systems, even when conducted as part of an intervention.

The evaluation of agroecological practices and systems may, however, contribute to the evaluation of an intervention if:

- one of the intervention's objectives is to promote agroecological practices and systems: the evaluation of their effects thus contributes to the evaluation of the effects of the intervention itself;
- the analysis of the conditions necessary for the development of the agroecological practices and systems promoted by the intervention helps explain how pertinent, effective, efficient and sustainable it is.

KEY ASPECTS OF THE METHODOLOGY

Implementing a comparative approach

One essential aspect of the proposed methodological approach is the systematic attention given to the **differences between land-use patterns and between farms with varying degrees of agroecologisation**, and the attempt to find **the reason behind these differences**. This is why the proposed method falls within the comparative agriculture approach[1]. The aim is to:

1. For more on the comparative agriculture approach, see Cochet, 2016.

- evaluate and compare the differences in the results and performance of these land-use patterns and farms with varying degrees of agroecologisation;
- figure out why farmers make different choices and, ultimately, understand the conditions necessary for the development of agroecology, i.e. the factors that facilitate or hinder its development.

The evaluation of the effects of agroecological practices and systems is therefore based on comparing farms, plots or herds where certain agroecological practices and systems are implemented with "benchmark" farms, plots or herds where such practices and systems are not implemented (the "control group"). In the approach for one-off evaluations (see Chapter 2), the comparison is made at a given point in time *T*. In the approach for monitoring and evaluation (see Chapter 3), the focus is on the farms' trajectories of change compared with a baseline situation. It is important to compare, both during and at the end of an intervention, the trajectory of farms that implemented these practices and systems with the trajectory of farms that were initially similar but that were not beneficiaries of the project (or programme or public policy). It is not sufficient to compare the situation of beneficiary farms "after a project" with the same farms "before a project", because some of the changes occurring between these two periods may be attributable not to the intervention but rather to other factors such as the climate, the economic and institutional environment, or agricultural policies (see Figure 1.1A). Basing an evaluation on a simple comparison of beneficiary farms "before" and "after" an intervention would create a bias in the evaluation (see Figure 1.1B).

Another bias may be created in relation to the group of benchmark farms. It should be noted, first of all, that when a monitoring-and-evaluation system relating to a project (or programme or public policy) is implemented, it is possible, prior to the intervention, to identify a comparable group of farms which supposedly will not be beneficiaries of the actions and which will serve as a benchmark group for the comparative evaluation at the end of the intervention. But if there is no monitoring-and-evaluation system, or if it is not possible to know which farms will be beneficiaries and which ones will not be beneficiaries of the project, then the benchmark group can only be defined a posteriori. This definition needs to be made carefully, as there is a risk of choosing, as a benchmark group, farms that were not identical to the beneficiary farms at the start of the intervention (see Figure 1.1C).