METHODOLOGY FRAMEWORK

Ecosystemic Regenerative Agriculture

Methodology approved by ORMEX	2023_05_01
Reference	METH/AGR-MF01_EN_v4.2
Sector/Sub-sector	AFOLU/ **Cropland & Grassland**
Crop type	All
Project Type	All
Editor	ORMEX CONSULTING

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LIST OF ACRONYMS AND ABBREVIATIONS

Acronyms	Definitions
AFOLU	Agriculture, Forestry and Other Land Use
FAO	Food and Agriculture Organization
GHG	Greenhouse Gazes
IPCC	Intergovernmental Panel on Climate Change
NDC	Nationally Determined Contribution
MRV	Monitoring, Reporting and Verification
VCM	Voluntary Carbon Market
PDD	Project Design Description
SDG	Sustainability Development Goals
VVB	Validation and Verification Body

LIST OF REFERENCED DOCUMENTS

This document is drawn up in conjunction with the other Ormex Program documents listed below.

Document Id	Title
ORM/OPR/GLO	ORMEX GLOSSARY
ORM/ORP/PROG	ORMEX PROGRAM
SEC/OST/PR	ORMEX STANDARD PRINCIPLES AND REQUIREMENTS
SEC/OST/AM	ADDITIONALITY METHODOLOGY

Terms in "italics" are citations.

Terms in CAPITAL refer to a document of the ORMEX Program, and the references of the relevant sections of this document are specified. If the document concerned is not specified, the section reference refers to a section of the Methodology.

Terms with a capital are terms defined in the ORMEX GLOSSARY and listed in the ANNEX 1. LIST OF DEFINITIONS to facilitate the reading of this document.

In this document:

- The verbs “shall” and “must” are used to express mandatory commitments or obligations the Project must comply with.
- The verb “should” is used to indicate a recognized means of meeting the requirements and obligations of the Methodology, most of the time referring to the usual best practices. In some circumstances, it can also express a best effort obligation, meaning that the Project can meet the requirements or obligations in an equivalent way, but still in connection with ORMEX STANDARD principles, Methodology, VCM practices and professional behaviors that it would have to demonstrate.
- -The verb “may” is used to express that the means of implementation of the requirements or obligations is left up to the Project to decide, with no recommendation coming from the Methodology. In some circumstances, it can also express no commitment or obligation, but a possibility to do so left up to the Project Holders’ sole discretion.

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INTRODUCTION

The Agriculture, Forestry and Other Land Use (AFOLU) sector defined by the IPCC has long been recognised as having a major role in CO_2 reduction and storage strategies (Smith et al.,2014)[1] , however the complexity and diversification of agricultural techniques, particularly in terms of land use, leading to a sequestration potential for agriculture remains difficult to assess and monitor. This situation has meant that the potential of agriculture in the fight against climate change has been overlooked for a long time. Yet the potential for sequestering carbon in soils through agricultural practices worldwide is estimated at around 20 Pg C in 25 years, or more than 10% of anthropogenic emissions. While it is estimated that agricultural practices worldwide are responsible for around a third of GHG emissions, it is recognised by international bodies that the implementation of "*improved agricultural practices can help mitigate climate change by reducing emissions from agriculture and other sources and by storing carbon in plant biomass and soils*". [2].

Faced with the challenges of climate change that threaten food security, it is vital to take account of the multifunctional role of agriculture. The agroecological approach is increasingly recognised internationally as an innovative approach and a relevant tool for the transition and transformation of the agricultural and food system, particularly through its desire to understand the interdependent processes specific to a given scale.[3] Agroecology, through its holistic and integrated approach can contribute to a transition towards ecologically sustainable, economically just, viable and socially equitable food and farming systems (FAO)[4] (Olivera Rikke, et al.,2021)[5].

Agroecology therefore has a number of advantages, such as its ecosystemic approach, which makes it possible to categorise "agroecosystems", its territorial dynamics, its position

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[1] **Smith P.**, BUSTAMANTE M., AHAMMAD H. et al, 2014 "Agriculture, forestry and other land use (Afolu)". In Edenhofer O., Pichs-Madruga R., Sokona Y., et al. (eds.), Climate change 2014: mitigation of climate change. Contribution of Working group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom & New York, NY, USA: 811-922.

[2] Soil carbon sequestration | Soil Information Portal | Food and Agriculture Organization of the United Nations (fao.org)

[3] **HLPE**, Agro-ecological and other innovative approaches for sustainable agriculture and food systems to improve food security and nutrition. Report of the High-Level Panel on Food Security and Nutrition of the Committee on World Food Security, Rome, 2019

[4] **FAO**, Overview | Agroecology Knowledge Platform | Food and Agriculture Organization of the United Nations (fao.org)

[5] **Olivera Rikke**, Popusoi Doina; Sustainable Production, Markets and Institutions (PMI) Division; Stock-take report on agroecology in IFAD operations: An integrated approach to sustainable food systems; by the International Fund for Agricultural Development (IFAD); ifad.org

at the crossroads of various sciences (agronomic, environmental and social)[6] , the involvement of various stakeholders and the recognition of interdependent processes specific to a given scale. These are assets that can persuade project leaders at different levels to embark on a process of changing practices (or even systems, in the case of a project positioned on a territorial scale), and thus encourage an increase in the number of projects in the agricultural sector that help to reduce emissions and remove carbon.

In addition to considering the need for a significant change of scale in terms of removal in the agricultural sector, the ORMEX Standard's decision to take into account a Framework Methodology using agroecology principles as the basis for its programme is based on the following assumptions:

- The objectives of carbon removal involving the agricultural sector cannot overlook the need for transition and major transformation of the agricultural and food system, and fail to take into account the various challenges facing farmers. Farmers see themselves first and foremost as food producers, and agroecology, which includes maintaining yields and productivity, is a major incentive;
- It is necessary to respond to the criticisms recently levelled at certain GHG emission reduction projects for failing to take sufficient account of the needs of local populations in decision-making, benefit-sharing, subsistence levels or living conditions (Chevallier et al., 2020)[7] . A Standard and methodology that itself follows a holistic and integrated approach, fully recognising in the certification and verification procedure, the monitoring of indicators used in assessing the performance of agroecology systems fully responds to these criticisms;
- The sole objective of carbon sequestration cannot be the only motivating factor in getting the various players involved. The multitude and choice of objectives, greater visibility for project leaders of the various ecosystem issues on which they interact, directly or indirectly, and monitoring of the performance of their actions and results are decisive factors in getting people into action. Agroecology makes it possible to approach performance and results at various levels (plot, farm, landscape/territory, national territory);
- We need to improve our understanding of the direct and indirect causal links between the practices implemented and the achievement of the Sustainable Development

[6] Gliessman, *S.R. 2007. Agroecology: the ecology of sustainable food systems. 2nd Edition. Boca Raton, USA, CRC Press. 384 pp, Tomich et 4 al., 2011). "Agroecology translates the intersection of agronomic, environmental and social sciences in order to constitute a source of innovations for the re-construction and sustainable management of agroecosystems*".

[7] Chevallier, Tiphaine (dir.) ; et al. Soil Carbon in Africa: Impacts of Land Use and Agricultural Practices. New edition [online]. Rome, Marseille: IRD Éditions, 2020 (generated on 29 January 2022). https://doi.org/10.4000/books.irdeditions.34867

Goals (SDGs). The 13 agroecological principles and 10 agroecological elements[8] will help to achieve this;

- It is essential to have a methodology that is itself based on an integrated approach, enabling synergies in data management and recognition of the Project by the various systems and expectations. The homogeneity of procedures, indicators and data typologies with other systems with which the project promoter also wishes to interact is a source of added value for the time spent preparing Projects, monitoring indicators and collecting the associated data. The Methodology favours comparative approaches that encourage synergies between reporting systems;
- While it should be recognised that there are as many agricultural and food practices and systems as there are varieties of carbon sequestration potential, these diversities must be analysed together. The imprecise nature of agroecological practices means that approaches can be tailored to local contexts (HLPE, 2019), while taking account of specific interdependent processes at different scales;
- The imperatives of transition and transformation of agricultural and food systems require greater investment and financial efforts in the design and implementation of innovative approaches and practices involving Agroecology (HLPE, 2019);
- Methodical tools that are easy to understand, accessible to all, effective and simplified are needed.

Finally, the Methodology aims to meet the conditions of Additionality, Permanence, Measurement and Verification imposed by the ORMEX Standard.

This Methodology is not intended to be a method of comparative assessment of the various innovative and conceptual approaches to transforming agricultural practices (agroecology, regenerative agriculture, permacultures, conservation agriculture, etc.), nor a method of evaluating agroecological systems. It is intended simply as a tool to assist the transition towards sustainable and resilient agriculture.

[8] The 10 elements of Agroecology approved by FAO Committee - ca7173en.pdf (fao.org)

1 METHODOLOGY PURPOSE

The purpose of this "ECOSYSTEMIC REGENERATIVE AGRICULTURE" methodology, referred to as "the Methodology", is to detail the general conditions, requirements and procedures to be implemented by the Project Holder in order to comply with the ORMEX STANDARD - PRINCIPLES AND REQUIREMENTS (referred to as the "ORMEX STANDARD").

To be able to respond and adapt to the territorial diversity and complexity of agricultural activities, and thus be widely used, the Methodology wishes to position itself as a Framework Methodology. It could be supplemented by specific methodologies to provide a more precise framework for the diversity of situations.

Unless otherwise specified in the ORMEX STANDARD, the provisions of the Methodology complement and/or implement the requirements of the ORMEX STANDARD for the purposes of Project Certification and Validation as well as carbon credits issuance and their Verification.

Definitions of the various terms used in the Methodology are given in ANNEX 1. LIST OF DEFINITIONS.

The Methodology is intended to be a learning methodology that takes into account, through periodic updates, any improvements resulting from practical application, developments in scientific research and/or any contributions proposed by experts and practitioners of agroecological projects, agroforestry, regenerative agriculture, soil conservation and conservation agriculture approaches.

1.1 Scope of the Methodology

1.1.1 Sector, choice of ecosystem objectives and regenerative activities

In accordance with the provisions of section 7.1.1 of the ORMEX STANDARD, the Methodology is intended for Project Holder[9] in the AFOLU (Agriculture Forestry & Other Land Use) sector whose objective is to mitigate the effects of climate change while implementing the monitoring of Ecosystemic Objectives[10] in relation to Agroecological principles.

The conditions, requirements and modalities established by the Methodology are therefore based on the change from conventional agricultural practices to an agroecological system, including the choice between three (3) levels of Regenerative Activities[11] . The Regenerative

[9] Section 6.1.2 - ORMEX STANDARD

[10] Section 8.6.2 - ORMEX STANDARD

[11] Section 7.2 - ORMEX STANDARD

Activities and the methods for choosing the levels are detailed in Section 2.6.

The Methodology enables the Project Holder to:

- ✓ Report on the achievement of climate benefits and present a Positive Carbon Impact Project[12] .
- ✓ Identify and monitor, in accordance with section 8.6.2 of the ORMEX STANDARD, the achievement of Ecosystemic Objectives grouped into three categories: Environmental Integrity, Biodiversity Maintenance, and Socio-Economic Improvements.

The Methodology therefore details:

- ✓ Project eligibility requirements for the Methodology (Section 2).
- ✓ Project Design requirements, procedures and methods (Section 3).
- ✓ The terms and conditions for assessing the Carbon Impact Quantification for the timeline of the Project and by year, (Section 4).
- ✓ The Project Scenario implementation (Section 5)
- ✓ The recommendations for identifying and managing risks, uncertainty and risks buffer (Section 6).
- ✓ The Project monitoring, reporting and verification (MRV) requirements and procedures (Section 7), including the indicators for monitoring the Ecosystemic Objectives, the methods for monitoring and identifying the Positive Ecosystem Impacts in relation to the associated Sustainable Development Goals (SDGs).
- ✓ The Additionality Demonstration (Section 8)

1.1.2 Segmentation

The Methodology applies to Single, Grouped or Governmental/Regional Projects as specified in section 6.2 of the ORMEX STANDARD.

1.1.3 Past Started and Future Projects

The Methodology is intended to apply to Projects which have already started before the Project Creation Date (referred to as "Past Started Projects"[13]) as well as to any Project which has not yet started but which plans to initiate the submit for Validation within 12 (twelve) months at the Project Creation Date (referred to as "Future Projects"[14]).

[12] Section 8.5 - ORMEX STANDARD

[13] Section 5.2 - ORMEX STANDARD

[14] Section 5.3 - ORMEX STANDARD

1.2 Main sources

In addition to the various sources listed, the Methodology is based on the main tools and methods specified below:

- ✓ ORMEX recognizes the *Nationally Determined Contribution Expert Tool (NEXT, v.*0523), (hereafter referred to as "NEXT") developed by the FAO. This tool is adapted to the quantification of the net balance of GHG emissions/reductions and storages by category of Plantations and applied agricultural practices. It can be used to quantify changes in GHG emissions/reductions and storage associated with the 5 pools specified by the IPCC[15] : below-ground biomass, above-ground biomass, litter, dead wood and soil. Established for the assessment and implementation of national policies in the context of Nationally Determined Contributions (NDCs), this tool can also be applied to any type of Project segmentation.
- ✓ Handbook for the evaluation of agroecology, a method to evaluate its effects and the conditions for its development, GTAE-AgroParisTech CIRAD-IRD, March 2019[16] . This Memento details and proposes a guide for evaluating agroecological systems. together with the list of figures and tables.
- ✓ IPCC. 2019. 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Calvo Buendia, E., Tanabe, K., Kranjc, A., Baasansuren, J., Fukuda, M., Ngarize S., Osako, A., Pyearozhenko, Y., Shermanau, P. and Federici, S. (eds). Published by: IPCC, Switzerland.
- ✓ IPCC. 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands. Hiraishi, T., Krug, T., Tanabe, K., Srivastava, N., Baasansuren, J., Fukuda, M. & Troxler, T.G. (eds). Published by IPCC, Switzerland
- ✓ UNFCCC. 2020. Reference manual for the enhanced transparency framework under the Paris Agreement. Understanding the enhanced transparency framework and its linkages to nationally determined contribution accounting. Bonn.
- ✓ UNFCCC. 2021. Nationally determined contributions under the Paris Agreement, synthesis report by the Secretariat. Bonn. December 2021.

[15] IPCC 2006, revision 2019, Volume 4 Chapter 5.

[16] L. Levard, M. Bertrand, P. Masse (Coordination), Mémento pour l'évaluation de l'agroécologie, Méthodologie pour évaluer ses effets et les conditions de son développement, GTAE-AgroParisTech CIRAD-IRD, March 2019

2 PROJECT ELIGIBILITY

To be qualified for ORMEX Standard Project Certification, the Project must meet the eligibility requirements of this Methodology.

2.1 Eligible agricultural sub-sectors

The Methodology applies to Projects relating to an agricultural production sector.

The Methodology applies to any type of agricultural crop (hereinafter referred to as "Plantations") that falls within the "Cropland" sector specified in section 7.1 of the ORMEX STANDARD and recalled below.

<table>
<tr>
<td>Annual crops
✓ Cereals
✓ Oil seeds
✓ Vegetables
✓ Root crops
✓ Forages</td>
<td>Perennial crops ("except where these lands meet the criteria for categorization as Forest Land")
✓ trees and shrubs, in combination with herbaceous crops (e.g., agroforestry)
✓ Orchards
✓ Vineyards
✓ Plantations such as cocoa, coffee, tea, oil palm, coconut, rubber trees, and bananas.</td>
</tr>
<tr>
<td colspan="2">Including:
✓ "Arable land which is normally used for cultivation of annual crops, but which is temporarily used for forage crops or grazing as part of an annual crop-pasture rotation (mixed system)".
AND
✓ "Temporary fallow land (i.e., land set at rest for one or several years before being cultivated again)".</td>
</tr>
</table>

2.2 Determination of the agri-environmental situation

2.2.1 Location and climate data

The Project must specify its location in a specific climate zone using the following one of the classification tools as proposed by NEXT.

- ✓ By following the classifications of agro-ecological zones (AEZ) determined by the FAO, at national, regional or global level. If the classification is not available for the country concerned, it is possible to use global or regional information[17] .
- ✓ Following the climate zones specified by the IPCC Guidelines, 2006 AFOLU[18] modified in 2009.

NEXT offers a choice of country regionalisation based on the United Nations classifications[19] and climate zone categorisation with reference to the aforementioned IPCC guidelines. By selecting the country in which the practices are to be implemented, the climate zone, soil types and crop types grown in that country are automatically displayed in NEXT. (Section 4.1.2)

2.2.2 Project Boundaries

The leverage targeted by the ORMEX Methodology is linked to the implementation of level 1, 2 and/or 3 Regenerative Activities (Section 2.6) in existing or new Plantations.

2.2.2.1 Existing and new plantations – Land use change

The levers targeted by the Methodology are, within the same Cropping System (Section 3.2):

- ➢ The transformation of an existing Plantation system through the implementation of level 1, 2 or 3 Regenerative Activities (no change in land use), AND/OR
- ➢ The creation of new Plantations following the implementation of level 1, 2 or 3 Regenerative Activities on land that has previously been used for another plantation (change of land use) or on land identified as eligible (e.g., annual cropland set-aside).

The Project includes the identification of the Lever(s) determined.

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[17] The details of global agroecological zones classification outlined by Food and Agricultural Organization of United Nations (FAO), Rome, Italy and International Institute for Applied Systems Analysis, Luxembourg, Austria are available at: http://www.iiasa.ac.at/Research/LUC/GAEZ/index.htm

[18] IPCC Guidelines - climatic regions of 2006 IPCC AFOLU - Volume 3 - Figure 3A.5.1 (Update) page 3.47 Delineation of major climate zones, updated from the 2006 IPCC Guidelines.

[19] NEXT - Technical guide for the Nationally Determined Contribution Expert Tool (NEXT) - Section 2.7- Tables 56 to 59 in the Annex I.

Determining initial land use for "existing" and "new" plantations

A plantation will be considered as "existing" if the agricultural parcel (plot) has been used for agricultural cultivation (the main crop that will be continued as part of the Project) for at least 3 years at the time of the Start Date of the Project. These 3 years may include the year in which the considered Plot is left in temporary grassland in rotation with the agricultural crop). A plantation is considered to be "new" (or the extension of an existing Plantation) when the main crop identified in the Cropping System is applied as an extension to an existing plantation or on an plot previously cultivated for another use or on eligible land.

Eligible areas for new Plantations may be the annual cropland that is undergoing a change in land use, permanent grassland or fallow land with little or no herbaceous cover as well as arable cropland set-aside (tall grass, a few bushes, a few trees and/or shrubs).

It should be noted that the Project Holder must demonstrate that deforestation will not occur and that forest areas will be conserved in accordance with the provisions of Section 3.4

2.2.2.2 Positive Impacts

In any event, the Project must demonstrate, for the areas in question, that it has implemented or intends to implement Regenerative Activities in accordance with the procedures specified in Section 2.6 and fall within one of the levels of objectives detailed Section 2.5 so that these areas can be taken into account in the quantification of the Carbon Impact.

2.2.2.3 Exclusion

- ✓ Although hedges and shrubs are taken into account in the Regenerative Activities, they are not taken into account in the Carbon Quantification (Hedgerow Methodology which may be complementary).
- ✓ Although Hedgerows[20] crops is taken into account when carrying out level 3 Regenerative Activities, it is not taken into account in the Carbon Quantification.
- ✓ The upstream and downstream activities (indirect levers) required to achieve production are not considered in this Methodology (The Leakage is not taken into account in this version of methodology).

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[20] Refers to "*linear plantation around the fields, including shelterbelts, windbreaks and live fences*". (Rémi Cardinael et al 2018, Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems (Environ. Res. Lett. 13 124020)

2.2.3 Planting constraints

2.2.3.1 Perennial crops (e.g., Orchards)

The plantation must be sufficiently spaced to allow for the growth of the different types of trees and the need for intercropping and cover crops.

Planting density may not be less than 100 trees/ha and a spacing of at least 10 metres on the row and 10 metres between rows is required.

2.2.3.2 Annual field crops planting

For annual field crops, the constraint is to always plant in rotation and/or crops diversification and move away from monocultures that deplete the soils.

2.3 Determination of the operational zone

Considering the Positive Impacts to be monitored, the operational zone and the spatial boundaries have to be defined by the Project Holder considering the following principles. The operational zone is not defined in the same way for a Single, Grouped and/or Governmental/Regional Projects.

2.3.1 Agroecosystem principles

The Project must determine an agroecosystem. The agroecosystem is a functionally and spatially coherent whole, including its living and non-living components and their interactions[21] . This determination makes it possible to define the spatial and functional boundaries for monitoring the Project's performance.

According to the definitions of INRAE[22] , first or second agroecosystems levels can be identified depending on the follow analysis:

2.3.1.1 First-level agroecosystem

The first-level agroecosystem goes beyond the basic agricultural productive unit, which is the plot, to encompass an "agroecological landscape unit" (Papy et al, 2023). From an agricultural point of view, a cropping system covers a set of technical methods implemented on plots treated in an identical way, and is defined by the nature of the crops, their order of succession and the technical itineraries applied. This classic definition of a cropping system

[21] Agro-ecosystem Health Project. Agroecosystem health. University of Guelph, Guelph, Canada, 1996.

[22] François Papy, Gilles Lemaire and Éric Malézieux, Agrosystème, agroécosystème - Les Mots de l'agronomie (inrae.fr), article updated March 2023

has been broadened to include a spatial and environmental concept that makes it possible to assess not only the nature of the crops, cropping practices and technical itineraries, but also the spatial continuity of the ecological processes required to understand an agro-ecological system on the scale of a farm and beyond (Papy et al, 2023).

The Single Projects and the closed Grouped Projects will be applied this wider perspective of the Cropping System that will determine the agroecological landscape unit constituting their functional and spatial boundaries (Sections 3.2.1.1 and 3.2.2.1).

2.3.1.2 Second-level agroecosystem

As part of a broader, territorial approach to the agroecosystem, a second-level agroecosystem emerges (Papy et al, 2023). A second-level agroecosystem (Figure 1) is defined as "*a systemic representation of the way in which, on a portion of space to be defined according to a hierarchy between environmental and productive objectives, the stakeholders of a territory implement rules of action to achieve these objectives and use their knowledge of the processes to analyse the effect of disturbances introduced and to design other technical systems*". (Papy et al., 2023).

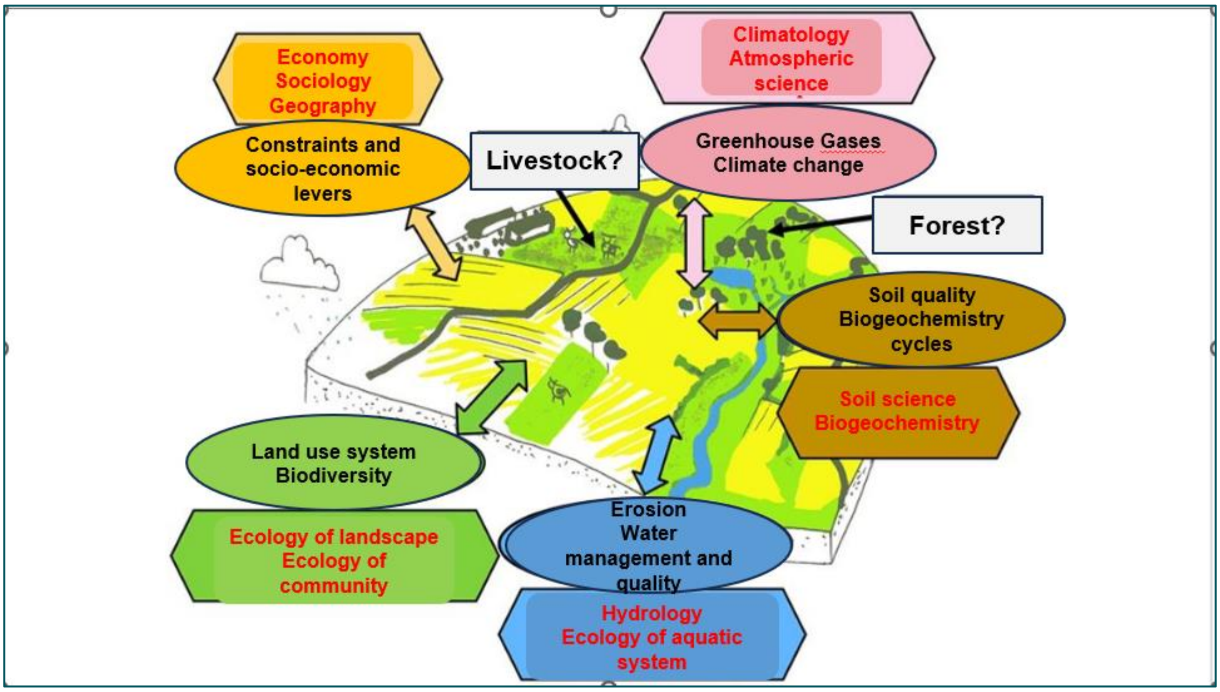


Figure 1 - Papy et al. 2023, Illustration of the diversity of processes involved in the environmental services expected from agriculture, making it possible to consider second-order agroecosystems as assemblages of first-order agroecosystems - Figure 3 (English translation)

This level involves organising first-level agroecosystems spatially in order to understand the multifunctional nature of agriculture. This implies an unprecedented conceptual and decision-making leap, leading to choices in the planification and design of this territory (plot size, nature of field margins, etc.), the preservation of biodiversity and the various flows (in particular water and gas), the redesign of technical itineraries and cropping systems, and above all arbitration between multiple objectives and between numerous stakeholders (Papy et al., 2023).

It is currently difficult to use a second-level agroecosystems, because each agroecosystem is different. It is defined on a case-by-case basis. The Methodology offers a first step in modelling, by enabling first-level agroecosystem projects, each with a level of homogeneity that characterises a cropping system, to form part of a territorial approach, and to share common objectives for ecosystem services assessed at a defined scale.

The closed[23] and open Grouped Projects, and the Government/Regional Projects, will apply this approach. The Sections 3.2.2.2 and 3.2.3 identify how these Projects will determine the appropriate functional and spatial zoning, identified as an "Agrarian System".[24]

2.3.2 Minimum area of the operational zone for a Single Project and closed Grouped Projects

The Methodology does not impose any minimum surface area, nor any obligation with regard to the layout of the plots (contiguous or non-contiguous plots). However, the Project must identify the various stakeholders who will enable consultation and the sharing of knowledge with regard to the Ecosystem Objectives chosen, and in line with the Cropping System.

Areas associated with existing Agroecological Infrastructure (AEI) (in place or to be developed) can be identified at but are not considered when determining areas for the calculation of Carbon Quantification.

2.3.3 Minimum area of the operational zone for an open Grouped Projects and Government/Regional Projects

An identified Cropping System must represent a combined area of more than 1,000 ha (and in tropical zones a minimum of 100 ha), thereby encouraging synergy between the farming sector and an ecosystem-based approach to the territorial structure envisaged, based on common, shared practices.

The project must therefore demonstrate a concerted and coherent approach on the territorial scale envisaged, and the implementation of consultation and knowledge-sharing tools.

[23] The closed Grouped Project can choose between a single Cropping System or define several.

2.4 Positive Carbon Impact

The Project Holder must demonstrate a Positive Carbon Impact leading to a net increase in carbon storage on the scale of the eligible Surfaces in the agroecosystem considered and a reduction in greenhouse gases (for certain projects).

The Carbon impact is positive when the carbon stock is quantified and makes it possible to estimate a net increase in carbon removal, which would not have occurred in the Reference Scenario in the absence of the Project implementation.

The Project must estimate the carbon balance using the NEXT tool in accordance with the procedures specified in Section 4.

2.5 Positive Ecosystemic Co-benefits

The ORMEX Standard requires the choice of Ecosystem Co-benefits at the Project design stage, grouped into three categories (Environmental Integrity, Biodiversity Maintenance and Social and Economic Improvements), and identifies the co-benefits that considered mandatory to be followed by all Project Holders[25] . This choice determines the scope of the Project's monitoring by following and setting the indicators that nurture the criteria defined in the SDGs targets.

The imperative Ecosystemic Co-benefits chosen in accordance with the provisions of section 7.3 of the ORMEX STANDARD determine the scope of the Project's monitoring by following the indicators for monitoring the defined criteria of the SDGs Targets.

[25] Section 7.3 - ORMEX STANDARD

Figure 2 - pre-qualified mandatory Eco-systemic co-benefits in ORMEX Platform

Eco-systemic co-benefits are identified by grouping together coherent objectives.

The Figure 2 elaborated on GTAE's evaluation criteria liked to SDGs (Figure 3) details the links between the Co-benefits and the associated SDGs targets. Each colour corresponds to a particular SDG. By clicking on the coloured point[26], a Project Holder can view the name of the SDG target, the associated criteria and the indicators to be followed.

[26] For the optional Co-benefits, the Project Holder needs to check first the Co-benefit, to view the associated criteria and indicators for the related SDG Target.

EVALUATION CRITERION	1 Eradicate extreme poverty and hunger	2 Eradicate hunger, ensure food security, improve nutrition and promote sustainable agriculture	3 Ensure healthy lives and promote the well-being of all at all ages	4 Ensure access for all to quality, equitable education and promote learning possibilities...	5 Achieve gender equality and empower all women and girls	6 Ensure access for all to water and sanitation and ensure sustainable management of water resources	8 Promote inclusive and sustainable economic growth, full productive employment	9 Build resilient infrastructure, promote sustainable industrialisation for the benefit of all and foster innovation	12 Establish sustainable consumption and production patterns	13 Take urgent action to combat climate change and its impacts	15 Conserve and restore terrestrial ecosystems, ensuring they are used sustainably
Direct measurement of yield and of yield regularity	■	■									
Evaluation of soil health		■							■	■	■
Mitigation of GHG emissions										■	■
Efficiency of use of water resources and nutrients		■				■					
Effectiveness of pest and disease regulation	■	■									
Agricultural yields according to stakeholders	■	■									
Economic Performance from the farmer's point of view	■	■									
Performance from the overall national interest point of view							■				
Appeal of agriculture for young people							■				
Value chains and Trade Organisations		■					■	■			
Autonomy							■				
Empowerment of women	■	■		■	■	■	■				
Employment and well-being							■				
Food and nutrition security		■									

Figure 3 -(L. Levard et al., 2019)[27]

For Project Certification, the Project Holder must provide evidence of the implementation of actions to monitor the chosen Ecosystemic Objectives.

Throughout the monitoring of the Project, it must provide the initial values to be monitored (as a minimum condition for the past periods at the Project Creation), the evidence of the measurement of the indicators (for the future periods), as well as a monitoring plan with clearly identified accountable counterparts.

The major goal of the indicators is that their initial value is enhanced during the Project Timeline. Nevertheless, if some of these indicators are decreased in a particular year, a clear action plan must be put in place to enhance this indicator during the next verification period.

2.6 Implementation of Regenerative Activities

2.6.1 General

The Project Holder must choose between the three levels of Regenerative Activities (level 1, 2 or 3) defined below, the level that must be implemented for a Cropping System within the framework of the Project and for the Project timeline.

To define the level of the Regenerative Activities, the Project Holder must take in consideration conventional as well as traditional practices, and make sure that the regenerative practices are realistically feasible on the ground (or, in the context of the Grouped Project, by the farmers) and that they can realistically be implemented.

If the Project Holder identifies several levels of desired Regenerative Activities, it must define a Cropping System associated with each level chosen. Each Cropping System is identified as a specific Project Scenario ("Scenario") for the purposes of carbon quantification.

Each Scenario is identified by a reference (e.g., AGL-1), which can be followed between different panels of the tool for ease of understanding of the information and its source.

Each Scenario has a set of **minimum** Regenerative Activities which must be implemented.

The Project can reference an existing technical pathway by demonstrating its suitability for Practices responding to the various sub-themes summarised in Section 2.6.2.

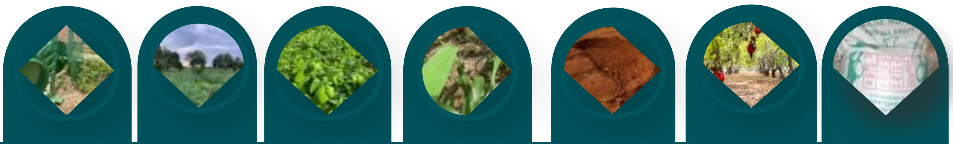
2.6.2 Choice of Agroecology level

Agroecology Level 1 is the minimum level required for a Project willing to apply for ORMEX Certification. The main condition requires to install crops rotations /diversification, start implementation cover-crops to regenerate the soils, stop burning residues activity, reduce

[27] L. Levard, B. Mathieu, P. Masse (Coordination), Handbook for the evaluation of agroecology, A method to evaluate its effects and the conditions for its development, GTAE-AgroParisTech CIRAD-IRD, March 2019

tilling (if tilling is used) and reduce Nitrogen fertilizers (if those are used) by half progressively until the Target year[28].

Regenerative Activities by Level



	Soil Mgt	Crops diversification & rotation	Cover crops, Inter-cropping	Mulching & Half-moons	Retained Residues	Agro-forestery	Fertilizers
Conventional Level (Low Soil Inputs)*	Tilling	✘	✘	✘	✘	✘	Chemical N-fertilizers
Agroecology Level 1 (Medium Soil Inputs)*	Reduced-Tilling (strip-till)	✔	✔	✔	✘	✘	Reduced N-Fertlizers (50%)
Agroecology Level 2 (High Soil Inputs without manure)*	Direct sowing	✔	✔	✔	✔	✔	Organic Fertilizers
Agroecology Level 3 (High Soil Inputs with manure)*	Semis direct		Level 2 + Manure + Pollenisation				+ Manure

Figure 4 -Summary of Agroecology Levels

The Section 4 details the scenario to be implemented in the NEXT calculation tool to determine the Carbon Quantification eq. taking into account the surface progressive implementation.

During the Verification Phases, the Project Holder is asked to justify the surface areas specific to each Cropping System and the Regenerative Activities implemented.

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[28] In the tropical countries and for some of the crops (e.g., Coton) a minimum of Nitrogen is still required. This minimum was determined by INRA specialists as 50 kg per hectare. In the case of a Project Holder located in Tropical countries and using nitrogen within this minimum amount, then a reduction of this fertilizer is not required. The only reduction accepted is to the level of 50kg per hectare as a minimum for the Levels 1 & 2.

3 PROJECT DESIGN CONDITIONS

The Project Holder draws up a document called PDD (Project Design Description), describing the design of the Project. The PDD must be drawn up in accordance with the provisions of the Methodology and in compliance with the ORMEX standard.

By drawing up and signing the PDD document, the Project Holder declares that he is capable of developing and respecting the implementation and monitoring conditions specified in the Methodology and undertakes to respect them for the duration of the Project.

Depending on the choice of Eco-systemic Co-benefits, the PDD must specify Project Monitoring Indicators in line with the objectives of the co-benefit monitored. Monitoring Indicators are specified in ANNEX 3. INDICATORS FOR ECOSYSTEMIC CO-BENEFITS. During the Verification Phases, the results obtained following the calculations or findings made, as well as the sources and evidence associated with these results, will be made available to the VVB for verification.

The Project Holder undertakes to answer the various questions asked by the VVB during the Validation and Verification phases. In the event of non-compliance identified by the VVB, the Project Holder must modify the design of the Project if he wishes to continue the Project within the framework of the Methodology.

This Section 3 describes the elements that must be taken into account by the Project Holder in order to design the Project and then describe it precisely in the PDD.

Firstly, the Project Holder must identify the Project Start Date, enabling it to determine the Timeline of the Project and the Crediting Period[29] (Section 3.1).

It must then categorise the Project agroecosystem and determine the Cropping System(s) (Section 3.2). The Section 7.2.2 specifies the categorisation and how identify the components.

3.1 Project start date and timeline

3.1.1 Project Timeline

The Methodology applies to Projects with a timeline of at least 20 calendar years (and a maximum of 30 calendar years) during which the Project Holder is committed to pursuing the Regenerative Activities. This period applies regardless of the crop, tropical climate, soil fertility or existing technical itinerary. The implementation period as defined in Section 3.1.2 is not included in the Project Timeline.

[29] Sections 5.2.1 and 5.3.1 - ORMEX STANDARD

For example, a Project registers on the ORMEX Platform during the year 2023: Following the process specified in the ORMEX STANDARD, the Creation Date is notified during the year 2023. The Project Holder demonstrates the start of the Project occurring during the year 2023. The years 2023 and the Year after 2024 are Implementation calendar years. The Project Timeline starts with the year 2024 and terminates on December 31st 2053 (End Date). The Crediting Period will consider the 29 calendar years, from 2025 to 2053 included.

3.1.2 Project Start Date

In accordance with the ORMEX STANDARD, it is important that the Project Start Date can be identified[30] . This date determines the start year. The start year and the and the following calendar year are designated as the " implementation" " years. This start year is not taken into account when calculating the Project Timeline (Section 3.1.1). The implementation years are not counted on the Crediting Period.

The Project Start Date identifies the year in which the first major step or steps required to implement the Regenerative Activities are completed.

For Past Started or Future Projects, the date of the first major step(s) in the transition to the implementation of Regenerative Activities (Level 1, 2 or 3) is assessed for each Cropping System.

The events that can be identified as major stages in the implementation are specified in Section 8.2.1 of the ORMEX STANDARD, and are further detailed in this Section.

The Project Holder must demonstrate:

- For **Future Projects**: that during the implementation year, it has initiated one (or more) major step(s) to obtain the structural resources needed to carry out one or more of the Regenerative Activities identified in the PDD, in order to implement these resources during the next cropping season on all the Plots in the Cropping System.
- For **Past Started Projects**: that a major stage in obtaining the structural resources needed to carry out one or more of the Regenerative Activities identified in the *PDD* was initiated during the implementation year in question.

A major step could be (non-exhaustive list):

- ✓ The date of purchase (or disposal) of the plants/seeds required for the crop combinations and the rotation system, OR
- ✓ Completion of the cropping season by implementing Regenerative Activities on all the Plots in the Cropping System. This assumes that the major stages were completed

[30] Section 8.2 - ORMEX STANDARD

the previous year, OR

- ✓ Carrying out at least one of the Regenerative Activities on at least half of the Plots in the Cropping System.
- ✓ The purchase or provision of specific equipment and tools (such as strip-tills, light stubble cultivators, etc.), OR
- ✓ Demonstration of a reduction in the use (to at least 50%) or absence of use of mineral fertiliser on the plots in the Cropping System, OR
- ✓ The date of the start of a field study campaign relating to soil health: collection of data on soil health and/or a SOC study on plots, OR
- ✓ On the date of the Stakeholder Consultation, OR
- ✓ At the date of the observation that at least 2% of the estimated Surfaces of each Cropping System of the agroecosystem have started the implementation of one of the Regenerative Activities (applicable only for open Grouped Project and Government/Regional Projects).

A major step can be demonstrated by any type of document. The completion of a practice activity may correspond to the start of the technical itinerary (preparation of the land, mulching, moons, half-moons, etc.).

3.2 Characterisation of agroecosystems according to the Project segmentation

As indicated in Section 2.3.1 depending on the level of segmentation of the Project (Single Project, Grouped Project or Government/Regional Project), the assessment of the characteristics of the agroecosystem defining the perimeter of the Project, its components and the variables used to categorise it are not the same.

This Section 3.2 details the level of appreciation of the agroecosystem according to the Project's segmentation.

3.2.1 The agroecosystem of Single Projects

3.2.1.1 System identification and spatial determination

The landscape unit of a first-level agroecosystem is made up of neighbouring plots and landscape structures. Within this landscape unit, the farmer manages the ecosystem self-regulations that develop there, for essentially productive purposes, and analyses the disturbances that he has introduced, in order to design other technical systems. The Single Project Holder must therefore identify at least one Cropping System within this landscape unit.

This section, supplemented by Section 7 details how the Cropping System components may be identified by the Project Holder and which will make it possible to constitute the scope of analysis and monitoring of the agroecosystem of the Single Project. Within this scope, the Project Holder will identify the Plots that correspond to the selected Cropping System. It is within this homogeneous perimeter that identical actions will be carried out and Indicators will be monitored.

Remember that a Project designated as "Single" by the ORMEX Standard is characterised by one or more Plots whose management and implementation of Regenerative Activities are the responsibility of a single stakeholder[31] . The Plots identified must therefore belong to the same farm or be managed autonomously by the Farmer, as decisions relating to this Cropping System are taken at this level, particularly in the context of essentially family farming.

In order to characterise the Cropping System, the Project Holder must position himself for each component on the different variables proposed. The Plots eligible for the Cropping System must correspond to these variables. They must therefore identify the Plots attached to their farm that can be taken into account in this system and monitor the Indicators for the agroecosystem thus constituted.

The Single Project must involve one or more Plots within the same Cropping System identified by the Project Holder within the agroecosystem. Plots that do not respond in a homogeneous way to the variables of the components identified for the Cropping System are not taken into account in the perimeter of this system.

However, the Project Holder may identify several cropping systems as part of its Project. Each Cropping System must be characterised according to the methodology proposed below. In this case, the balances of Positive Impacts are identified by Cropping System, and then globally.

The Methodology also allows the Project Holder to identify elements outside the agro-ecosystem that interact with the Cropping System (such as a community storage area).

The Project Holder identifies the Cropping System of the Project taking into account main components. Components examples are proposed in in Section 7.

From the date of Certification of the Project, the Cropping System is analysed each year (each cropping season) by the Farmer in order to identify any clarifications that can be made and any changes that need to be made. The Cropping System must remain homogeneous in the evolution of its components.

[31] Section 6.2.1 - ORMEX STANDARD

3.2.2 The agroecosystem of Grouped Projects

According to the ORMEX Standard, projects are considered to be "grouped projects" when they are initiated by more than one participant in the project[32] (for example, several farmers decide to act jointly and/or participate in a common project), regardless of the legal form of their collaboration.

Grouped Projects may be open or closed. The Project is designated as "closed" when the number and designation of the farmers participating in the Project is known on the day the Project is launched. A Grouped Project is designated as "open" when it is identified that the Project may welcome new participants at any time, provided that they meet the conditions and entry criteria detailed in the PDD.

The ORMEX Standard requires uniformity of implementation. This section sets out how the Project's agroecosystem is categorised, depending on whether the Project is a closed Grouped Project or an open Grouped Project.

3.2.2.1 Typology methodology for a closed Group project

For closed Grouped Projects, it is important to group together one or more homogeneous agroecosystems. This corresponds to the grouping of homogeneous farms responding to an identified Cropping System. However, depending on the number of participants, it may be difficult to satisfy this demand for homogeneity given the diversity of the systems, while at the same time considering that it is important for each situation to be represented. Furthermore, as the methodology is a framework method, the components and/or variables proposed may not be representative of the different agrarian systems that are representative of the geographical area where the farms are located. In this case, the Project Holder is invited to add components and/or modify the variables proposed so that they can be representative in a relevant way.

Closed Grouped Projects can therefore be:

- ✓ Add components (and the associated variable(s)) not proposed by the Framework Methodology (Section 7.2.2), whose relevance to the agrarian system specific to the location of the Project and the Cropping System envisaged can be demonstrated;
- ✓ To decide on relevant variables for the Cropping System components;
- ✓ Define a single Cropping System, taking into account the same components as for a Single Project, and determine a single Cropping System (Section 3.2.1). Only farms conforming to the identified Cropping System will be eligible for the Project. The single Cropping System is recommended for small-scale projects (less than 20 participating farms), for example where farms in a village share similar situations and

[32] Section 6.2.2 - ORMEX STANDARD

environment. If a limited number of farms do not meet certain variables, it is possible to modify these variables by simplifying them. For example, of the 10 Farmers wishing to participate in the Closed Group Project, 2 of the farms do not comply with the average Plot size as identified in the Cropping System. It is therefore possible to replace the associated variables by grouping them as required. For example, the "<3 ha" variable and the "≤ 3 ha ≤10 ha" variable can be grouped together to become ≤10 ha. The Project may also decide to follow the procedure for categorising several Cropping Systems according to the method proposed for large-scale closed Group Projects, particularly if the group wishes to have a more refined level of representation or to take into account a greater variety of farms.

- ✓ To choose to follow a categorisation format for the different Cropping Systems in order to have more specific monitoring of each system identified and to appreciate the different evolutions. This option should be used in the context of a large-scale Project involving more than 20 participating farms. It is recommended to limit the number of Cropping Systems in the Project to a maximum of 5, making use of the possibility of grouping certain variables in a relevant manner on the basis of the results obtained.

3.2.2.2 Typology Methodology for an open Grouped Project

In order to satisfy the homogenisation constraint, an open Grouped Project determines a single Cropping System for the Project, using the same method as the closed Grouped Project, i.e., with the possibility of adding components and modifying variables adapted to the agrarian system concerned by the Project.

3.2.3 The agroecosystem of Government/Regional Projects

Governmental/Regional Projects are on a national or regional scale, taking into account all or part of a national territory.

According to the ORMEX Standard[33] , a Government/Regional Project is linked to one or more political initiatives to encourage the implementation of agroecological and regenerative practices in all or part of the territory, enabling Farmers to participate on a voluntary basis within a framework organised and supported by public institutions. Farmers wishing to take part in the project have to comply to the Cropping Systems and the conditions determined by the Project Holder for the participation to the Project.

The need to share common objectives in terms of food resilience and sustainability, as well as the need to coordinate the chain of players required to implement this type of Project on a national or regional scale, means that an agroecosystem must be characterised by

[33] Section 6.2.3 - ORMEX STANDARD

following an Agricultural Sector and by determining a geographically coherent system that is dynamically homogenous in environmental and social-economic terms with regard to each part of the territory concerned by the Project. This element of coherence is provided by the agrarian system ("the Agrarian System")[34].

The methodology used to determine the Agrarian System(s) is based on the agrarian system diagnostic study adapted to the agroecology assessment methodology proposed by the GTAE (L. Levard, et al, 2019).

The determination of the minimum components to be taken into account for the categorisation of the Cropping System(s) making up the Project's Agrarian System, their variables and the procedure for categorising the farms participating in it, makes it possible to define the implementation, data collection and sampling method (example: reasoned sampling of farms at the level of the agro-socio-economic zoning determined). The relevant agro-socio-economic zoning must first be determined.

State or regional public organisations already have a great deal of data relating to an agricultural sector, the different Agrarian Systems present in its territory, and specific local features. It can therefore determine representative agro-social-economic zonings present on a territorial scale (such as agricultural development zones determined on agro-climatic and territorial bases) which it wishes to use as the perimeter of the Project and analysis of the desired Agrarian System. If this is the case, this zoning must be used and specified.

In this way, the farms in the Agricultural Sector concerned by the Project will have to be attached to the determined Agrarian System, then to Cropping Systems (identified here as a sub-systems) characteristic of a relevant geographical/administrative sub-area, established in a coherent manner with regard to the typologies of the agroecosystems of this territory. A Land administrative community may appear to be a relevant scale.

Within each territorial zone thus considered, the Project Holder uses the typology of farms that it has determined on an agro-socio-economic basis, which must be composed of components and choices of variables relevant to the Agrarian System.

The Framework Methodology cannot model a list of components and variables that are relevant to all farming systems throughout the world and consistent with the zoning identified by the Project Holder. The Section 7 proposes a list of components that may be analysed by the Project.

The typology has to be specified by the Project Holder for the monitoring of the Ecosystemic Objectives Indicators. For Past Started Projects, this categorisation cannot apply. The Project

[34] L.Bockel, F.Tallec, L'approche filière : Analyse fonctionnelle et identification des flux, FAO, 2005, published EASYPol

Holder may implement the first categorisation for the Verification of future Vintage Periods following the Certification.

If the Project Holder already has a typology or grouping model in place with a set of criteria established in a relevant manner with regard to the situation of the Agrarian System, it is recommended that this categorisation be used and completed if necessary.

3.3 The determination of the surface area

3.3.1 General

Following the categorisation of the Cropping System(s) according to the Project segmentation (Section 3.2), the Areas are allocated to each system concerned.

The Project Holder must provide evidence that a design phase has been carried out that takes into account an eco-systematic approach, and the non-degradation and enrichment of the existing environment (Section 3.40). This can be demonstrated by the implementation of a voluntary regional or national program based on these assumptions in the Operational zone.

In any event, the Project must indicate the methods used to delimit the eligible Surfaces.

The same surface determination methodology must be used to determine the Reference Scenario Surfaces and the Project Scenario Surfaces.

3.3.2 Determining the Surface areas of Single Projects and closed Grouped Projects

The surface areas of single and closed grouped Projects do not change during the life of the Project.

3.3.3 Determining the Surface areas of open Grouped Projects and Government/Regional Projects

The PDD must detail for each year and for each Lever, the overall Surface area (ha) of the Plots of land of the farms that have started Regenerative Activities, as well as the estimated plan for the evolution of these surfaces during the deployment of the Project. The assumptions used to determine this planning and the associated risks will be specified. Any identified risks must be dealt with as part of the risk management plan specified in Section 6.

For Past Started Projects, data on deployments (ha) carried out for past periods eligible under the Methodology will be provided.

This planning must be reviewed each year as part of the Project Monitoring referred to in Section 7.

3.3.4 Data source

The Project Holder can determine the overall Surface area of a Cropping System or Agrarian System by using a data source:

- ✓ Established at national or regional level, OR
- ✓ an administrative enquiry involving documents justifying the areas farmed, OR
- ✓ a cadastral database, OR
- ✓ a satellite imaging source for identifying Surfaces, OR
- ✓ In the absence of such an administrative database, the Project Holder may use farming area data provided by the Farmer himself, by a third party or based on measurements carried out in the field that are collected less than 1 year.

The Project Holder indicates the source of the data and the associated dates.

3.4 No degradation of the pre-existing ecosystem

According to the FAO's 2022 report on the world forest[35], more than 90% of the world's deforestation is due to a change in land use for agricultural purposes. There are many reasons for deforestation, depending on the location, but deforestation is mainly the result of the pressure of competition for land (urbanisation and artificialisation in industrial countries, and the pressure of production needs due to population growth in developing countries, or the use of itinerant burning practices that no longer allow natural soil regeneration). These situations lead farmers to deforest in order to expand their production.

According to the ORMEX Standard[36] , the Project Holder must specify 1) the history of use of the areas affected by the Project and 2) the potential effects of degradation on the Project's natural areas. Only point 1) is used to categorise the Cropping System.

3.4.1 Procedures for determining the land use history for a Single or closed Group Project

The Project Holder indicates the history(s) of use of the Plots by Cropping System. This land use history requirement concerns only the Plots of the Cropping System(s), and not the entire agroecosystem of the Project.

It determines:

a. Plots with an agricultural history (one or more of the crops listed in Section 2.1 and/or livestock farming) for at least 10 years as of the Project Creation Date, and the

[35] FAO. 2022. The State of the World's Forests 2022. Forestry solutions for a green recovery and inclusive, resilient and sustainable economies. Rome, FAO. https://doi.org/10.4060/cb9360fr

[36] Section 7.4 - ORMEX STANDARD

associated total surface area.

It should be noted that any damage resulting from natural disasters does not affect this agricultural history. For example, if the land was put to agricultural use after a natural disaster (flood, fire) that occurred during the 10-year period, the agricultural history remains established.

b. Plots with a history of forestry or wetlands (peat bogs, mangroves, primary forests and marshes) during the 10 years preceding the Project Creation Date of the Project, and the associated overall surface area. A deforestation event (not caused by natural disasters) occurred during these 10 years.

c. Parcels that have a different history (e.g., fallow land) in the last 10 years.

Once the information has been identified, the following consequences will apply to the Single and closed Grouped Project:

Situations	Effects
Surface area of plots under majority agricultural land use history Most of the Project is part of a farming continuity, with the main crop being maintained (existing Plots) or crops being changed (new Plots) (Section 2.2.2.1).	The areas of existing Agroecological Structures adjacent to the Plots must be identified (diagnosis of the Cropping System), maintained and protected for the timeline of the Project.
Area of land **under Forest and/or wetland cover**	The Project Holder shall identify the surface area of the Agroecological Structures on its farm, including those that do not adjoin the Plots. These structures must be maintained and protected for the timeline of the Project.
Surface area of Parcels **under historical use other than main use** (e.g., fallow land, severely degraded land, desert land) The project is part of the ongoing rehabilitation of severely degraded land.	The Project Holder will identify the surfaces of the Agroecological Structures of its farm, including those that do not adjoin the Plots.

3.4.2 Procedures for determining land use history for an open Grouped Project

For an open Grouped Project, the Project Holder must:

a. Include the same information requirements and effects of a), b) and c) as for a closed Grouped Project, in order to impose them on participants as an information requirement when they join the Project, AND

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b. Specify the average rate (%) of deforestation in the geographical area covering the Project's agroecosystem.

3.4.3 Procedures for determining land use history for a Governmental/Regional Project

For a Governmental Regional Project, the Project Holder must:

a. Specify the average rate (%) of deforestation in the geographical area covering the Project's agroecosystem.

The Section 4.2 details how to identify the deforestation rate and the related effects on the Carbon Quantification.

3.4.4 Safeguard: No deterioration of Forest areas and Agroecological Structures

The Projects must not be built on the basis of a degradation of the pre-existing ecosystem, particularly Forest, wetland ecosystems and Agricultural Structures, but must lead to its enrichment and improvement.

Any risk on degradation (including natural disaster risks) of the pre-existing ecosystem must be strictly identified within the risks management table (Section 6).

4 CARBON IMPACT QUANTIFIACTION

To calculate the final sellable carbon credits for each vintage, ORMEX Methodology regroups a set of tools & calculations, in order to provide the best-in-class, integrated approach.

The Carbon Impact quantification is done using:

1) The Carbon removal & reduction quantification tool of FAO, called NEXT, which states the basis for the tons of CO2e to be considered for the Project timeline. For the National/Regional Projects, Project Holders[37] must apply a deforestation rate of ten 10 years on the 1st year of surfaces, to exclude any deforestation-based surfaces from the calculation of carbon credits at the beginning of the project.
2) Then an Uncertainty Rate and Risk Buffer Rates is applied (not part of FAO Next tool), according to ORMEX Methodology.

[37] The deforestation rate is only applicable to Governmental/Regional Projects

4.1 Carbon removal & reduction quantification

4.1.1 Use of a quantification tool FAO-NEXT[38]

To quantify the carbon impact of a project, ORMEX recognizes the carbon quantification tool NEXT, developed by the Food and Agriculture Organization (FAO) of the United Nations starting from its version cc0568, 2022.

For carbon projects to be Certified and Carbon Credits issued within ORMEX Standard, Project Holders are required to use this tool for carbon removal and GHG emissions/ reduction quantification.

This tool was designed for AFOLU sector, and within this version of the Methodology, the scope of use of this tool is limited to "Crops & Grass Fields" (including rice) sectors as well as nutrients quantification.

NEXT is a land-based accounting system, measuring annual carbon stock changes per unit of land (in hectare) and methane (CH4) and nitrous oxide (N2O) emissions, expressed in tonne of carbon dioxide equivalent per year, tCO2-e/yr, over a 30-years' time series. NEXT provides the estimation of climate mitigation potential of strategies against a reference scenario.[39]

The 30-years' time-series of results per gas, activities, and per carbon pool allows an understanding of the impact of past, current, and future climate actions and can guide the necessary actions for all Project Holders and especially those at National level, to meet their climate targets.

NEXT has been developed using the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories 2006 (IPCC, 2006), the 2013 Supplement to the 2006 IPCC (IPCC, 2013), and the Refinement to the 2006 IPCC (IPCC, 2019). The tool offers the possibility to use the IPCC 2006 complemented with IPCC 2013, or the IPCC 2019 complemented with IPCC 2013.

For the projects certified by ORMEX Standard, the use of the methodology "IPCC 2019 Refinement & IPCC 2013" is required.

NEXT automatically integrated the Tier 1 parameters, set by IPCC and which are required at a minimum for each scenario calculation. To increase the accuracy level of carbon credits, ORMEX asks Project Holders to use as much as possible Tier 2 parameters concretely related to their Plot, local region and/or Country. This requires soil samplings to be made at the start

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[38] Nationally Determined Contribution Expert Tool (NEXT)

[39] FAO, Technical Guide for the Nationally Determined Expert Tool (NEXT), ttps://www.fao.org/documents/card/fr?details=cc0568en/

of the Project, and performed during the project lifecycle, research analysis on soil health, real yield parameters and real crop types to be used in the calculator.

The following sections indicate the choices to be made when using NEXT by the Project Holder to adjust the Carbon Quantification to the Methodology. The Project Holder must detail its choices.

NEXT allows users to assess the impact of climate actions against a hypothetical reference scenario. In NEXT's terminology, climate action is defined as the Target Scenario (or Project Scenario), while the hypothetical scenario is the Reference (or the Baseline) scenario.

The **Reference scenario** in the context of low carbon development, refers to scenarios based on the assumptions that no mitigation policies or measures will be implemented beyond those already in force or planned to be adopted. The Reference scenario is not a prediction of the future, but rather a counterfactual projection based on information retained as indicative of what the level of emissions could be without any mitigation policy. The term "reference scenario" can be used interchangeably with baseline scenario, BAU scenario or no policy scenario.

Once Project Holders have provided a set of basic information per scenario, which is the area, the start and end of the climate action, and the land management practices (describes further, NEXT will estimate the annual and cumulated GHG fluxes and carbon stock changes from the transition to the initial land-use or management practices to the final land-use or management practices, including changes in GHG fluxes and carbon stocks that will keep occurring after the end of the climate action. These potential changes in GHG emissions reductions, or **balance**, are defined as the difference between the gross fluxes from the target and those from the reference.

Within ORMEX Methodology, this balance is reported as the final Gross Quantify of Carbon separated into carbon removal & carbon reduction potential on an annual basis and constitutes the basis for the carbon credits calculation per vintage.

4.1.2 General data parameters

NEXT is an excel-based model developed according to the IPCC methodologies and tailored with national key parameters for the estimation of national GHG emissions, such as the climate, soils, ecological zones, and crops and livestock categories, as reported in FAOSTAT (FAO, 2021).

➢ Description of the "Home" Menu

In the "Home" menu, Project Holders select key parameters, as:

- their Country Name,
- the Start year of their Project, the Timeline of their Project,
- the main methodologies as "IPCC219 Refinement & IPCC 2013",

- the Global Warming Potential as "AR5 with or without climate carbon feedback".

Basing on these parameters, the "*Share of major soil categories*" is automatically generated.

The Methodology requires the scenarios to be calculated by Climate Type and Soil category. If one of the soil categories represents a net majority type (more than 75% of the covered land), in this case only 1 set of climate type and soil type may be used for the Project.

- **IPCC Climate Regions & FAO Agroecology Zones accepted.**

The national climate domains and agroecological zones (AEZ) are automatically proposed in the tool. ORMEX Methodology considered projects as eligible for all Climate Regions, as defined by IPCC:

- Tropical: Wet, Moist, Dry, Montane
- Sub-Tropical: Warm temperate moist; Warm temperate dry; Warm temperate moist or dry;
- Temperate: Cool temperate moist, Cool temperate dry, Cool temperate moist or dry;
- Boreal: Dry, Moist o dry;
- and Polar: Moist or dry,

as well as all AEZs as they are defined by FAO.[40]

- **IPCC & HWSD Soil Classification accepted.**

Data from soil share is from the harmonised world soil database (FAO et al., 2012). As for climate, NEXT is country tailored for soil. Soils are available according to the IPCC classification and the Harmonized World Soil Database (HWSD) (Batjes, 2010, Figure 8).

By default, the proposed soil list in NEXT is the one from the IPCC classification, based on the distribution of the dominant soils. Users can also select the HWSD classification or its equivalent in the IPCC's terminology, as described in Table 5 (Source: FAO-NEXT Technical guidelines, p.18) which provides the equivalence between the two classifications. An additional map of the distribution of the histosol is also provided in the tool (Batjes, 2010, Figure 10).

[40] FAO-NEXT, Technical guide, Ref. cc0568en, Figure 3 "Climate domains, climate regions, and FAO global ecological zoning framework for 2010", p.13-15.

ORMEX Methodology accepts the Projects set on all following soil types.

TABLE 5. Soil equivalence between the IPCC and the Harmonized World Soil Database

HWRD	IPCC	HWRD	HWRD
Acrisol - AC	LAC - Soils	Leptosol - LP	HAC - Soils
Albeluvisol - AB	HAC - Soils	Lixisol - LX	LAC - Soils
Alisol - AL	HAC - Soils	Luvisol - LV	HAC - Soils
Andosol - AN	Volcanic - Soils	Nitisol - NT	LAC - Soils
Anthrosol - AT	LAC - Soils	Phaeozem - PH	HAC - Soils
Arenosol - AR	Sandy - Soils	Planosol - PL	LAC - Soils
Calcisol - CL	HAC - Soils	Plinthosol - PT	LAC - Soils
Cambisol - CM	HAC - Soils	Podzol - PZ	Spodic - Soils
Chernozem - CH	HAC - Soils	Regosol - RG	HAC - Soils
Cryosol - CR	LAC - Soils	Solonchak - SC	LAC - Soils
Durisol - DU	LAC - Soils	Solonetz - SN	HAC - Soils
Ferralsol - FR	LAC - Soils	Stagnosol - ST	LAC - Soils
Fluvisol - FL	LAC - Soils	Technosol - TC	LAC - Soils
Gleysol - GL	Wetland - Soils	Umbrisol - UM	HAC - Soils
Gypsisol - GY	HAC - Soils	Vertisol - VR	HAC - Soils
Kastanozem - KS	HAC - Soils		

Source: Authors' elaboration based on IPCC, 2006, IPCC, 2019 and Batjes, 2010.

Figure 5 - Table 5 (NEXT Tool)

➢ Land-uses and other categories accepted

For Ormex Methodology purposes the following land uses, and other categories, eligible for Ormex Standard certification[41]:

- Cropland including annual cropland, annual cropland set-aside, perennial agroforestry, perennial monoculture, flooded rice cultivation;
- Grassland including grassland on mineral soil and organic soil (i.e., from peatlands module) and peat extraction;
- N-based fertilizers, urea, lime and dolomite.

[41] For more information, refer to pages 9-12 of FAO-NEXT technical guide, Ref: cc0568en.

➢ The Tool structure

The tool includes 7 modules covering the different components of the AFOLU sector. For the current version of Methodology, only the following modules are used, each represented by a worksheet within the tool[42] :

NEXT's components	Activities covered by the component
Home	Set up phase of the tool. Selection of the country, IPCC methodologies and global warming potential, timeframe of the reading grid.
Cropland & grassland	Cropland, grassland, settlement and other land management
Nutrient	N-based nutrient and, lime, dolomite and urea management
User Activity Data	To input the surfaces of progressive target scenarios implementation.
Results Summary, Reference, Target and Balance annual quantification	Broken down as a dashboard, a summary results of the GHG under the reference and target scenarios and the resulting balance, and 6 additional worksheets on the cumulated and annual GHG emissions for the reference, target and the balance, per activities and per gases.
Help & Definition	Climate map, ecological zones map, soil map and soil carbon stock helper. Definition of the main terminology, used in the tool.

4.1.3 Generic methodology to estimate greenhouse gas emissions and carbon sequestration (removal).

To estimate greenhouse gas emissions and carbon sequestration, ORMEX recognizes the FAO NEXT generic methodology, which is based on Chapter 2 of Volume 4 of IPCC Guidelines and Refinement (IPCC, 2006 & IPCC, 2019) details information on generic methodologies.

NEXT has been developed using primarily the volumes 4 of the IPCC 2006 Guidelines, the IPCC 2019 Refinement, and the IPCC 2013 Wetlands Supplement. The methodology described

[42] *Source*: Authors' elaboration based on FAO, 2023

hereafter applies to mineral soils and agricultural inputs (fertilizers). The tool retains CO2, CH4 and N2O, as the main gases for the estimations of carbon sequestration and GHG emissions. Table 6 oversees the different gases and related sources to help users understand the impact of their activities on the GHG gross fluxes and net balance when using specific modules.

Table 6. Mapping of the different greenhouse gases and their sources in the different NEXT modules

Module	Cropland & grassland	
	Activities	Changes of Management on soil, biomass, conversion to another land-use, rewetting on inland wetland mineral soil.
	CO_2	**Initial land**: N/A **Final land:** Carbon stock changes in biomass from conversion HWP if plantations or perennial systems in rotation. Carbon stock changes in soil from conversion and adoption of soil management practices for the new land. Emissions from flooded land reservoirs if final land-use* Emissions from inland wetland mineral soils that are assumed previously dry and are still used as croplands.
	CH_4	**Initial land:** Emissions from flooded rice if initial land-use Emissions from residues burning if adopted **Final land:** Emissions from flooded rice if final land-use Emissions from flooded land reservoirs if final use* Emissions from residues or biomass burning if adopted Emissions from fire from the conversion Emissions from rewetting if any of inland wetland mineral soils.
	N_2O	**Initial land:** Emissions from residues burning if adopted.

		Direct emissions from crop residues if left, retained or incorporated into the soils Indirect emissions (leaching) from crop residues if left, retained or incorporated into the soils **Final land:** Emissions from residues or biomass burning if adopted. Direct emissions from crop residues if left, retained or incorporated into the soils. Indirect emissions (leaching) from crop residues if left, retained or incorporated into the soils. Direct emissions from mineralisation of soil following conversion. Indirect emission (leaching) from soil mineralisation. Emissions from fire from the conversion.
Module	Ag. Inputs	
	Activities	Fertilisers, urea, manure, dolomite and limestone
	CO_2	Emissions from urea and/or limestone (and/or dolomite) application on managed soils.
	CH_4	Emissions from manure
	N_2O	Direct emissions from N-based fertilisers Indirect emissions from N-based fertilisers (volatilisation and leaching)

*Note: * Only if users selected "IPCC 2019 Refinement & IPCC 2013" in NEXT's "Home" menu.*
Figure 6 -Source: FAO Authors' elaboration based on NEXT, FAO 2023.

Chapter 2 of Volume 4 of IPCC Guidelines and Refinement (IPCC, 2006 & IPCC, 2019) details information on generic methodologies.

The generic methodologies are used principally to account for carbon stock changes and biomass burning during conversion between two categories.

➢ Methodology for calculation carbon stock removals

Carbon stock changes are addressed using the stock difference method for the 6 pools:

1) above-ground biomass (AGB),
2) below-ground biomass (BGB),

3) soil,
4) deadwood,
5) litter
6) and in some specific case harvested wood product (HWP).

See Equation 1 and below description.

Equation 1:

$$\Delta C_{landuse} = \Delta C_{AGB} + \Delta C_{BGB} + \Delta C_{soil} + \Delta C_{DD} + \Delta C_{litter} + \Delta C_{HWP\_produced}$$

Where:

$\Delta C_{landuse}$ = the carbon stock changes for a stratum of land-use category,

ΔC_{AGB} = the carbon stock change in above-ground biomass,

ΔC_{BGB} = the carbon stock change in below-ground biomass,

ΔC_{DD} = the carbon stock change in deadwood,

ΔC_{litter} = the carbon stock change in litter,

ΔC_{soil} = the carbon stock change in soil, and

$\Delta C_{HWP\_produced}$ = the carbon stock change in HWP produced in the country.

- **Methodology for calculating (non-stock) CO_2, CH_4 & N_2O emissions & reduction.**

Biomass burning, enteric fermentation, rewetting of inland wetland mineral soils (IWMS), aquaculture, soils management, land-use change, water quality management etc. among others are significant sources of methane (CH4) and nitrous oxide (N2O) emissions.

For those emissions, NEXT adopted the generic approach "as proposed in the IPCC - multiplying an activity's data with the emission factor for CH4 and N2O, as described in Equation 2.

Equation 2:

$$Emissions = AD_n \times EF$$

Where:

AD = the activity data at year n,

EF = the emission factor.

Emissions from N2O and CH4 are then converted using their global warming potential over a 100 years horizon from the IPCC Fifth Assessment Report, AR5, (Myhre et al., 2013), presented in Table 10 (FAO NEXT).

TABLE 10. Global warming potential over 100-years horizon for CH_4 and N_2O

	AR5 with climate-carbon feedback	AR5 without climate-carbon feedback
CH_4	34	28
N_2O	298	265

Figure 7 -Source: FAO NEXT, based on Myhre et al., 2013.

4.1.4 Quantification pools & parameters

➢ Above-Ground Biomass (AGB)

Default values for above-ground biomass (AGB) are estimates expressed in tones of dry matter per hectare (td.m./ha), (IPCC, 2006 & IPCC, 2019). The corresponding carbon stock, in tone carbon per hectare (tC/ha) is calculated using the specific carbon content indicated, e.g., it is 0.47 for above-ground forest biomass (see Table 4.3, IPCC, 2006 & IPCC, 2019) and 0.451 for mangrove forest biomass (see Table 4.2, IPCC, 2013). These carbon stocks are detailed in each module when necessary.

Default AGB values for cropland, grassland and settlement are referenced in Tables 160-168 for IPCC, 2019 in Annex III of the FAO NEXT Technical Guide. Default AGB values for perennial systems are referenced in Tables 169-179 for IPCC, 2019 in Annex III of the FAO NEXT Technical Guide. The Table 165, the Table 173 (FAO NEXT) give an example of the above-ground biomass in cropland & grassland as well as in different types of perennial systems in tropical moist climate.

TABLE 165. Above-ground biomass in cropland, grassland, settlement, in tC/ha/year, in tropical moist climate

Region	Annual cropland	Perennial agroforestry	Perennial monoculture	Flooded rice	Annual cropland set-aside	Grassland	Other land	Urban green	Settlement	Turfgrass	Cultivated soil
Sub-Saharan Africa	4.7	2.7	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
East Asia and South-East Asia	4.7	2.7	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
North America	4.7	2.7	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
Latin America and the Caribbean	4.7	2.7	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
Western Europe	4.7	2.7	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
Eastern Europe	4.7	2.3	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
Russian Federation	4.7	2.3	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
Oceania	4.7	2.3	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
NENA/Middle East	4.7	2.3	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**
South Asia	4.7	2.3	2.0	**4.7**	**4.7**	7.57	0	2.8	0	**7.57**	**4.7**

Notes: Values from annual cropland are used as a proxy for flooded rice, annual cropland set-aside and settlement cultivated soils. Values for grassland include above and below-ground biomass. Values from grassland is used as a proxy for settlement turfgrass. Perennial agroforestry and perennial monoculture are the average of their respective systems.

Figure 8 -Source: FAO NEXT authors' elaboration based on Table 5.2 and Table 5.3 for cropland and Table 6.4 for grassland, Table 8.1 for settlement, IPCC, 2019.

TABLE 173. Above-ground biomass in different type of perennial systems, in tC/ha/year, in tropical moist climate

Region	Alley crop.	Peren. fallow	Hedgerow	Multistrata	Park.	Shaded peren.	S. arable	S. pasture	Oil palm	Olive	Orchard	Rubber hevea	Short rotation coppice	Tea camelia	Vine
Sub-Saharan Africa	2.8	5.3	0.5	3.0	0.6	1.8	5.1	2.9	2.4			3.0		0.7	
East Asia and South-East Asia	2.8	5.3	0.5	3.0	0.6	1.8	5.1	2.9	2.4			3.0		0.7	
North America	2.8	5.3	0.5	3.0	0.6	1.8	5.1	2.9	2.4			3.0		0.7	
Latin America and the Caribbean	2.8	5.3	0.5	3.0	0.6	1.8	5.1	2.9	2.4			3.0		0.7	
Western Europe	2.8	5.3	0.5	3.0	0.6	1.8	5.1	2.9	2.4			3.0		0.7	
Eastern Europe	2.6	5.3	0.5	3.0	0.6	2.1	1.5	2.9	2.4			3.0		0.7	
Russian Federation	2.6	5.3	0.5	3.0	0.6	2.1	1.5	2.9	2.4			3.0		0.7	
Oceania	2.6	5.3	0.5	3.0	0.6	2.1	1.5	2.9	2.4			3.0		0.7	
NENA/Middle East	2.6	5.3	0.5	3.0	0.6	2.1	1.5	2.9	2.4			3.0		0.7	
South Asia	2.6	5.3	0.5	3.0	0.6	2.1	1.5	2.9	2.4			3.0		0.7	

Notes: Alley crop. = Alley cropping, Peren. fallow = Perennial fallow, Park = Parkland, Shaded peren. = Shaded perennial, S. arable = Silvoarable, S.pasture = Silvopasture.

Figure 9 -Source: Authors' elaboration based on Table 5.2 and Table 5.3 for respectively perennial agroforestry system and perennial monoculture, IPCC, 2019

TABLE 183. Maximum above-ground biomass at harvest cycle, in tC/ha

Climatic regions	Annual crop.	Perennial agro.	Perennial mono.	Flooded rice	Annual cropland set-aside	Grassland	Other land	Urban green	Settlem.	Turfgrass	Culti.soil
Boreal dry	4.7			**4.7**	**4.7**	4.00	0	63	0	**4.00**	**4.7**
Boreal moist	4.7			**4.7**	**4.7**	4.00	0	63	0	**4.00**	**4.7**
Boreal dry montane	4.7			**4.7**	**4.7**	4.00	0	63	0	**4.00**	**4.7**
Boreal moist montane	4.7			**4.7**	**4.7**	4.00	0	63	0	**4.00**	**4.7**
Cool temperate dry	4.7	42	28	**4.7**	**4.7**	3.06	0	63	0	**3.06**	**4.7**
Cool temperate moist	4.7	42	28	**4.7**	**4.7**	6.39	0	63	0	**6.39**	**4.7**
Cool temperate dry montane	4.7	42	28	**4.7**	**4.7**	3.06	0	63	0	**3.06**	**4.7**
Cool temperate moist montane	4.7	42	28	**4.7**	**4.7**	6.39	0	63	0	**6.39**	**4.7**
Warm temperate dry	4.7	42	28	**4.7**	**4.7**	2.87	0	84	0	**2.87**	**4.7**
Warm temperate moist	4.7	42	28	**4.7**	**4.7**	6.35	0	84	0	**6.35**	**4.7**
Warm temperate dry montane	4.7	42	28	**4.7**	**4.7**	2.87	0	84	0	**2.87**	**4.7**
Warm temperate moist montane	4.7	42	28	**4.7**	**4.7**	6.35	0	84	0	**6.35**	**4.7**
Tropical dry	4.7	40	28	**4.7**	**4.7**	4.09	0	84	0	**4.09**	**4.7**
Tropical moist	4.7	40	28	**4.7**	**4.7**	7.57	0	84	0	**7.57**	**4.7**
Tropical wet	4.7	40	28	**4.7**	**4.7**	7.57	0	84	0	**7.57**	**4.7**
Tropical montane	4.7	40	28	**4.7**	**4.7**	4.09	0	84	0	**4.09**	**4.7**

Notes: Values from annual cropland are used as a proxy for flooded rice, annual cropland set-aside and settlement cultivated soils. Values for grassland include above and below-ground biomass. Values from grassland is used as a proxy for settlement turfgrass. Perennial agroforestry and Perennial monoculture are the average of their respective systems.

Figure 10 -Source: FAO NEXT authors' elaboration based on Table 5.2 and Table 5.3 for cropland and Table 6.4 for grassland, Table 8.1 for settlement, IPCC, 2019.

TABLE 184. Maximum above-ground biomass at harvest cycle for perennial agroforestry and perennial monoculture, in tC/ha

Climatic regions	Alley crop.	Peren. fallow	Hedgerow	Multistrata	Park.	Shaded peren.	S. arable	S. pasture	Oil palm	Olive	Orchard	Rubber hevea	Short rotation coppice	Tea camelia	Vine
Boreal dry															
Boreal moist															
Boreal dry montane															
Boreal moist montane															
Cool temperate dry	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Cool temperate moist	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Cool temperate dry montane	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Cool temperate moist montane	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Warm temperate dry	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Warm temperate moist	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Warm temperate dry montane	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Warm temperate moist montane	47	22	9	65	12	48	72	58	60	9	9	80	13	21	6
Tropical dry	47	22	26	65	12	48	27	70	60	9	9	80	13	21	6
Tropical moist	47	22	26	65	12	48	27	70	60	9	9	80	13	21	6
Tropical wet	47	22	26	65	12	48	27	70	60	9	9	80	13	21	6
Tropical montane	47	22	26	65	12	48	27	70	60	9	9	80	13	21	6

Notes: Alley crop. = Alley cropping, Peren. fallow = Perennial fallow, Park = Parkland, Shaded peren. = Shaded perennial, S. arable = Silvoarable, S. pasture = Silvopasture.

Figure 11 -Source: FAO NEXT authors' elaboration based on Table 5.1 for Perennial agroforestry, Table 5.3 for Perennial monoculture, IPCC, 2019.

➢ Below-Ground Biomass (BGB)

For forests and plantations, below-ground biomass is derived from the above-ground biomass using a ratio R of below-ground biomass to above-ground biomass expressed in tonne root d.m/tonne shoot d.m. The below-ground biomass is estimated only for natural forests and forest plantation, and when using the IPCC 2019 methodologies, also for perennial agroforestry and perennial monoculture. R is additionally disaggregated for natural forests and forest plantations in IPCC 2019, while this is not the case for the IPCC 2006. Default R values are referenced from Table 177 to Table 182 for IPCC, 2019, in Annex III of FAO NEXT Technical guide.

Here is an example of below ground biomass in different types of perennial systems for Tropical moist climate:

TABLE 181. Below-ground biomass in different type of perennial systems, in tC/ha/year, in tropical moist climate

Region	Alley crop.	Peren. fallow	Hedgerow	Multistrata	Park.	Shaded peren.	S. arable	S. pasture	Oil palm	Olive	Orchard	Rubber hevea	Short rotation coppice	Tea camelia	Vine
Sub-Saharan Africa	0.6	1.3	0.1	0.7	0.2	0.4	1.2	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
East Asia and South-East Asia	0.6	1.3	0.1	0.7	0.2	0.4	1.2	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
North America	0.6	1.3	0.1	0.7	0.2	0.4	1.2	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
Latin America and the Caribbean	0.6	1.3	0.1	0.7	0.2	0.4	1.2	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
Western Europe	0.6	1.3	0.1	0.7	0.2	0.4	1.2	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
Eastern Europe	0.6	1.3	0.1	0.7	0.2	0.5	0.4	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
Russian Federation	0.6	1.3	0.1	0.7	0.2	0.5	0.4	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
Oceania	0.6	1.3	0.1	0.7	0.2	0.5	0.4	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
NENA/Middle East	0.6	1.3	0.1	0.7	0.2	0.5	0.4	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0
South Asia	0.6	1.3	0.1	0.7	0.2	0.5	0.4	0.8	0.0	0.0	0.0	0	0.0	0.0	0.0

Notes: Alley crop. = Alley cropping, Peren. fallow = Perennial fallow, Park = Parkland, Shaded peren. = Shaded perennial, S. arable = Silvoarable, S. pasture = Silvopasture. There is no information for perennial monoculture.

Figure 12 -Source: FAO NEXT authors' elaboration based on Table 5.2 for respectively perennial agroforestry system, IPCC, 2019.

➢ Litter and deadwood

The tier 1 approach assumes that litter and deadwood pools are zero in all non-forest categories. In some specific cases, countries might include carbon stock for deadwood and litter for perennial agroforestry and perennial monoculture, and associated changes in case of transition to other land-use. These options are available in the Tier 2 section of the tool, in the "non-forest lands" and sub-module "inland peatlands management".

➢ Mineral soil carbon (SOC)

For the soil organic carbon (SOC) estimates, the default values are based on default references for soil organic carbon (SOCref) stocks for mineral soils to a depth of 30 cm (Table 2.3, IPCC, 2006 & IPCC, 2019). The SOC change is computed based on carbon stock after the management change relative to the carbon stock in a reference condition (i.e. native vegetation that is not degraded or improved), see Equation 3. This is facilitated assuming that:

1) Over time, SOC reaches a spatially-averaged, stable value specific to the soil, climate, land-use and management practices.
2) SOC stock changes during the transition to a new equilibrium SOC occur in a linear fashion.

Assumption (1) i.e., that under a given set of climate and management conditions, soils tend towards an equilibrium carbon content. Although soil carbon changes in response to management changes may often be best described by a curvilinear function, assumption (2) greatly simplifies the methodology and provides a good approximation over a multi-year period, where changes in management and land-use conversions are occurring.

Equation 3:

$$Soil_{mineral} = SOC_{ref} \times F_{Lu} \times F_{Mg} \times F_{I} \times A$$

Where:

$SOC_{mineral}$ = Total mineral SOC at a defined time, in tC/ha;

SOC_{ref} = SOC in the reference condition, in tC/ha;

F_{Lu} = Stock change factor for mineral SOC land-use system or sub-systems, dimensionless;

F_{MG} = Stock change factor for mineral SOC for management regime, dimensionless;

F_{I} = Stock change factor for mineral SOC for the inputs of organic amendments; dimensionless and

A = Land area under the different management, in ha.

Default IPCC SOC_{ref} are presented in Table 8, while stock change factors are provided in the Table 85, Table 86 & Table 87 (FAO NEXT).

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TABLE 8. Default SOC_{ref} values under native vegetation of soil organic carbon stock for mineral soils, in tC/ha, according to the IPCC 2006 Guidelines (2006), IPCC 2013 Supplement for wetlands soils (2013), and IPCC 2019 Refinement (2019)

Forest types	HAC		LAC		Sandy		Spodic		Volcanic		Wetland
	2006	2009	2006	2009	2006	2009	2006	2009	2006	2009	2013
Boreal dry	68	63			10	10	117	117	20	20	116
Boreal moist	68	63			10	10	117	117	20	20	116
Boreal dry montane	68	63			10	10	117	117	20	20	116
Boreal moist montane	68	63			10	10	117	117	20	20	116
Cool temperate dry	50	43	33	33	34	13			20	20	87
Cool temperate moist	95	81	85	76	71	51	115	128	130	136	128
Cool temperate dry montane	50	43	33	33	34	13			20	20	87
Cool temperate moist montane	95	81	85	76	71	51	115	143	130	136	128
Warm temperate dry	38	24	24	19	19	10			70	84	74
Warm temperate moist	88	64	63	55	34	36			80	138	135
Warm temperate dry montane	38	24	24	19	19	10			70	84	74
Warm temperate moist montane	88	64	63	55	34	36			80	138	135
Tropical dry	38	21	35	19	31	9			50	50	22
Tropical moist	65	40	47	38	39	27			70	70	68
Tropical wet	44	60	60	52	66	46			130	77	49
Tropical montane	88	51	63	44	34	52			80	96	82

Figure 13 -Source: FAO NEXT authors' elaboration based on Table 2.3, IPCC, 2006 for SOC ref in 2006, Table 5.2, IPCC, 2013 for the SOC of the wetland's soils, and Table 2.3 updated, IPCC, 2019 for SOC reference in 2019.

Long-term cultivated (F_{LU}): Represents area that has been converted from native conditions and continuously managed for predominantly annual crops over 50 years.

Tillage management (F_{MG}): Represents the different tillage practices in cropland, (IPCC, 2019).

- **Full:** Substantial soil disturbance with full inversion and/or frequent (within year) tillage operations. At planting time, little (i.e. <30 percent) of the surface is covered by residues.
- **Reduced:** Primary and/or secondary tillage but with reduced soil disturbance (usually shallow and without full soil inversion). Normally leaves surface with >30 percent coverage by residues at planting.
- **No-till:** Direct seeding without primary tillage, with only minimal soil disturbance in the seeding zone. Herbicides are typically used for weed control.

TABLE 185. Relative soil stock carbon changes factor for land used as cropland, grasslands, settlement and cropland on inland wetlands mineral soils, Flu, dimensionless

Climatic regions	Annual crop.	P. agro.	P. mono.	Flooded rice	Annual crop set-aside	Grassland	Other land	Urban green	Settlem.	Turfgrass	Culti. Soils	Crop. on IWMS drained	Crop. on IWMS rewetted <20 yrs	Crop. on IWMS rewetted >20 yrs
Boreal dry	0.80	0.72	0.72	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.14	0.96	0.71	0.8
Boreal moist	0.70	0.72	0.72	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.14	0.89	0.71	0.8
Boreal dry montane	0.80	0.72	0.72	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.14	0.96	0.71	0.8
Boreal moist montane	0.70	0.72	0.72	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.14	0.89	0.71	0.8
Cool temperate dry	0.77	0.72	0.72	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.14	0.96	0.71	0.8
Cool temperate moist	0.70	0.72	0.72	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.14	0.89	0.71	0.8
Cool temperate dry montane	0.80	0.72	0.72	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.14	0.96	0.71	0.8
Cool temperate moist montane	0.70	0.72	0.72	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.14	0.89	0.71	0.8
Warm temperate dry	0.76	0.72	0.72	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.14	0.97	0.71	0.8
Warm temperate moist	0.69	0.72	0.72	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.14	0.90	0.71	0.8
Warm temperate dry montane	0.76	0.72	0.72	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.14	0.97	0.71	0.8
Warm temperate moist montane	0.69	0.72	0.72	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.14	0.90	0.71	0.8
Tropical dry	0.92	1.01	1.01	1.35	0.93	1.00	1.00	0.64	1.00	0.8	1.17	0.97		0.8
Tropical moist	0.83	1.01	1.01	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.17	0.90		0.8
Tropical wet	0.83	1.01	1.01	1.35	0.82	1.00	1.00	0.64	1.00	0.8	1.17	0.90		0.8
Tropical montane	0.92	1.01	1.01	1.35	0.88	1.00	1.00	0.64	1.00	0.8	1.16	0.92		0.8

Notes: Annual crop. = Annual cropland, P. agro. = Perennial agroforestry, P. mono. = Perennial monoculture, Settlem. = Settlement, Culti. Soils = Cultivated soils in settlement. Values from settlement cultivated soil is the product of the Flu for settlement time Fmg "no-tillage" on cropland.

Figure 14 -Source: FAO NEXT authors' elaboration based on Table 5.5 for cropland and table 6.4 for grassland, p. 8.24 for settlement, p. 9.7 for other land and table 5.3 for Inland wetland mineral soil, IPCC, 2019.

TABLE 186. Relative soil stock carbon changes factor for tillage on mineral soils, F_{Mg}, dimensionless

Climatic regions	Cropland						Grassland			
	Full tillage	Reduced tillage	No-tillage	Rewetting & Full tillage	Rewetting & Reduced tillage	Rewetting & No-tillage	Non degraded	Moderately degraded	Severely degraded	Improved
Boreal dry	1	0.98	1.03	1.00	1.02	1.10	1	0.9	0.7	1.14
Boreal moist	1	1.04	1.09	1.00	1.08	1.15	1	0.9	0.7	1.14
Boreal dry montane	1	0.98	1.03	1.00	1.02	1.10	1	0.9	0.7	1.14
Boreal moist montane	1	1.04	1.09	1.00	1.08	1.15	1	0.9	0.7	1.14
Cool temperate dry	1	0.98	1.03	1.00	1.02	1.10	1	0.9	0.7	1.14
Cool temperate moist	1	1.04	1.09	1.00	1.08	1.15	1	0.9	0.7	1.14
Cool temperate dry montane	1	0.98	1.03	1.00	1.02	1.10	1	0.9	0.7	1.14
Cool temperate moist montane	1	1.04	1.09	1.00	1.08	1.15	1	0.9	0.7	1.14
Warm temperate dry	1	0.99	1.04	1.00	1.02	1.10	1	0.9	0.7	1.14
Warm temperate moist	1	1.05	1.10	1.00	1.08	1.15	1	0.9	0.7	1.14
Warm temperate dry montane	1	0.99	1.04	1.00	1.02	1.10	1	0.9	0.7	1.14
Warm temperate moist montane	1	1.05	1.10	1.00	1.08	1.15	1	0.9	0.7	1.14
Tropical dry	1	0.99	1.04	1.00	1.09	1.17	1	0.9	0.7	1.17
Tropical moist	1	1.10	1.10	1.00	1.15	1.22	1	0.9	0.7	1.17
Tropical wet	1	1.10	1.10	1.00	1.15	1.22	1	0.9	0.7	1.17
Tropical montane	1	0.99	1.04	1.00	1.09	1.16	1	0.9	0.7	1.16

Figure 15 -Source: FAO NEXT authors' elaboration based on Table 5.5 for cropland and table 6.2 for grassland, IPCC, 2019.

Input of organic material (F_I): Represents the different levels of C input to soil (IPCC, 2019).

- **Low:** Low residue return occurs when there is removal of residues (via collection or burning), frequent bare-fallowing, production of crops yielding low residues (i.e. vegetables, tobacco and cotton), no mineral fertilization or N-fixing crops.
- **Medium:** Representative for annual cropping with cereals where all crop residues are returned to the field. If residues are removed, then supplemental organic matter (i.e. manure) is added. Also requires mineral fertilization or N-fixing crop in rotation.
- **High without manure:** Represents significantly greater crop residue inputs over medium carbon input cropping systems due to additional practices, such as production of high residue yielding crops, use of green manures, cover crops, improved vegetated fallows, irrigation, frequent use of perennial grasses in annual crop rotations, but without manure applied.
- **High with manure:** Represents significantly higher carbon input over medium carbon input cropping systems due to an additional practice of regular addition of animal manure.

Residue management: Represents the type of residue management practices in annual cropping systems (IPPC, 2019).

- **Burned:** agriculture crop residues are burned.
- **Retained:** agriculture crop residues are retained in the field.
- **Exported:** agriculture crop residues are removed from the field (i.e. fed to animals).

TABLE 187. Relative soil stock carbon changes factor for input on mineral soils, F_I, dimensionless

Climatic regions	Cropland Low	Cropland Medium	Cropland High without manure	Cropland High with manure	Grassland High with manure
Boreal dry	0.95	1	1.04	1.37	1.11
Boreal moist	0.92	1	1.11	1.44	1.11
Boreal dry montane	0.95	1	1.04	1.37	1.11
Boreal moist montane	0.92	1	1.11	1.44	1.11
Cool temperate dry	0.95	1	1.04	1.37	1.11
Cool temperate moist	0.92	1	1.11	1.44	1.11
Cool temperate dry montane	0.95	1	1.04	1.37	1.11
Cool temperate moist montane	0.92	1	1.11	1.44	1.11
Warm temperate dry	0.95	1	1.04	1.37	1.11
Warm temperate moist	0.92	1	1.11	1.44	1.11
Warm temperate dry montane	0.95	1	1.04	1.37	1.11
Warm temperate moist montane	0.92	1	1.11	1.44	1.11
Tropical dry	0.95	1	1.04	1.37	1.11
Tropical moist	0.92	1	1.11	1.44	1.11
Tropical wet	0.92	1	1.11	1.44	1.11
Tropical montane	0.94	1	1.08	1.41	1.11

Figure 16 -Source: Authors' elaboration based on Table 5.5 for cropland and table 6.2 for grassland, IPCC, 2019.

- **Harvested wood product (HWP)**

The harvested wood products pool comprises all wood materials (including bark) that leave harvest sites such as (i) wood products in use, i.e. wood utilised as a material, (ii) wood biomass used for energy purposes and (iii) wood biomass in solid waste disposal sites (IPCC, 2019.)

The wood products used as materials include three commodity classes of semi-finished wood products in the IPCC, 2019, i.e., sawnwood, wood-based panels and paper and paperboard (IPCC, 2019).

For a more detailed information about HWP, the Project Holder should refer to the FAO NEXT technical guide.

4.1.5 Scenarios data identification

- **Dynamics of changes**

NEXT proposes four (4) dynamics of implementation of the climate actions: linear, S-shaped curve, exponential and progressive user activity data based:

1) A linear dynamic considers a constant annual implementation of the activities.
2) The S-shaped curve considers a smooth implementation of the climate action, followed by a strong increase, before reaching full implementation of the action.

3) The exponential dynamic considers a steep implementation of the climate action at its beginning before reaching a plateau by its end.

4) To bring more precision and accuracy, the user data-based scenario was added in 2023, in order to establish a progressive annual surface implementation per scenario by the Project Holders

➢ Methodology to estimate the land use change

Conversion to another land category or changes in land-use management may be associated with a change of carbon from the biomass, the soil, eventual litter and deadwood and transfer of new biomass to the HWP pool.

In the year of the conversion, NEXT assumes the initial carbon stock is at equilibrium, and all this carbon will be lost and returned to the atmosphere if not transfer to the HWP, while in the new land-use, the carbon sequestered in the biomass, and the loss or sequestration of carbon in the non-flooded soil is accounted the 1st year following the conversion.

The default values are proposed for each pool of each category (or subcategory or even main vegetation type) in the "Tier 2" section, which is to the right of the main module. Equation 3 describes carbon stock changes occurring from one year to the next from the conversion or changes in management practices on a given area.

Equation 4:

$$\Delta C = (Ct_{n+1} - Ct_n)_{initial} + (Ct_{n+1} - Ct_n)_{final}$$

Where:

ΔC = the annual carbon stock change in the initial and final land-use following the conversion, in tC/year,

Ctn = the carbon stock in the pool at year n, in tC, and

$Ctn+1$ = the carbon stock in the pool at year n+1, in tC.

Regardless of the period of implementation of the climate actions, NEXT estimates carbon stock changes in the soil compartment over 20 years following changes in management practices and or land-use changes on a given land and area.

All carbon stock changes, in tC, are converted into CO_2-e using a conversion factor of 44/12. A positive carbon stock change from one year to a successive one will mean a loss of carbon stock and thus CO_2 emission back to the atmosphere, while a negative carbon stock change will mean carbon sequestration and carbon removal from the atmosphere.

➢ Data requirements within the tool NEXT

1) Cropland & Grassland Scenarios

Once in the FAO-NEXT tool, the worksheet "Crops & Grass" allows to estimate GHG emissions reductions and carbon removals from land-use changes between non-forest land (see the list below) and/or changes in management practices on land-uses that stay in the same classes (no change in land-use with time).

All the factors and Tier 1 parameters are automatically entered in the calculator, according to the chosen Country, Climate, and Mineral Soil type.

This component covers the following land-uses:

- Annual cropland,
- Annual cropland set-aside,
- Flooded rice,
- Perennial agroforestry,
- Perennial monoculture,
- Grassland,
- Settlement,
- Other land, and
- Flooded land

In tropical environment, Fruit trees and Nut trees plantations may be configured as Perennial agroforestry (Multistrata).

In this worksheet, users should provide the following information in the main panel, see also Figure 34 (FAO NEXT):

- ✓ The conditionality of the climate action, i.e., unconditional or conditional,
- ✓ The climate,
- ✓ The initial land-use,
- ✓ The initial land-use type if it is annual cropland, perennial agroforestry, perennial monoculture and settlement,

  The initial soil management or water management to cultivation in case the initial land-use is "flooded rice",

- ✓ The initial soil input or the water management during the cultivation if the initial land-use is "flooded rice",
- ✓ The residue management for cropland, or the fire management for grassland, or the organic amendment used for flooded rice,

- ✓ The final land-use,
- ✓ The final land-use type if it is annual cropland, perennial agroforestry, perennial monoculture and settlement. If the final land-use category is "flooded land (Reservoir)", users should also specify the trophic status of the water,
- ✓ The final soil management or water management in case the final land is "flooded rice",
- ✓ The final soil input or the water management during the cultivation if the final land is "flooded rice",
- ✓ The residue management for cropland, or the fire management for grassland, or the organic amendment used for flooded rice,
- ✓ The type of soil according to the IPCC or the HWSD classification,
- ✓ The year the climate action starts (base year) and the year it is fully implemented (target year), and
- ✓ The initial area that will be converted or differently managed under the reference and or the target situations.

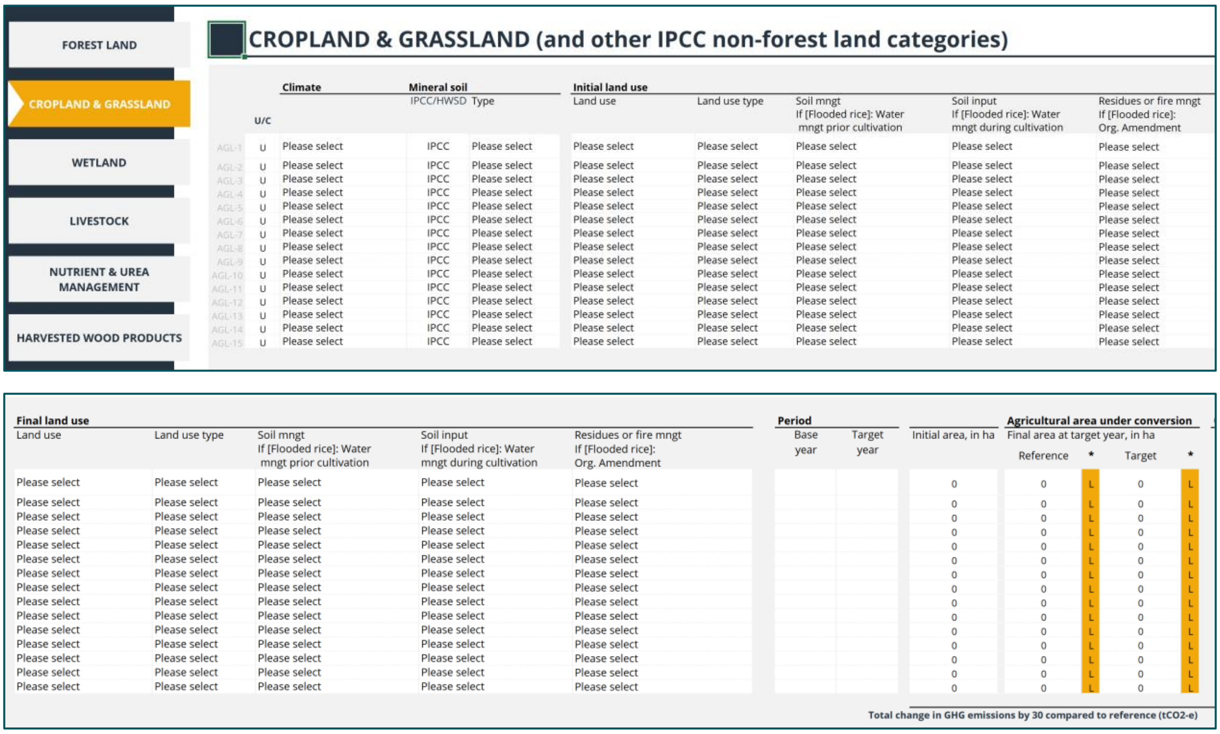


Figure 17 - screenshots of the worksheet "Crops & Grass" in FAO NEXT tool:

Each line corresponds to a scenario, determined with Level 1, 2 and 3 practices, for an original combination of climate, mineral soil and Land use (e.g., Crop type: maize, soja, rice).

The Regenerative Activities of Level 1, 2 and 3 of the Methodology, regroup a combination of:

- Soil Management (tilling, reduced tilling or no tilling), corresponding to F_{MG} factor;
- Soil Input (that would nourish or deplete soils): low, medium, high without manure, and high with manure, corresponding to F_I factor.
  The Soil Input is a combination of several techniques to nourish the soils, through cover crops, intercropping, organic fertilizers, etc.
  According to the Level 1, 2 or 3 of Regenerative Activities, a different level of Soil Input should be chosen:
  1) For Level 1 – Soil Input Medium
  2) For Level 2 – Soil Input High without Manure
  3) For Level 3 – Soil Input High with Manure.
- Residues management

In case there are multiple annual crops, represented within the same project, the Project Holder should ensure that the Area is not calculated in double in case of the rotation of 2 crops in the same Area during the same year.

In case of a rotation observed, the area should be counted just once for either of the two crops.

2) Setting the Area within a progressive Surface implementation scenario.

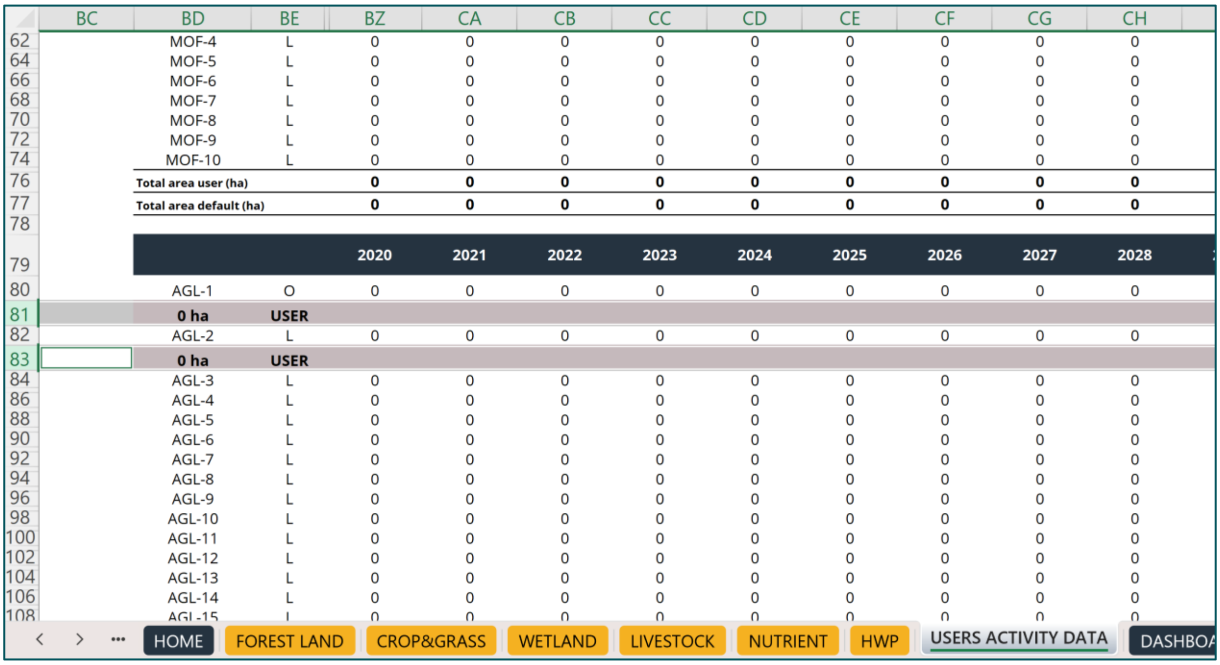
The new version of NEXT (2023) offers a possibility for the Grouped projects and National projects at scale to set their own progressive surfaces in an annual basis in the worksheet "User Activity Data".

To activate the "User Activity Data", you need first to set the Target Agricultural Area under conversion in "Crops & Grass" worksheet to "O":

Period			Agricultural area under conversion				Cumulated results at year 2050		
Base year	Target year	Initial area, in ha	Final area at target year, in ha				Reference	Target	Potential
			Reference	*	Target	*			
2020	2050	125 000	0	L	0	O	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
		0	0	L	0	L	0	0	0
Total change in GHG emissions by 2050 compared to reference (tCO_2-e)							0	0	0

Figure 18-screenshots of the worksheet "Crops & Grass" in FAO NEXT tool -progressive surfaces option:

Then, once in the "User Activity Data", scroll to columns starting from BD and lines 79 for "Crops & Grass" Target dynamic scenarios.



	BC	BD	BE	BZ	CA	CB	CC	CD	CE	CF	CG	CH
62		MOF-4	L	0	0	0	0	0	0	0	0	0
64		MOF-5	L	0	0	0	0	0	0	0	0	0
66		MOF-6	L	0	0	0	0	0	0	0	0	0
68		MOF-7	L	0	0	0	0	0	0	0	0	0
70		MOF-8	L	0	0	0	0	0	0	0	0	0
72		MOF-9	L	0	0	0	0	0	0	0	0	0
74		MOF-10	L	0	0	0	0	0	0	0	0	0
76		**Total area user (ha)**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
77		**Total area default (ha)**		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
78												
79				**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**
80		AGL-1	O	0	0	0	0	0	0	0	0	0
81		**0 ha**	**USER**									
82		AGL-2	L	0	0	0	0	0	0	0	0	0
83		**0 ha**	**USER**									
84		AGL-3	L	0	0	0	0	0	0	0	0	0
86		AGL-4	L	0	0	0	0	0	0	0	0	0
88		AGL-5	L	0	0	0	0	0	0	0	0	0
90		AGL-6	L	0	0	0	0	0	0	0	0	0
92		AGL-7	L	0	0	0	0	0	0	0	0	0
94		AGL-8	L	0	0	0	0	0	0	0	0	0
96		AGL-9	L	0	0	0	0	0	0	0	0	0
98		AGL-10	L	0	0	0	0	0	0	0	0	0
100		AGL-11	L	0	0	0	0	0	0	0	0	0
102		AGL-12	L	0	0	0	0	0	0	0	0	0
104		AGL-13	L	0	0	0	0	0	0	0	0	0
106		AGL-14	L	0	0	0	0	0	0	0	0	0
108		AGL-15	L	0	0	0	0	0	0	0	0	0

Figure 19 -screenshots of the worksheet "User Activity Data" in FAO NEXT tool - progressive surfaces option

Open the hidden lines: 81/83 to set the additional annual surfaces for each scenario. Only Entire values (without decimals) are accepted. Otherwise, the Cumulated Target value in "Crops & Grass" would stay equal to 0 and would not be calculated.

For the all the years that will not implement any new surface, input 0.

Within the column BD, make sure to enter the total cumulated area per scenario. This Total area then needs to be reported in Cumulated Target area within the worksheet "Crops & Grass". Do not use copy/past within the calculator as the formulars are automatically integrated by NEXT and this can cause issue for the calculation.

From this information NEXT will estimate changes in biomass, SOC and other GHG fluxes associated with a change in management, including for residues and or water table level.

For the initial land, NEXT assumes systems are at equilibrium for the soil and the biomass. This means NEXT does not take into account an increase of carbon from biomass and soil sequestration. The consequence of this, is that the Cumulated result of the Reference (or Baseline) may remain 0 within the calculator, as only the net change is taken into account for the Target.

3) Tier 2 values input

For the precision of the calculation, the Initial and Target Tier 2 values can be imputed by the Project Holder. Until the Tier 2 cells are empty, the Tier 1 values will be automatically used for the following quantification pools (starting from the column AT in "Crops & Grass" panel):

INITIAL LAND USE - CROPLAND & GRASSLAND TIER 2

Above and below-ground biomass				Soil		AG Residue mngt			Yield cropland		Fire use during conversion	
AGB tC/ha		BGB tC/ha		SOC tC/ha		Residues (tdm/ha)**		Periodicity Burning	Yield cropland t dm/ha/yr		Reference	Target
Tier 1	Tier 2	Tier 1	Tier 2	Tier 1	Tier 2	Tier 1	Tier 2	Years	Tier 1	Tier 2		
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No
0,0		0,0		0,0		0,00		1	0,00		No	No

Yield of Year 2019
for annual cropland only

FINAL LAND USE - CROPLAND (1) & GRASSLAND TIER 2

Above and below-ground biomass growth rate & HWP perennial								Soil - CO2 SOC & CH4 rewetting IWMS				Residue mngt			Yield cropland	
AGB tC/ha/yr		BGB tC/ha/yr		Maturity Cycle (years)		HWP - Perennial		SOC tC/ha		CH4 rewetting kg CH4/ha/yr		Residues (tdm/ha)**		Periodicity Burning	t dm/ha/yr	
Tier 1	Tier 2	Tier 1	Tier 2	Tier 1	Tier 2	Rotation*	Years	Tier 1	Tier 2	Tier 1	Tier 2	Tier 1	Tier 2	Years	Tier 1	Tier 2
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	
0,0		0,0		0		No	3	0,0		0		0,00		1	0,00	

*for perennial system only!

*3 rotations minimum

** for annual cropland only

Yield of Year 2019
for annual cropland only

(1) except flooded rice, see section to the right

Figure 20 -screenshots of the worksheet "Crops & Grass" in FAO NEXT tool

Few activities generating GHG emissions under initial land-use are still estimated when it remains unchanged, e.g., emissions from flooded rice, residues burning among others. As a consequence, the Cumulated results under "Reference" would show a positive number, due to these activities.

Note that users can also specify the different management practices of flooded rice up to 3 cultivation seasons per year.

4) Nutrients and urea management inputs

In the worksheet « Nutrients », it is possible to parameter the strategy of N-fertilizers reduction

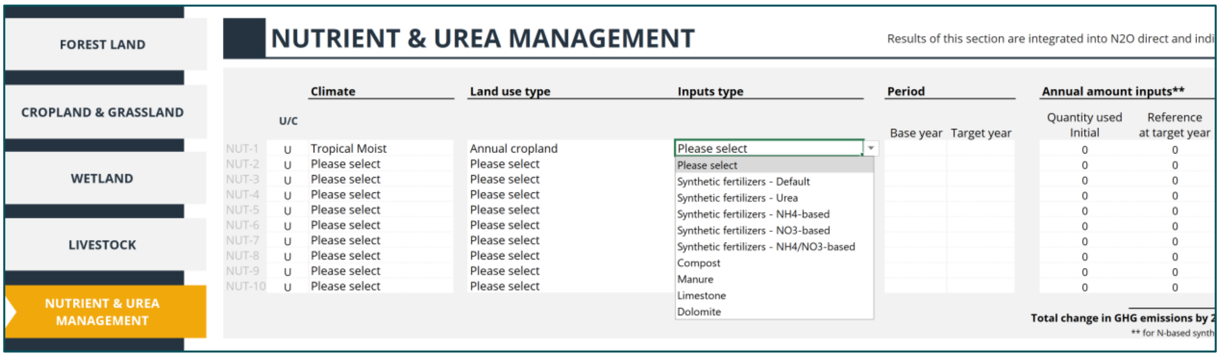


Figure 21 -screenshots of the worksheet "Nutrient & User management" in FAO NEXT tool

The results of this section are integrated into N2O direct and indirect of managed soils, and CO2 soil fertilizers. For N-based synthetic fertilizers provide in t N/yr, for urea in t urea/yr, for lime and dolomite in t/yr.

Once all the data are set, the results are provided through the "Dashboard", "Results Summary" and 6 additional panels for Annual and cumulative results of the Baseline, Target and Balance. The distribution is done for several gazes and concerns the GHG reduction and carbon removal.

BALANCE	Biomass CO2	0	0	0	0	0	0
	HWP CO2 net	0	0	0	0	0	0
	Soil mineral CO2	0	0	0	0	0	0
	Soil mineral CH4 (IWMS rewetted)	0	0	0	0	0	0
	Direct N2O from managed soils (include N2O PRP)	0	0	0	0	0	0
	Indirect N2O from managed soils (include N2O PRP)	0	0	0	0	0	0
	CO2 soil (fertilizers)	0	0	0	0	0	0
	Organic soil CO2	0	0	0	0	0	0
	Organic soil CH4	0	0	0	0	0	0
	Organic soil N2O	0	0	0	0	0	0
	CH4 flooded rice	0	0	0	0	0	0
	CO2 coastal and flooded land	0	0	0	0	0	0
	CH4 coastal and flooded land	0	0	0	0	0	0
	N2O Aquaculture - Coastal wetlands	0	0	0	0	0	0
	CH4 livestock - Enteric fermentation	0	0	0	0	0	0
	CH4 livestock - Manure management (except PRP)	0	0	0	0	0	0
	N2O livestock - Manure management (except PRP)	0	0	0	0	0	0
	Fire CO2	0	0	0	0	0	0
	Fire CH4	0	0	0	0	0	0
	Fire N2O	0	0	0	0	0	0
	Fire CO2 (organic soil)	0	0	0	0	0	0
	Fire CH4 (organic soil)	0	0	0	0	0	0
	CO2	0	0	0	0	0	0
	CH4	0	0	0	0	0	0
	N2O	0	0	0	0	0	0
	Total	**0**	**0**	**0**	**0**	**0**	**0**

WETLAND | LIVESTOCK | NUTRIENT | HWP | USERS ACTIVITY DATA | DASHBOARD | RESULTS SUMMARY

Figure 22 -screenshots of the worksheet “Dashboard”, “Results Summary” in FAO NEXT tool

4.2 Deforestation rate quantification

For the Grouped project and National Projects, the Project Holder should demonstrate by the image and figures the deforestation surface value (in percentage of the surface) within the whole geographical zone and within the 10 years prior to the Project Start Date.

For the local Grouped Projects, the area around the total Project Surface should be observed.

For the National Projects, the National % (unless a more precise value of the region/department/municipality is not available) should be applied to maintain the conservative approach.

Consequently, the 1st year Estimated Surface, used for the Carbone Quantification should be decreased by this percentage, in order to do not include the Deforested surfaces in the project.

The deforestation rate data can be provided through *https://www.globalforestwatch.org/ website.*

4.3 Permanency risk buffer & uncertainly quantification

The FAO NEXT tool does not apply an Uncertainty rate on the calculations.

For the purpose of ORMEX Methodology, an **Uncertainty rate** of 5% is applied for all projects using Tier 2, and an uncertainty rate of 10% is applied for all projects using Tier 1 data.

To calculate the tCO2e related to the Uncertainty, the Project Holder directly multiplies the Amount of tCO2e within the Project by the Uncertainty Rate.

The **Permanency risk buffer** is determined basing on the Risk Level, determined according to the rules in Section 6: Permanency & Risk management.

Once all the risks are accessed and the mitigation actions are determined, the Total Risk Management Level that is retained is the Highest risk of at least one of the Risk management items.

Here is the associated rate for each level of Risk:

Total Risk Management Level, associated with the project	Risk Buffer (%)
Very High (should include strong political risks)	25%
High	20%
Medium	10%
Low (can be retained only for the Past Started Projects, where the practices are already implemented).	5%

The Risk Buffer Rate is applied on the Total Gross Quantity less the Uncertainty Quantity.

4.4 Carbon credits net amount quantification

Once all the discounts applied, the Total Net Carbon Quantity is calculated using this Formular.

Equation 5:

$$\text{Net Carbon Quantity} = \text{Gross Carbon Quantity} - \text{Uncertainty Quantity} - \text{Risk Buffer Quantity}$$

The Net Carbon Quantity is expressed in tCO2e. Each tone corresponds to the Estimated Sellable Carbon Credit (CC) for a Vintage period.

This estimated Sellable Carbon Credit quantity must be confirmed (or edited) by the approved Verification & Validation Body (VVB) to become Verified Sellable Carbon Credits. This condition is mandatory before any emission of Carbon Credits on Ormex Registry.

The Vintage Periods are defined in ORMEX STANDARD.

5 PROJECT SCENARIO IMPLEMENTATION

5.1 Determining the project life cycle

5.1.1 General

It is generally not possible to implement all the Regenerative Activities in a single stage. In the Project Plan, the Project Holder identifies the major stages in the life cycle of the Project.

5.1.2 Project life cycle

The Project Holder is responsible for following the Project life cycle and initiate the expected validation and verification phases in accordance with the provisions of the ORMEX Standard. It undertakes to carry out the Project monitoring and reporting operations specified in Section 7.

5.2 Project organization

The Project Holder must describe the organisation put in place to guarantee the monitoring of the Project cycle and risk management (Section 6) and take all necessary corrective actions and measures to ensure that the Project runs according to schedule and under the conditions specified in the PDD.

The proposed organisation must be adequate and in keeping with the scope of the Project.

The Project Holder will demonstrate the conditions and procedures for involving stakeholders in the design of the Project, as well as in the monitoring phases.

The Project Holder details the methods of public consultation applied to the Project.

5.3 Validation and Verification phase

The Project Holder undertakes to choose a VVB approved by the ORMEX Standard from the list proposed.

The Verification Phase must be carried out at the request of the Project Holder and at most every 5 years. It will result in recognition of the quantification of the Carbon Balance for the period verified.

The MRV procedures are specified in Section 7.

6 PERMANENCY & RISK MANAGEMENT

The Project Holder sets up a risk management table for each Cropping/Agrarian System in order to determine the potential risks of environmental and social impacts of the implementation of the Project, as well as the hazards that may occur in its implementation. The Project Holder can identify the risks using the main themes set out below in relation to the three main areas of risk.

It is the responsibility of the Project Holder to identify the risks associated with the Project. The Project Holder is free to complete the identification of risks according to the Project. In any event, the Project Holder must justify the assumptions made.

The risk table is monitored on an annual basis and the historical data is submitted to the external auditor during the Validation and Verification phases.

A specific interview with the auditor must be scheduled to analyse the risks mentioned and the associated justifications. In his report, the auditor should give an opinion on the company's position with regard to risk management and specify any areas for improvement that may be necessary.

For each risk, a level (minor/medium/high/Very high) is applied according to the probability of occurrence (If the Project Holder has categorised the farms in order to monitor the indicators associated with the implementation of Agroecological Practices, then the analysis of each risk can be assessed by farm category). A score is awarded according to the level of risk. The sum of these scores is used to establish a score that identifies the additional discount to be applied to the Carbon Quantification.

The additional discounts, resulting from the analysis of the risk levels specific to the Project, are cumulative with the uncertainty discount established in accordance with the provisions of the ORMEX STANDARD.

6.1 Risks associated with the human factor

6.1.1 Non-completion/delay in the deployment of Activities

The Project Holder must consider this risk in terms of the attractiveness of the Project (particularly in the context of a Government/Regional programme). The levels of investment required to implement the Practices, the financial/material incentives offered to the operator, and the expert support available to the operator. These factors are decisive in a farmer's decision to embark on changing his practices.

The Project Holder makes this analysis at the level of the Cropping System or Agrarian System. If, for example, a Cropping System has a component of easy access to water in the area under consideration, this category may be more inclined to embark on the implementation of a tree growing project. The level of investment and means of investment required to set up a crop rotation (access to seeds), then the level of income for the farmer depending on the crop, should also be considered.

The risk therefore essentially lies in the insufficient attractiveness of the programme, or in the case of a single or grouped project, in the actual delay in starting up the Project or its abandonment by the operator during the first 5 years of the Project.

Delays can also be caused by the non-delivery of seeds to start the project, obstacles to changing practices, and access to the resources needed to make these changes.

6.1.2 Stopping the activity

As the farms are already in place and the resources are in place, it is unlikely that the farmer will decide to stop farming, except in the case of unforeseen circumstances, external events or profitability problems.

6.1.2.1 Organisational risks: non-implementation due to lack of project monitoring

This risk is assessed on the basis of the human factors that could disrupt the organisation in place to monitor the Project. The extent of the Cropping System or the Agrarian System may also have an impact.

6.1.2.2 Technical risks

This risk may include situations where learning is not followed up, non-compliant practices are not applied, there is no technical support from an expert and checks are not carried out. The way the Project is organised and the programmes for passing on know-how in the farming zone must be considered.

6.2 Climate risks and natural disasters

The Project Holder analyses the risks associated with the climatic situation of the Cropping System and the impacts that may result from climatic hazards in the planting of trees, for example (storms, fires, floods). The measures taken to adapt to climatic hazards and changes must be considered, for example the resistance of species, planting methods, protection against the wind by hedges, ...

6.3 Biotic risks

The Project Holder analyses the level of risk due to pests and diseases.

6.4 Other risks linked to the socio-economic and political system

The Project Holder analyses the socio-economic and political risks that could have an impact on the implementation of the Project.

7 MONITORING, REPORING & VERIFICATION (MRV) REQUIREMENTS

The Project Holder must implement the Project monitoring, reporting and verification procedures required for the Verification Phases, as set out in this section.

7.1 Project monitoring objectives

If the perimeter of the Project is a large geographical area in the context of a private or public initiative, this requires the implementation of appropriate and effective Project monitoring to enable regular evaluation of the indicators and associated data, as well as monitoring of the maintenance of the assumptions made by the Project and the various objectives set.

This section therefore details the systematic assessment methodologies to be carried out with regard to the various Indicators, in particular those associated with soil quality, carbon quantification and the agroecological system to be promoted by the Project (chosen Ecosystem Objectives).

Periodic assessment of the Indicators is decisive for confirming that the Project is actually being carried out, monitoring the assumptions made and the positive impacts envisaged or estimated.

The assessment provides information about the state of the Indicator at the time of measurement, as well as the various changes made in comparison with previous measurements.

If the Indicators are assessed at shorter intervals, it will be possible to make rapid adjustments to the actions implemented to achieve the objectives set by the choice of the agro-ecological base. The frequency with which the Indicators are assessed will therefore depend on the objective chosen, the level of results expected and the resources deployed to achieve them.

This section indicates, for each Ecosystemic Objective, the associated Indicators, the frequency of assessment and the recommended methodology. The indicators are presented in the order in which the objectives are set out in ANNEX 3. INDICATORS FOR ECOSYSTEMIC CO-BENEFITS.

Certain Indicators are sometimes used to determine several objectives or SDGs.

7.2 Monitoring and evaluation methodology

The two monitoring and evaluation models proposed below are those put forward by the GTAE working group[43] . This evaluation proposal has been chosen by this Methodology because it is based on significant feedback from experience and strengthens the assessment of the determination of causal links between the Agroecological Practices implemented and the SDGs, while at the same time responding to a concern for simplification.

7.2.1 The choice of assessment level model

Depending on the model chosen by the Project for its monitoring and evaluation, the quality of the assessment of the effectiveness of the activities and the achievement of the objectives will not be identical.

The Project Holder is given the opportunity to choose between the 2 models depending on the level of quality of the monitoring and evaluation it wishes to have and make visible on the Project.

Model 1: Diagnosis: The Project Holder assesses the situation on a given date, then during the course of the Project, according to the intervals specified for each Indicator, then at the tenth year of the Project.

This model does not require a similar reference situation. The results obtained are compared

[43] L. Levard, et al., 2019)

with theoretical default data, or data for levels considered to be optimal, or progress commitments established at national level. This approach provides information on the progress of each Indicator between the different verification periods, but does not eliminate the bias according to which progress/degradation is insufficiently correlated with the implementation of Regenerative Activities.

Model 2: monitoring-evaluation system: this model requires a reference situation to be established (the situation that would have prevailed (or probably would have prevailed) if the project had not been implemented). The reference situation makes it possible to compare 2 similar situations (subject to similar constraints) with and without the implementation of Regenerative Activities. This model helps to determine the causal link between the implementation of the activities and the resulting improvement in the agroecosystem monitored (with/without). Monitoring throughout the project also makes it possible to track changes in the results of the activities themselves.

Model 2 is applied for the Quantification of the Carbon Balance, based on the determination of a Reference Scenario. However, the Reference Scenario is a scenario established on the basis of an estimated continuation of the historical situation.

For the other Indicators, the choice of model (and its feasibility) is made by the Project Holder according to the monitoring resources implemented by the Project Holder. The model chosen will be specified in the PDD.

If this is possible for certain indicators, the Methodology recommends following the monitoring and evaluation model referred to as "Monitoring-evaluation" by identifying an identical Cropping System without the implementation of Regenerative Activities. Failing this, a diagnostic follow-up is carried out. This diagnosis can be compared to a reference data bearing a national diagnosis or specific to the zone under consideration in order to determine the performance of the Project indicator in relation to this data.

7.2.1.1 The monitoring and evaluation model

The "monitoring-evaluation" methodology makes it possible to carry out an initial diagnosis of the situation - levers implemented/not implemented - which is useful for characterising the Reference Scenario. This is followed by monitoring changes in the Indicators (in relation to the benchmark) since the launch of the Project, at each Verification and at the end of the deployment period, then at the end of the Project on the basis of a diagnostic study.

It is possible for the Project Holder to follow the "Study-diagnosis" Model during the first phase of Project Verification. This model may also be applied for past periods of projects that have already begun at the date of certification, if the Project Holder has certain data enabling a diagnosis to be made of the situation at the start of the Project and the situation at the time of Certification/Verification of the Project.

In the absence of the necessary data, the Project Holder sets a diagnosis in its Report with a view to the first Verification, and undertakes within the framework of the Project to follow the monitoring-evaluation model. The initial diagnostic study is then compared with the results of the Impact formalised by the results of the indicators established by comparison with default data.

The scoring for each associated objective indicates the application of the "diagnostic" or "monitoring-evolution" Model and specifies whether the indicator has been established in the context of an "estimated" situation or in the context of "results" obtained in comparison with default data (Tier 1) or resulting from more precise data (Tier 2 or 3).

7.2.2 Representative sampling determined on a reasoned basis

Categorisation into Cropping Systems or Agrarian Systems makes it possible to identify the different types of agroecosystems that are most representative and to group them together in a coherent way.

In accordance with Section 3.2, the Project Holder must determine one or more Cropping Systems. Each System is a homogeneous whole. **For Past Started Projects, the categorisation will be elaborate and apply for the Verification of future vintage periods occurring after the Certification Date**.

The Project Holder can follow a grouping model of the different farms in the farming Area according to homogeneous components and variables, in order of questioning Cropping System. It can use existing an existing grouping model, establish a new one, or identify a grouping model per indicator. Components can be in relation with the agri-environmental criteria (like detailed soil typology, Soil degradation status, presence of AEI, closed Forests presence, land use history), or in relation to the farm (like average farm size, threshold of yield, livestock farm, number of staff, level of technical skills, the post-harvest system, the type of consumption/marketing system. Each component and associated variables have to be adapted according to specific geographical zone, history, or situation of the Agrarian System in order to make them more relevant to the agroecosystem envisaged by the Project.The indicators are monitored for each Cropping System and the data collected for a category by applying a representative sampling determined in a reasoned manner. This sampling must be the same throughout the timeline of the Project (data collected from the same farmers).

Proceeding in this way encourages a better intermediate and end-of-project diagnostic study, as well as a better understanding of the vectors of positive or negative influence of the Activities. If the Project Holder deems it necessary, atypical practices or situations can be isolated.

7.2.3 The participatory approach

As well as being an essential component of agroecological systems, the participatory approach is a decisive element in promoting, encouraging support for and enriching the Project and its participants by pooling feedback, taking better account of the constraints and obstacles to the Project, and ensuring that corrective action is taken in good time. This involvement must take place throughout the execution of the Project.

The Project Holder will detail the procedures for involving stakeholders in the Project. The involvement stages proposed by the GTAE working group[44] may be followed.

7.2.4 Assessment

Depending on the choice of Ecosystem Objectives, the PDD must specify Indicators for monitoring the Project in accordance with these objectives. During the Verification Phases, the results obtained from the calculations or findings made, together with the sources and evidence associated with these results, will be made available to the VVB for verification.

The Project Holder undertakes to answer the various questions asked by the VVB during the Validation and Verification phases. In the event of non-compliance identified by the VVB, the Project Holder must modify the design of the Project if it wishes to continue the Project within the framework of the Methodology.

The indicators to be monitored and the specific monitoring procedures for each indicator are set out in the ANNEX 3. -Indicators for Ecosystemic Co-benefits.

8 ADDITIONALITY REQUIREMENTS

8.1 Determining the Reference Scenario

8.1.1 General

In determining the Reference Scenario, the Project must describe the situation and use of the Surfaces at the start of the Project.

The Reference Scenario is the situation that would continue without the implementation of the Project. The Project Holder will detail:

[44] L. Levard, M. Bertrand, P. Masse (Coordination), Mémento pour l'évaluation de l'agroécologie, Méthodologies pour évaluer ses effets et les conditions de son développement, GTAE-AgroParisTech CIRAD-IRD, Mars 2019

- ✓ Land use and current practices as they are likely to continue in the Cropping/Agrarian System in the absence of the Project

It is considered that the use of a Surface Area for 3 years at the Start Date of the Project is a use that should continue. If a change of use is identified during these 3 years, the last use will be taken into account.

As the Methodology is adapted to national, regional or local Projects, and Projects which are grouped together, it may be difficult to define for each farmer whether the use at the Project Start Date is the use of the previous 3 years. If the use per Surface cannot be determined on a certain basis, the Project Holder must describe the assumptions considered which will enable it to determine the uses present in the Cropping System/Agrarian System and which will be taken into account in determining the Reference Scenario and the carbon quantification associated with this scenario.

Current practices are determined on the basis of the technical routes usually used. The Project Holder will specify the usual practices by referring to the elements of the historical diagnosis analysed to determine the categorisation.

The Reference Scenario must be reassessed when ORMEX recertifies the Project in accordance with the ORMEX Standard[45] .

The Project Developer details the assumptions made to justify the baseline scenario selected.

The NEXT tool is used to calculate the Carbon Balance by identifying the different land uses in the Reference Scenario.

8.2 Additionality

8.2.1 General

The Additionality of the Project must be demonstrated by applying the following 4 steps according to the principles of Additionality proposed by the ORMEX Standard[46] .

- ✓ Step 1: the probability of Additionality
- ✓ Stage 2: Demonstration of the absence of mandatory regulations
- ✓ Stage 3: Financial additionality
- ✓ Stage 4: Climate additionality

At each stage, the Project score must be specified.

[45] Section 10.2.3 - ORMEX STANDARD

[46] Refer to the ADDITIONALITY METHODOLOGY

8.2.2 Step 1: Probability of Project Additionality

This demonstration analyses 3 indicators: the financial attractiveness of the Project resulting from the implementation of the Project, the barriers to implementation, and the level of market penetration.

The Project Holder will detail the development context of the sector associated with the Project in the country in question and will determine how the Practices can have a positive impact on the attractiveness of the sector.

With regard to barriers to implementation, the Project Holder may point out the difficulties farmers have in obtaining funding, the situation regarding the development of knowledge and educational processes associated with agroecological practices, the various risks faced by farmers and the knowledge involved in agroecological practices.

By way of example, the following themes are examples of barriers that can impact on the change of Practices on arable farms:

- ✓ Difficulties in accessing land ownership in the medium and long term
- ✓ Problems with the competitiveness of the sector in relation to other sectors, and regional competition
- ✓ Difficulties specific to the nature of the crop
- ✓ Difficulties linked to the implementation of all or part of the Regenerative Activities
    - Reduction of mineral fertilisers: replacement of mineral nitrogen by organic nitrogen (spreading of organic resources)
    - Introduction of legumes in intermediate crops: despite the potential contribution to dietary diversification, the introduction of legumes requires good quality seed. In addition, the farmer has to manage weeds in these conditions, which requires good technical training
    - Reducing losses when nitrogen fertilisers are applied (by burying organic nitrogen fertilisers, burying mineral fertilisers in the soil, delaying the date of the first nitrogen application on straw cereals, etc.)
- ✓ The introduction of seed legumes or ferns (access to quality seeds and an agro-industrial system already organised in favour of major crops (from upstream to downstream) on the animal feed market (intensive production by agrochemicals and associated genetic selection): a significant incentive for change is needed
- ✓ Increasing the timeline of temporary grassland because short-term profitability is taken into account: loss resulting from the natural deterioration (evolution of the flora) of grassland that has not been replanted
- ✓ reducing the number of vehicles passing through

- ✓ Establishing and extending plant cover: economic cost as a barrier to implementation
- ✓ Keeping crop residues in the soil
- ✓ No economic reference, but ideas of additional risks favouring the development of certain diseases and pests. The straw is sold to livestock farmers, which reduces their income
- ✓ Spreading of fertilising materials of residual origin (MAFOR): an increase in the input of organic residual products (PRO) from livestock effluents or any MAFOR (including green waste and urban sludge) generates a cost
- ✓ Principles of risk aversion, difficulties in gaining real knowledge of nutrients and agronomic value, so preference for industrial mineral fertilisers, low availability of products
- ✓ The regulatory context associated with production is more restrictive than for other crops
- ✓ Certain technical impasses (pathogenic)
- ✓ Economic barriers to planting
- ✓ Problems attracting young people to the sector

8.2.3 Stage 2: Demonstration that there are no mandatory regulations

The Project must demonstrate that the Regenerative Activities on field crops are not the result of mandatory regulation. The Project Holder will identify the frequency of monitoring of this condition according to the assessment table proposed by the Additionality principles proposed by the ORMEX Standard, and the demonstration elements used.

8.2.4 Stage 3: Financial additionality

The Project Holder will detail the financial model implemented as part of the Project, specifying the public subsidies already available to operators and the initial investment requirements for implementing Regenerative Activities (level 1, 2 or 3).

The share of revenue for the operator resulting from the sale of carbon credits (or national subsidies resulting from joining the programme) must be specified and identified as a determining factor in the implementation of the Project.

Financial additionality will be demonstrated if the share of revenue associated with the sale of carbon credits exceeds 30% of the operator's revenue.

For a Government/Regional or Local Project, the Project must allocate at least 30% of the revenue associated with the sale of carbon credits to financial or material subsidies allocated to the farmers participating in the Project.

8.2.5 Stage 4: Climate additionality

The Climate Additionality is based on a comparison of the Carbon Balance calculated for the Reference Scenario and the Project Scenario.

ANNEX 1. LIST OF DEFINITIONS

The following terms used in this document have the meanings given below.

terms	Definitions	Further information Identification of Sources
Additionality	Refers to the demonstration of Regulatory Additionality, Financial Additionality, Barriers Additionality, and Climate Additionality, and the positive results of such demonstration, required in section 8.3.2 of the ORMEX STANDARD PRINCIPLES AND REQUIREMENTS. The demonstration shall be conducted in accordance with the ADDITIONALITY METHODOLOGY	
Agrarian System	refers to the functioning of a type of agriculture in relation to a human society in a given environment.	
Agricultural sector	Refers to a chain of players (producers, processors, distributors) involved with the same agricultural raw material and with a common medium or long-term development project. The interdependencies between these players may be financial, economic, regulatory, technical, social or environmental.	L.Bockel, F.Tallec, L'approche filière : Analyse fonctionnelle et identification des flux, FAO, 2005, Published EASYPol
Agroecology	Refers to *"a holistic and integrated approach that simultaneously applies ecological and social concepts and principles to the design and management of sustainable agricultural and food systems. [...] . Today it represents a transdisciplinary field that includes the ecological, socio-cultural, technological, economic and political dimensions of food systems, from production to consumption"*. It is internationally recognised as an *"innovative approach and a relevant tool for the transition and transformation of the agricultural and food system, in particular through its desire to understand the interdependent processes specific to a given scale"*.	Agroecology Knowledge Platform | Food and Agriculture Organization of the United Nations (fao.org) HLPE, Agro-ecological and other innovative approaches for sustainable agriculture and food systems to improve food security and nutrition. Report of the High-Level Panel on Food Security and Nutrition of the Committee on World Food Security, Rome, 2019

Agroecological infrastructure (AEI)	Semi-natural habitats that do not receive fertilisers or pesticides.	
Agroforestry	Refers to the techniques and system of land use in which perennial woody plants (trees with a density of less than 100 trees/hectare (forestry), shrubs, vines, bamboo and other woody plants) are deliberately used on the same land management unit (a plot) as agricultural crops or livestock, in spatial arrangement or temporal sequence. There is no change in land use.	Definition based on the World Agroforestry Centre definition.
Areas	Refer to the geographical areas included in the Cropping System, according to the Methodology.	
Chemical degradation	Refers to the deterioration in the chemical composition of the soil, due to the loss of nutrients and/or organic matter, or to salinisation, acidification or pollution.	
Cropland	Land cultivated for food.	IPCC 2006 Guidelines for National Greenhouse Gas Inventories, Volume 4, Agriculture, forestry and other land uses, Chapter 3, Consistent representation of land.
Cropping system	Refers to an agricultural system with a homogeneous set of components and technical methods used on Plots treated in an identical way..	
Forest	Refers to land with woody vegetation that meets the thresholds used to define forest land in the national greenhouse gas inventory. It also includes systems whose vegetation structure is currently below the threshold values used by a country to define the forest land category, but which could potentially reach them in situ.	
Hedgerows	Refer to "*linear plantation around the fields, including shelterbelts, windbreaks and live fences*".	Rémi Cardinael et al 2018, Revisiting IPCC Tier 1 coefficients for soil organic and biomass carbon storage in agroforestry systems (Environ. Res. Lett. 13 124020)
Physical degradation	Refers to deterioration such as the compaction, crusting and sealing, waterlogging and subsidence of the soil.	

Plantation	Refers to a main crop grown on cultivated land previously allocated for this purpose.	
Plot	Refers to all or part of a plot of land on which one or more crops are grown in association.	
Ploughing on ridges *Ridge-till*	This is a practice known as "conservation" in which the soil is worked less. The soil is left untouched from harvesting to planting, with the exception of strips up to 1/3 the width of the row. Planting is carried out on the ridge and generally involves removing the upper part of the ridge. Residues are left on the surface between the ridges.	Planting is carried out using brooms, disc openers, ploughshares or row cleaners. Weeds are controlled using plant protection products (often in strips) and/or cultivation. The ridges are rebuilt when the crop is grown in rows.
Project start date	Refers to the date (year) established in accordance with the provisions of Section 3.1 of the Methodology from which the Project is identified as having started.	
Regenerative Activities	Refers to the regenerative practices specified in section 2.6 and ANNEX 2. . of the Methodology.	
Semi-direct seeding (SD)	Refers to a semi-domestication technique in which the soil is not turned over beforehand and is not mixed. SD is defined by working only on the sowing line and not on the width of the drill.	
Semi-direct seeding over plant cover (SDCV)	Refers to sowing with ground cover, either permanent live cover or dead plant cover (using crop residues or reduced intermediate crops).	
Soil degradation	Refers to a change in the state of health of the soil that leads to a reduction in the ecosystem's capacity to provide goods and services for its beneficiaries. Degraded soils are in such a state of health that they do not provide the usual goods and services of the soil in its ecosystem. The degradation is related to Physical or Chemical Degradation of the soil, and/or by Soil erosion.	FAO, Degradation/restoration | Soil information portal | Food and Agriculture Organization of the United Nations (fao.org)
Soil erosion	Refers to the displacement of soil materials by water run-off, rain, wind or other factors, resulting in a thinning of the arable layers.	
Strip-till	Refers to the operation of working the soil in strips 15 to 25 cm deep corresponding to the future seed rows. The	This practice encourages water to flow towards the

	parts not worked (inter-rows) are covered with plant residues on the surface.	crops, increasing the supply of nutrients.
Surface Or Project Surface	Refers to the sum of the Areas (or Zones) included in the Project Boundaries, according to the Methodology.	
Stubble ploughing	Refers to the operation of burying stubble, while simultaneously working the soil by spraying to prepare for sowing, breaking the crust and destroying weeds.	

ANNEX 2. REGENERATIVE ACTIVITIES

This ANNEX details the Regenerative Activities for the different levels 1, 2 and 3.

Regenerative Activities include cultivation practices and technical paths.

Cultivation practices

Cultivation practices revolve around different activities that take place in the various technical areas associated with the crop in question.

Practices can be grouped:

- ✓ Soil management
- ✓ Cover crops and intercropping
- ✓ Soil treatment
- ✓ Crop rotation and diversification
- ✓ Seeds
- ✓ Agroecological structures
- ✓ Water management
- ✓ Manure/organic inputs
- ✓ Pollination

The Project can reference an existing technical pathway by demonstrating its suitability for practices.

In any event, the Project must demonstrate, for the areas under consideration, the implementation or its intention to implement Regenerative Activities and be in line with one of the levels of agroecological objectives so that the areas can be taken into account in the quantification of the Carbon Balance.

It is often unlikely that the practices can be implemented immediately. Depending on the context, they often require learning and training needs, intermediate implementation time, time to receive seeds, access to water, etc. If this is the case, the Project Holder must propose a project plan presenting a phasing of the implementation of the practices at the Agroecology level chosen within Implementation Years.

Reduced tillage

There are a number of practices that lead to a reduction in tillage operations compared with "conventional" ploughing. Ploughing is undoubtedly the oldest tillage technique, involving opening up the topsoil and turning it over before planting seeds.

The Methodology refers to a reduced tillage activity considered to be a "conservation" practice. This type of practice normally refers to tillage systems that do not turn the soil over, and that keep crop residues on the surface in order to optimise soil and water conservation.

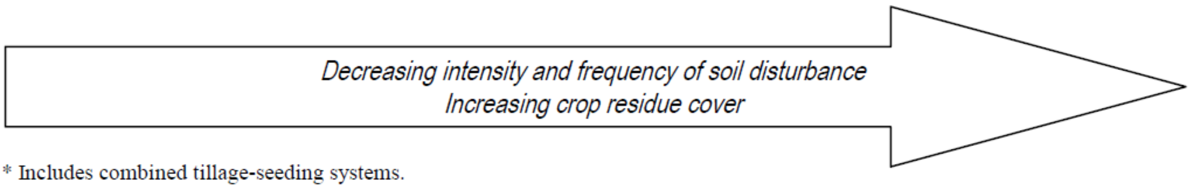
- ✓ This refers to any tillage or planting system in which at least 30% of the soil surface is covered by plant residues after planting in order to reduce erosion (water or wind).

These practices vary according to the type of tools used, and the frequency and intensity of deep cultivation.

The following figure (taken from the Farmer Field Schools Guidelines - Module on Tillage, 2021) published by the FAO shows the types of practice eligible for level 1 in the green box. Levels 2 and 3 correspond to zero tillage. Zero tillage means not ploughing between harvesting and sowing the next crop.

Figure 1: Tillage systems classified according to the degree of disturbance to the soil and the surface cover of residues

Conventional tillage		Non-Conservation Tillage	Conservation tillage				
Mouldboard plough	Disc plough	Reduced tillage	Ridge Tillage	Reduced* Tillage	Tine Tillage	Strip Tillage	Zero Tillage



* Includes combined tillage-seeding systems.

Source:FAO-IITA, 2000

Methods that involve working the soil superficially (at a depth of 5 to 15 cm), without turning the soil over, but allowing crop residues to be mixed, leaving some on the surface (at least 30% of the soil surface is covered by plant residues) are taken into account (stubble ploughing). Strip-till is also a recommended practice for level 1.

The Methodology is therefore in line with the general definitions given by the IPCC. The default values proposed by the NEXT tool are given in the following table, which reproduces table 5.5.

Tillage (F_{MG})	Full	All	Dry and Moist/Wet	1.00	n/a	Substantial soil disturbance with full inversion and/or frequent (within year) tillage operations. At planting time, little (e.g., <30%) of the surface is covered by residues.
Tillage[7] (F_{MG})	Re-duced	Cool Temperate/ Boreal	Dry	0.98	±5%	Primary and/or secondary tillage but with reduced soil disturbance (usually shallow and without full soil inversion). Normally leaves surface with >30% coverage by residues at planting.
			Moist	1.04	±4%	
		Warm Temperate	Dry	0.99	±3%	
			Moist	1.05	±4%	
		Tropical	Dry	0.99	±7%	
			Moist/Wet	1.04	±7%	
Tillage[7] (F_{MG})	No-till	Cool Temperate/ Boreal	Dry	1.03	±4%	Direct seeding without primary tillage, with only minimal soil disturbance in the seeding zone. Herbicides are typically used for weed control.
			Moist	1.09	±4%	
		Warm Temperate	Dry	1.04	±3%	
			Moist	1.10	±4%	
		Tropical	Dry	1.04	±7%	
			Moist/Wet	1.10	±5%	

Figure 23 - IPCC 2006, revision 2019, Volume 4 - Chapter 1 - Table 5.5 Factors of variation of relative stocks F_{MG} (Over 20 years).

The practice of reduced tillage or zero tillage, depending on the level chosen, must be applied to the entire surface area of the Plots in the Cropping System and for the entire timeline of the Project. The practice of reduced tillage or zero tillage practised occasionally on certain plots cannot be implemented as part of the Methodology.

Level 2 and 3 zero tillage practices mean that planting is carried out using semi-direct tillage (including semi-direct tillage under cover).

➢ Crop association – diversity - rotation

The Project must implement polyculture on the Plots, by diversifying and combining Crops. These cropping practices are required for the 3 levels of Agroecological Activities. Alternating family crops and different sowing periods are one of the ways of managing weeds in order to compensate for the reduction and absence of ploughing.

The introduction of crop diversification (rotation, plant cover or intercropping) leads to the production of biomass, which is needed to feed the soil and therefore achieve better yields, while limiting the use of fertilisers and plant protection treatments that can harm biodiversity and the health of farmers.

➢ Cover crops, intercropping and mulching

Level 1 requires a minimum amount of mulching.

Levels 2 and 3 require continuous plant cover (between the rows) using food crops, legumes or grassland.

- **Harvest residues returned**

See the section on "tillage".

- **Agroecological structures**

Level 1 requires the maintenance of agroecological structures associated with the Plots (Single and closed Grouped Projects) or in the agroecosystem (Grouped and Government/Regional Projects).

Level 2 involves improving the coverage rate of agroecological structures, and/or creation or implementing agroforestry projects on all or part of the Plots.

Level 3 combines level 2 with a pollination project and manure treatments.

- **Soil treatment - reducing mineral inputs - manure**

Level 1 requires the Project Holder to focus on implementing practices that optimise mineral nitrogen (N2O) inputs by making better use of organic nitrogen and avoiding losses. The implementation of nitrogen-fixing plantations is also requested. The Project Holder is asked to reduce mineral inputs (N2O) at least by 50% at the Target Scenario.

In the tropical countries and for some of the crops (e.g. Coton) a minimum of Nitrogen is still required. This minimum was determined by INRAE specialists as 50 kg per hectare. In the case of a Project Holder located in Tropical countries and using nitrogen within this minimum amount, then a reduction of this fertilizer is not required. The only reduction accepted is to the level of 50kg per hectare as a minimum for the Levels 1 & 2.

- **Water management**

It is necessary here to determine the water management methods as they will be implemented as part of the Project. They may be identical to or different from the systems identified for the diagnosis of the Cropping System.

In any case, the Cropping System/Agrarian System will specify a homogeneity in the historical management of water on the Plots and that will be implemented by the Project.

ANNEX 3. INDICATORS FOR ECOSYSTEMIC CO-BENEFITS

This ANNEXE details each Ecosystemic Co-Benefit Indicators and specifies the links with the SDGs.

The data for all the following Indicators must therefore be collected and monitored at the intervals specified for each Indicator.

➢ MAINTAINING/IMPROVING AGRICULTURAL YIELDS AND THEIR REGULARITY

Agricultural yield and its regularity are Indicators that make it possible to assess the productive efficiency of the Practices implemented, with regard to a farm or a category of farms in the Farming Area. These Indicators are important factors in encouraging farmers to start implementing the Practices. Annual monitoring is used to assess changes in the capacity or otherwise of the agroecological cropping system to enable regular production. It also identifies the effects of the Practices in the face of climatic hazards or various biotic factors (diseases, pests, etc.).

The following tables detail each indicator and sub-indicator to be monitored.

2 LINK WITH THE SDGs

1.5. Strengthening of populations' resilience
> Regularity of yield

2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers
> Yields, crop and animal production

2.4. Ensure sustainable food production systems
> Regularity of yield

➢ Plant production yield

Criteria	Monitoring crop yields
Indicators	• Yield per production cycle (dry matter) (i) for fruit and (ii) for each intercrop (grains/tubers, etc.) • Land Equivalent Ratio: determination of the performance of associated crops compared with the same species if they were grown separately. • Yield of forage/straw or crop residues per production cycle (kg of dry matter/hectare)

	• Above-ground and/or root biomass returned to the soil per year (Kg/hectare/year)
Unit	Kg/hectare
Analysis level	The surface area (Useful Agricultural Area) of a Typical Parcel by Farm Category Possibility of including or excluding ecological infrastructure (hedges, trees, vegetated strips, etc.) (to be specified as appropriate)
Frequency	Annual
Collection	Economic surveys carried out in the Farming Area or data from a questionnaire for data associated with fruit production, or sampling methodology for intercrop data.
Sources	National/regional/local public databases Public surveys - operator questionnaire - sampling
Methodology	Sampling method for intercrops: 2 to 3 sites representative of contrasting areas that can be precisely identified in the plot. The areas to be sampled at each site vary from 2 to 10 m2 depending on the crop and sowing technique.) Within this area, all intercrop plants are cut at ground level. (For further information, see Methodology, *L. Levard, p35)*

➢ Monitoring regularity of performance

Criteria	Monitoring regularity of performance
Indicators	• Coefficient of variation of the average interannual agricultural yield • Weight of animals for sale/own consumption in relation to livestock area • Quantity of manure collected in relation to livestock area
Unit	• Coefficient • Kg/hectare/year

Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category Livestock area of a typical plot by farm category
Frequency	Annual
Collection	Economic surveys carried out in the Farming Area or data from a questionnaire for data associated with fruit production, or sampling methodology for intercrop data.
Sources	National/regional/local public databases Public surveys - operator questionnaire - sampling
Methodology	(Levard, 2019, p. 34-36).

➢ MAINTAINING/IMPROVING SOIL HEALTH

To assess the maintenance or improvement of soil health, i.e. its functions (erosion control, decomposition and recycling of nutrients, regulation of pathogens), in relation to the implementation of the Practices, we need to have a reference situation.

It is proposed to compare the improvement with a comparable plot without implementing the Practices or with the soil health situation of this plot at t0, and then every 3 years by monitoring changes and comparing with average public data associated with the location of this plot.

The Project Holder indicates the soil functions, Indicators and environmental benefits that it intends to achieve as part of the Project and which will be monitored with regard to the main objective of Core 1. The Project Holder must monitor at least 3 Indicators (the criterion associated with monitoring soil organic matter is compulsory).

2 LINK WITH THE SDGs

2 ZERO HUNGER

2.3 relating to increase of agricultural productivity and incomes of small-scale food producers

2.4 relating to ensuring the sustainability of food production systems and implementation of resilient agricultural practices

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

12.2 relating to achieving sustainable management and efficient use of natural resources

13 CLIMATE ACTION

13.1 relating to strengthening in all countries of resilience and capacities to adapt to climate-related hazards and climate-related natural catastrophes

15 LIFE ON LAND

15.1 relating to ensuring conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services

15.3 relating to the fight against desertification and restoration of degraded land and soil

➢ Monitoring the physical properties of the soil

Criteria	Monitoring the physical properties of the soil
Indicators	• Ground surface conditions • Water infiltration • Structural state of a soil • Aggregate stability
Unit	• % of "open", "closed" and "covered" soil surfaces in a plot (Kg/hectare/year) and/or Penetration index • Average infiltration speed of water poured into a cylinder • Visual index of soil structure (VESS) • Index of manual crushing of aggregates and/or Index of disintegration in water
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category

Frequency	T0 (LP), then every 3 years.
Collection	Sampling
Sources	National/regional/local public databases for T0 or sampling by farm category Sampling
Methodology	(Levard, 2019, p. 34-38).

- Monitoring soil organic matter (mandatory)

Criteria	Monitoring organic matter in the soil
Indicators	• State of decomposition of plant residues and macrofauna activity • Mesofauna activity status • Condition of organic matter
Unit	• Index of the state of litter decomposition and macrofauna activity ("Litter index") • Tea bag test • Organic carbon content (see Carbon quantification section)
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category
Frequency	T0 (LP), then every 3 years.
Collection	Sampling
Sources	National/regional/local public databases for T0 or sampling by farm category Sampling
Methodology	(Levard, 2019, p. 34-38). Chemical analysis of the organic carbon content, using the international standard methodology NF ISO 14235. The organic matter content is calculated by multiplying the carbon content by a coefficient that is stable in regional cultivated soils, set at 1.72 (OM = Cx1.72).

➢ Monitoring nutrient recycling

Criteria	Monitoring nutrient recycling
Indicators	• Quantity and availability of nutrients for plants • Chemical constraints on soil nutrient availability
Unit	• Plant colour index • pH, aluminium content, clay content and type of clay
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category
Frequency	T0 (LP), then every 3 years.
Collection	Sampling
Sources	National/regional/local public databases for T0 or sampling by farm category Sampling
Methodology	(Levard, 2019, p. 34-38).

➢ Monitoring soil biodiversity

Criteria	Monitoring soil biodiversity
Indicators	• Diversity and abundance of harmful and useful macro-invertebrates
Unit	• Density per unit area of traces of macrofauna activity • Abundance of macro-invertebrates that are useful or harmful to cultivated plants • Density of invertebrate pest attacks on cultivated plants
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category
Frequency	T0 (LP) and at least once every 5 years
Collection	Sampling

Sources	National/regional/local public databases for T0 or sampling by farm category Sampling
Methodology	(Levard, 2019, p. 43-47).

- **CARBON BALANCE MONITORING**

This indicator is a soil health and carbon balance indicator.

The Project Holder may decide to use a Tier 1 or Tier 2 Methodology recommended by the IPCC guidelines, volume 2. The Tier 1 Methodology uses default values resulting from recognised data sources.

It is recommended that the Project Holder follow a Tier 2 Methodology based on data more suited to the Project.

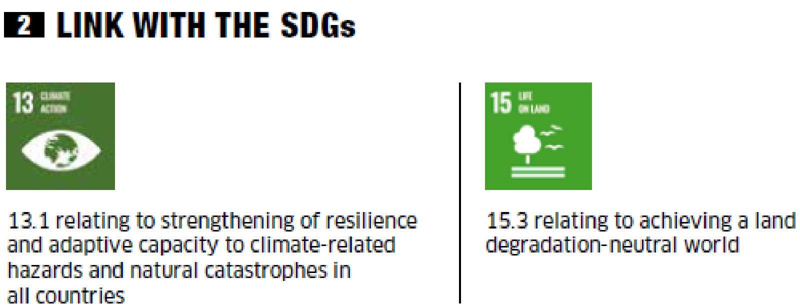
The Project Holder may decide to carry out verifications based on the Tier 2 Methodology, resulting in data that is better suited to the situation of the Project, even if the Project Holder has chosen to establish the initial Quantification on a Tier 1 basis.

The Project Holder monitors this Indicator every **5 years** using a Tier 2 Methodology, involving data resulting from the results of analyses of samples taken in the Exploitation Zone in question.

For soils identified as degraded at T0, soil quality will be monitored every 3 years and the Project Holder will carry out a Carbon Balance assessment using a Tier 2 Methodology at the same time.

Soil sampling must be done within 20-30 cm in the soil and privileging 30 cm.

The Project Holder must draw up a soil quality verification plan. To do this, they can use tools



such as those proposed by [Home SOC (worldagroforestry.org)](http://worldagroforestry.org), or draw up their own soil analysis plan based on ISO 18400 standards.

Criteria	Carbon Balance
Indicators	• Average rate of carbon sequestration in soils • Balance of GHG sinks and sources for all the compartments of a farm: SOC
Unit	• T CO_2 eq.
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category or by sampling categorisation in the Farming Area.
Frequency	at least once every 5 years
Collection	Sampling
Sources	Tier 2
Methodology	(Levard, 2019, p. 43-47) ISO 18400 - 101

- Efficient use of water resources and nutrients

Surface conditions, runoff barriers, dead or living plant cover, etc.) will have a major impact on the efficiency of rainwater and nutrients. Situations differ depending on whether you are in a dry or wet zone.

- WATER USE EFFICIENCY

Criteria	Water use efficiency
Indicators Sub-indicators	**Elements of the water balance for a crop cycle** • Indicator of the timing of sowing in relation to the start of the rainy season (used to analyse whether practices allow earlier sowing dates (dry zone). • Rainwater productivity: Food production-biomass (kg/m3) • Productivity of infiltrated water (efficiency of available water) • Rate of water "loss" from the agroecosystem (runoff, deep infiltration, evaporation) (Optional) • Rate of water conveyance to fields in irrigated systems (Optional)
Unit	• According to Indicators **Calibration indicator** = Sowing date/wintering start date **Average runoff rate:** this can be obtained from charts or tables showing the rate as a function of soil type, slope and type of management practised (see FAO Bulletin 57 and 69).

	Evaporation = potential evaporation (linked to the soil) regulated by the rate of cover. - Rainwater efficiency = production in kg/total rainfall over the crop cycle - Usable water efficiency = production in kg / (total rainfall - runoff - deep infiltration - evaporation) - Irrigated water efficiency = production in kg / mm of water applied - Nitrogen and phosphorus efficiency - Overall efficiency of nitrogen or phosphorus use: production in kg/input of N or P - Efficiency of nitrogen or phosphorus supplied in the form of mineral fertiliser: production in kg/ input of N or P fertiliser - Annual nitrogen balance at farm level: (N input*-N output**)/Farm area *(*)Nitrogen input: total quantity of nitrogen purchased: mineral fertiliser, manure, livestock, livestock feed, etc.* *(**)Nitrogen output from the system in the form of products sold or consumed: crop products, livestock, milk, manure, etc.*
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category or by so-called categorisation in the Farming Area.
Frequency	Once a year
Collection	According to the methodology used
Sources	According to the methodology used
Methodology	(Levard, 2019, p. 52-56). Cf Different situations in wet and dry areas. Methodologies for identifying the average runoff rate in dry areas

➢ NITROGEN AND PHOSPHORUS USE EFFICIENCY

Criteria	Nitrogen and phosphorus use efficiency
Indicators	**Nitrogen and phosphorus balance** • Food production/biomass per unit of nitrogen or phosphorus used (efficiency in relation to total exogenous nitrogen or phosphorus supplied, mineral fertiliser nitrogen or phosphorus, organic nitrogen according to the different forms supplied). • Annual nitrogen or phosphorus balance (N or P input - N or P output)/Agricultural area
Unit	• According to Indicators
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category or by sampling categorisation in the Farming Area.
Frequency	Annual
Collection	According to the Methodology used
Sources	According to the methodology used
Methodology	(Levard, 2019, p. 52-56).

- **EFFECTIVENESS OF PEST AND DISEASE REGULATION**

Monitoring the regulation of pests and diseases is crucial for assessing the maintenance of food safety in the Farming area. This regulation concerns all organisms harmful to crops (insects, mites and nematodes (R), pathogens (fungi, viruses, bacteria) responsible for diseases (P), or parasitic weeds (A)).

It is recognised that intensive farming practices encourage the rapid development of pests and diseases by creating large areas of homogeneous crops. Pests are much more abundant in monocultures than in intercropping. The systematic application of pesticides has a paradoxical effect: it immediately reduces pest populations but also causes a reduction in the populations of competing insects, predators and parasites, which can sometimes ultimately lead to an increase in the pest population. Some pests also adapt to the products used (weeds that become tolerant to herbicides, etc.).

By regulating pests and diseases through appropriate cultivation practices and the use of natural products, the risks of exposure of producers and consumers to synthetic chemicals, which are harmful to health either directly through their handling or indirectly through the consumption of their residues in food, can be greatly reduced. For farmers, alternative pest control methods also help to reduce their dependence on external inputs, thereby limiting their level of indebtedness, as very few producers are able to pay cash for their inputs.

The presence of auxiliary insects is an essential criterion in terms of agro-ecological control and, what's more, biological control of insects. It is optional for the Project Holder, and it may be achieved by observing their presence in crop plots or by implementing any other appropriate methodology. In this case it is possible to assess whether the cultivation and farm implemented management practices encourage the development and action of this auxiliary fauna, which is essential in the natural fight against pests and diseases

It is proposed that the situation regarding the regulation of bio-aggressors should be assessed in terms of control (natural or chemical), the maintenance of biodiversity and the ability of farmers to adapt their control practices.

Indeed, the basic principle of any intervention to combat pests and diseases is to enable rural families to become more autonomous in relation to external agricultural advisers, who are often tied to projects or who do not have sufficient resources to ensure an effective permanent presence among farmers. For this reason, it is essential to train farmers and then measure the percentage of people (men and women) who are capable of carrying out agroecological pest control measures themselves.

Agroecological or even biological pest control is not an easy or straightforward process to implement, as it requires a minimum of knowledge and technical skills, which are often not available. It can reduce pressure, but does not always succeed in exterminating bio-aggressors, so the risk remains. The main costs are linked to the use of specialists to train agricultural advisers and relay farmers who will be responsible for supporting producers.

2 LINK WITH THE SDGs

2.3 relating to agricultural productivity and the incomes of small-scale food producers
> Effectiveness of pest and disease control

2.4 relating to sustainability of food production systems and implementation of resilient agricultural practices
> Maintenance of biodiversity

2.5 relating to preservation of genetic diversity of seeds, crops and farmed and domesticated animals and their related wild species
> Farmers' capacities

1. relating to elimination of extreme poverty and hunger

➢ Effectiveness of pest control

Criteria	Effectiveness of pest control
Indicators	Level of crop infestation (parasitism rate) • R: % of plants attacked • P: % diseased plants • A: % of soil covered by parasitic weeds Risk of damage (optional) • (R-P-A): % risk of loss of return 1. Damage less than the cost of treatment (non-dominant pests) 2. Damage greater than the cost of treatment Presence of auxiliary insects (diversity) • Diversity and number of beneficials
Unit	• **Infestation rate:** %. • **Risk of damage:** % of crops destroyed or affected • **Auxiliary diversity:** number of varieties and number of auxiliaries
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category or by sampling categorisation in the Farming Area.
Frequency	Annual

Collection	**Infestation: Visual observations and counts** • **R** and **P**: Visual observation of leaves, roots, stems and fruit • **A**: Visual observation of the level of parasitic weed cover in the plot **Risk of damage** - damage observed or risk of damage ≤ the cost of treatment (non-dominant pests): the farmer can refrain from taking action (manually, mechanically or chemically) and thus control the cost of cultivation, - the damage observed or the risk of damage incurred ≥ the cost of treatment (dominant bioaggressors), the farmer must intervene to save his production and adopt the most appropriate method of intervention given his financial and human resources. - Collection of beneficials and non-flying pests by beating randomly selected plants in the plot, followed by a visual count. - Harvesting of beneficials and flying pests using a fine net covering the selected plants
Sources	Visual observation, other considering the methodology
Methodology	(Levard, 2019, p. 52-56).

- Maintaining above ground biodiversity

Criteria	Maintaining above ground biodiversity
Indicators	**Level of development of ecological infrastructures** (hedges, trees, grass strips, crops, varieties, etc.) • **Density**: % of perennial plant stand • **Varietal and crop diversity**: Number of natural and cultivated plant species • Length of infrastructure in linear metres • % of host plants for beneficials (optional) • % of trap plants for pests (optional)
Unit	%
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category or by sampling categorisation in the Farming Area.

ORMEX
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SAS, RCS PARIS: 888 173 218
TVA number: FR88888173218
contact@ormex.org - www.ormex.io

Frequency	Annual
Collection	**Visual observations and counts** • **Density**: number of perennial plants on the farm in relation to the total surface area of the farm. • **Diversity**: counted at farm level, recorded in the local language by farmers, then converted into botanical names by agricultural advisors (technicians and engineers). • **Length (windbreak hurdles)**: in decametres or "calibrated paces" easily convertible into metres • **Host plants and traps**: measurement at farm level with a farm advisor
Sources	Visual observations
Methodology	(Levard, 2019, p. 57-61).

➢ Farmer capacity on pests' control

Criteria	Farmers' capacity
Indicators Sub-indicators	**Capacities acquired % of farmers able:** • Identify the main pests and diseases of their crops (R-P-A and beneficials) • Assess risks (predictive capacity) • To decide independently whether or not to treat (non-systematic) depending on the level of infestation (R-P-A) • To apply alternative control methods and prophylactic measures through cultivation practices
Unit	%
Analysis level	The surface area (Useful Agricultural Area) of a typical parcel by farm category or by sampling categorisation in the Farming Area.
Frequency	Annual
Collection	Farm advisor survey % of farms in the Farming Area (or sample area) with at least one suitable person/sub-indicator

Sources	Survey
Methodology	(Levard, 2019, p. 52-56).

➢ SOCIO-ECONOMIC OBJECTIVE INDICATORS

➢ Farm yields according to stakeholders

Monitoring farm yields and keeping track of them over the short, medium and long term is a key factor in assessing the impact of changing practices and promoting them. The economic performance of the farm, increased self-sufficiency and food and nutritional security must not be undermined by the implementation of new practices. Stakeholder monitoring of farm yields is based on questioning the farmer.

The monitoring is carried out on one (or more) representative plot(s) with regard to the categorisation of the sampling in the Farming Zone, in order to obtain a series of results by type of harvest for farms growing the same type of crop in association.

The following questions are proposed:

- ✓ What was the yield (or production) of the last harvest (or, in the case of combined crops, the yields of the last harvests of each of the crops in the crop association)?
- ✓ Qualification of the last harvest(s): was it an average, good or bad harvest?
- ✓ What was the yield (or production) in previous years (2 years, 3 years, 5 years)?
- ✓ Qualification of changes in yield (or production) from one year to the next: slight improvement, average improvement, significant improvement, deterioration (in the event of deterioration, request an assessment of the cause(s)).
- ✓ The level of average yield (or production) on this same plot when it was set up, or when it began to be used with this crop (corresponding date) and the implementation of the Practices, and his opinion on the causes of the change observed over time.
- ✓ The level of yield (or production) of by-products (straw, etc.)

If the operator does not know the yields or uses a different unit of measurement, the data will be collected in the unit of measurement used by the operator. The conversion will be carried out later as part of the data processing.

For harvests spread out over time, sold quickly or consumed on the spot, the data to be used depends on the type of harvest:

- For intercrops and successive harvests: the number of days or weeks harvested and the quantity harvested per day or per week,
- For fruit trees: the number of trees and the estimated number of fruits produced per tree,

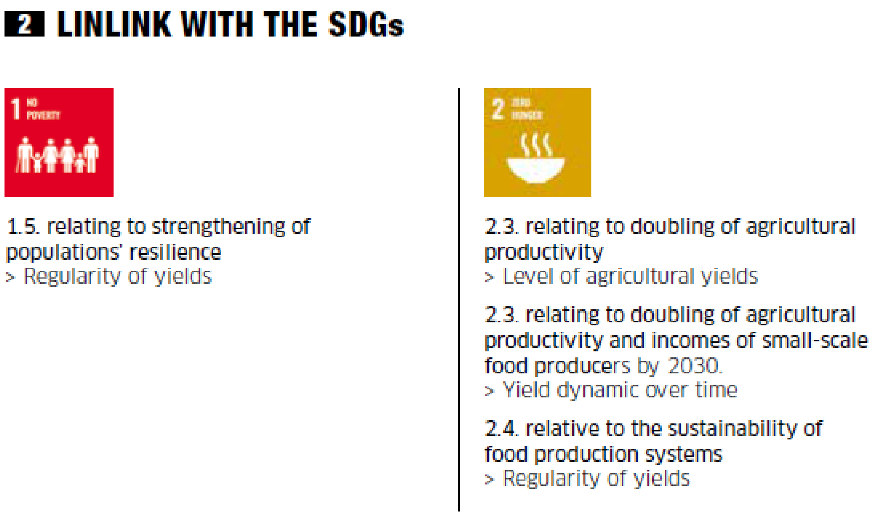
- For products consumed immediately: the quantity consumed

The performance of the associated livestock is not monitored.

Results are expressed in:

- Average results/Category
- In the event of significant differences in the data collected for a given Category, a range of results must be indicated.
- Standard deviations can be calculated for each type of production or crop system

For monitoring and evolution, the assessment of the initial reference yield is to be carried out on the same farms in the sampling by Category, taking into account the yields of the last 2 harvests (question asked of the farmer or yield information already known for the farm), as well as that of the harvest(s) of the year in which the Practices were implemented. It should be borne in mind that the effects of the Practices on farm yields are not yet significant in the first year.



Criteria	Yields according to stakeholders
Indicators Sub-indicators	**Average farm yield** • Quantity of agricultural production(s) / unit area / production cycle in an average year (generally in tonnes/hectare) • Quantity of by-products / unit of agricultural area / per production cycle

	Regular yields • Average performance levels/Category • standard deviation by Category • range of results • Yield in a bad year and yield in a good year and differences • risk of return below a certain level **Dynamics of performance over time (evolutionary trend)** • Average change and rate of change in average yield over five or ten years
Unit	Tonnes/ hectare
Analysis level	Use of the sample identified by farm category
Frequency	Reference situation: t-2 years + year in which Practices began (t) Then t+ 3 years, t+ 5 years, t+10 years, then every 2 years
Collection	**Surveys carried out by the** agricultural **adviser** Comparison with yields
Sources	Farmers
Methodology	(Levard, 2019, p. 63-69).

➢ Economic performance from the farmer's point of view

Assessing value added and income creation at farm level makes it possible to assess the share of value creation (excluding subsidies) resulting from agricultural production in the area, with regard to the effects that may be associated with changes in Practices.

It is first necessary to identify by Category the cropping successions characteristic of the cropping system taken into account in the sampling for each Category. (e.g., year 1 sorghum-bean association, etc.).

2 LINK WITH THE SDGs

1.1. relating to elimination of extreme poverty
> Economic performance and generation family agricultural income

1.2. relating to reduction of poverty
> Economic performance and generation of family agricultural income

1.5. relating to strengthening the resilience of populations
> Regularity of family agricultural income

2.3. relating to doubling of productivity and income of small-scale producers
> Economic performance and generation of family agricultural income

2.4. relating to sustainability of food production systems
> Regularity of agricultural income

Criteria	Economic performance from the farmer's point of view
Indicators Sub-indicators	Economic performance of cropping systems • Land use efficiency: Gross value added per hectare per year (GVA/year) : GVA = Gross Product - Intermediate Consumption • Gross daily labour productivity: Gross value added per working day (GVA/DD) Profitability of crop and livestock farming systems • Profitability of land use: Annual gross margin per hectare (MB/S/year): (MB = GAV - Cost of temporary paid labour) • Profitability of family labour use: Annual gross margin per family working day (MB/fam) Economic performance of the agricultural production system

	• Wealth creation: Net Value Added (NVA) • Annual labour productivity: Net value added per farm worker (NPV/UTA) • Daily labour productivity: Net value added per working day (NPV/Day) • Land use efficiency: Net value added per hectare (NPV/S/year) • Efficient use of capital: NPV/(intermediate consumption (IC) + economic depreciation (Am)) **Training and assessment of family farm income** • Breakdown of value added: Breakdown (in %) of net value added into: rent, interest on loans, taxes; remuneration of paid labour and family farm income • Composition of farm income: Components of farm income (in %): part of farm value added, subsidies, etc. • Remuneration for family work: Farm income per family worker (RA/UTF) • Profitability of land use: Farm income per unit area (RA/SAU) **Return on capital** • Profit rate: Farm income per unit of capital invested (RA/K) **Regular farm income** • Differences between income in an average year, a good year and a bad year • Risk of generating income below the survival threshold
Unit	According to indicators
Analysis level	For each farm in the sample identified by farm category
Frequency	For each year by cultural association Annual average of crop combinations Average over 5 years
Collection	**Surveys carried out by the** agricultural **adviser** Comparison with yields (section)
Sources	Farmers
Methodology	(Levard, 2019, p. 70-83).

➢ Appeal of agriculture for young people

If farms are to be better passed on from one generation to the next, young people will need to be more attracted to this type of crop and practice. The indicators proposed below can be used to monitor attractiveness and its progression in order to identify the risks of a decline in the associated agricultural activity and the risks of stopping growing crops.

2 LINK WITH THE SDGs

8 DECENT WORK AND ECONOMIC GROWTH

8.3. relating in particular to the development of productive activities and creation of decent employment

8.5. relating in particular to the achievement by 2030 of full productive employment and decent work for all men and women

Criteria	Making agriculture attractive to young people
Indicators Sub-indicators	Economic viability • Level of agricultural income in relation to the satisfaction of social needs and other income opportunities ((RA/UTF) in comparison with the country's minimum wage) • Prospects for growth and development (no prospects, limited prospects, strong prospects) Sustainability on the farm • Volume of hours devoted to the farm per family worker (average annual working time of family workers/legal working time in force) • Possibility of rest (number of days per week/month/year) • Quality of the atmosphere on the farm and in the community (questionnaire: very good - good - bad) • Estimated level of fulfilment (questionnaire: fulfilled yes/no) • Empowerment of young people vis-à-vis their elders (questionnaire/interview: level of responsibility in managing an activity, decision-making, access to income and autonomy in managing income) • Access to essential services and social life (water, energy, internet, health, education) Security • Estimating your own security with regard to the land Estimating one's own security of access to water in irrigated systems

Unit	According to the indicator
Analysis level	For each farm in the sample identified by farm category
Frequency	At t0, then every 5 years
Collection	Farm advisor survey
Sources	Farmers
Methodology	(Levard, 2019, p. 86-88).

- Value chains and trade organisations

2 LINK WITH THE SDGs

2.3. relating in particular to doubling agricultural productivity and incomes of small food producers

2.4. relating in particular to sustainability of food production systems

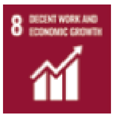
8.2. relating to achievement of a high level of economic productivity through diversification, technological modernisation and innovation

9.2 relating to the promotion of sustainable industrialisation that benefits all people and increase in the contribution of industry to employment and gross domestic product

Criteria	Arboriculture and commercial organisation
Indicators Sub-indicators	Opportunities for farmers • Number of outlets (direct sales on the farm, direct sales to customers, direct sales at markets, farm-gate sales, traders and wholesalers, processors) Sector development and operation • Number of supply chains (agricultural products and supplies) and development of new supply chains (new processing activities, new distribution channels, short supply chains, new consumer markets (local, regional, national, international)). • Players involved, technical operations, outlets, decision-making and regulatory mechanisms: identifying developments • The place and weight of farmers in decision-making mechanisms Wealth and job creation (optional) • Sales, added value in the sectors, employment and distribution of added value: overall sales, overall added value, employment and distribution of added value between players (farmers' income, remuneration of salaried employees, margins of other players) at the different stages of the sector.
Unit	According to the Indicator
Analysis level	For each farm in the sample identified by farm category
Frequency	Reference situation (t0) Then every 10 years
Collection	**Farm advisor survey** - interviews with farmers and other identified stakeholders
Sources	Farmers and other stakeholders
Methodology	(Levard, 2019, p. 90-95).

- Autonomy

2 LINK WITH THE SDGs



8.3. Relating in particular to the development of productive activities and creation of decent employment
Autonomy is a crucial to ensure a farm's sustainability and therefore retention of viable economic activity in a territory. Its degree of autonomy will determine whether or not the farmer can innovate, and adapt to changes in his/her natural, economic and social environment.

Autonomy helps to determine a farm's capacity to adapt and resilience. It therefore strengthens the long-term viability of the farm by assessing its ability to act and make decisions in the face of hazards.

Criteria	Autonomy
Indicators Sub-indicators	Autonomy in production decision-making • Estimated degree of autonomy (Very autonomous - Somewhat autonomous - Not very autonomous - Not autonomous); identification of choices • Intergenerational transmission of knowledge (safeguarding traditional knowledge) • Availability of decision-making tools (weather reports, technical monitoring tools, expense tracking, crop calendars, etc.) Autonomy in marketing decisions • Estimated degree of autonomy: (Very autonomous - Somewhat autonomous - Not very autonomous - Not autonomous); identification of choices • Availability of decision-making tools (price information, financial management tools, etc.) Decision-making autonomy for the transformation • Estimated degree of autonomy (Very autonomous - Somewhat autonomous - Not very autonomous - Not autonomous); identification of choices and constraints Decision-making autonomy for investment capacity • Estimated degree of autonomy: (Very autonomous - Somewhat autonomous - Not very autonomous - Not autonomous); identification of choices and constraints • Availability of decision-making tools

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	Economic and financial autonomy • RA per family asset/single reproduction threshold and minimum wage • RA/PB • Grant liabilities/RA **Technical autonomy** • Feed self-sufficiency (if applicable in the case of livestock farming) : Forage purchased/forage produced Seed autonomy: Seed produced / seed purchased Autonomous use of fertilisers : Purchased inputs/produced inputs
Unit	According to the Indicator
Analysis level	For each farm in the sample identified by farm category
Frequency	Reference situation (t0) Then every 10 years
Collection	**Farm advisor survey** - interviews with farmers and other identified stakeholders
Sources	Farmers and other stakeholders
Methodology	(Levard, 2019, p. 96-100).

➢ Empowering women

2 LINK WITH THE SDGs

1.1 relating to the reduction of extreme poverty

1.2 relating to reduction if the proportion of men, women and children of all ages living in poverty

1.4 relating to equal right for all to economic resources

1.5 relating to building the resilience of the poor and those in vulnerable situations

2.1 relating to access to safe, nutritious and sufficient food all year round.

2.3 relating to agricultural productivity and incomes of small-scale food producers

2.4 relating to sustainability of food production systems and implementation of resilient agricultural practices

2.5 relating to preservation of genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species

4.3 relating to equal access for all to technical, vocational and tertiary education

4.4 relating to increasing the number of young people and adults who have skills

5.1 relating to the end of all forms of discrimination against women and girls.

5.5 relating to ensuring women's full and effective participation and their equal access to leadership at all levels of decision-making in political, economic and public life

6.4 relating to the increase of water-use efficiency

8.5 relating to access for all to full productive employment and decent work and equal pay for work of equal value

This indicator is tracked using a survey format to be adapted according to the corresponding population.

Criteria	Empowering women
Indicators Sub-indicators	Technical" empowerment: access to and control over productive resources for women • Contributing to production decisions • Ownership of land and other assets • Access to and decisions on financial services

	Economic autonomy: management capacity and economic power • Access to own revenues and control over the use of revenues • Personal productivity **Social empowerment** Balance at work Group membership
Unit	According to the Indicator
Analysis level	For each farm in the sample identified by farm category
Frequency	Reference situation (t0) Then every 10 years
Collection	Farm advisor survey - interviews with farmers and other identified stakeholders
Sources	Farmers and other stakeholders
Methodology	(Levard, 2019, p. 101-104).

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➢ Employment and well-being

2 LINK WITH THE SDGs

8.3. . relating to achievement of full productive employment and ensuring decent work for all men and women, and equal salary for work of equal value

Criteria	Employment and well-being
Indicators Sub-indicators	**Job creation/maintenance** • Number of working days, employees and salaried employees per hectare (family and salaried employees): permanent employees (family and salaried employees) and temporary employees (specify frequency of employment). **Use of workforce over the year** • Analysis of work schedules: changes throughout the year, making the most of off-peak periods • Breakdown between men and women **Work remuneration** • Gross margin per family working day, AR per family worker • Daily or monthly remuneration for the workforce **Hard work** • Working hours/day and days off • Perception of the players (work is fulfilling, - work neither difficult nor fulfilling, - difficult work, - very difficult work; perception of men and women)
Unit	According to the Indicator
Analysis level	For each farm in the sample identified by farm category
Frequency	Reference situation (t0) Then every 5 years
Collection	**Farm advisor survey** - interviews with farmers and other identified stakeholders
Sources	Farmers and other stakeholders

Methodology	(Levard, 2019, p. 105-108).

- Food and nutritional security

2 LINK WITH THE SDGs

2.1. relating to the elimination of hunger and accessibility to healthy, nutritious and sufficient food all year round

Criteria	Food and nutritional security
Indicators Sub-indicators	**Food availability** • Quantity of food produced: Agricultural yields • Diversity of foods produced: Number of types of food produced and available to the family **Accessibility** • Family income: farm income / FTU, total income/asset, situation in relation to the simple reproduction threshold • Jobs: Number of jobs/ ha **Choice in the use of income** • Share of income managed by women; availability and relative price of products on the market **Food insecurity** • Food insecurity experience index (FAO - Food Insecurity Experience Scale (FIES))[47] **Use (food consumption and nutritional intake)** • Calorie and protein intake: Calorie and protein intake / consumption unit during typical calendar periods • Dietary diversity: Dietary diversity score over the year • Nutritional quality: Food consumption score over the year

[47] Guide to measuring dietary diversity at household and individual level, FAO. http://www.fao.org/3/a-i1983f.pdf

	Stability • Risks of food insecurity: Frequency of periods of food crisis • Calorie and protein intake: Calorie and protein intake/Unit during the lean season in the worst year in the last five years • Food diversity: Food consumption score during the lean season in a crisis year **Other factors influencing nutritional safety (optional)** • Household capacity to care for young children; healthcare use and expenditure
Unit	According to the Indicator
Analysis level	For each farm in the sample identified by farm category
Frequency	Reference situation (t0) Then every 2 years
Collection	**Farm advisor survey** - interviews with farmers and other identified stakeholders
Sources	Farmers and other stakeholders
Methodology	(Levard, 2019, p. 109-116).

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DOCUMENT HISTORY

Please consult this table to ensure that you are using the latest version of a given document. The document, as updated below, comes into force on the date of issue.

Document reference	SEC/METH/AGR-MF01_EN

Reference/Version	Date	Updates	Status
SEC/METH/AGR-MF01_EN_v1.0	2023_04_14	Initial Draft Version	Under internal review
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