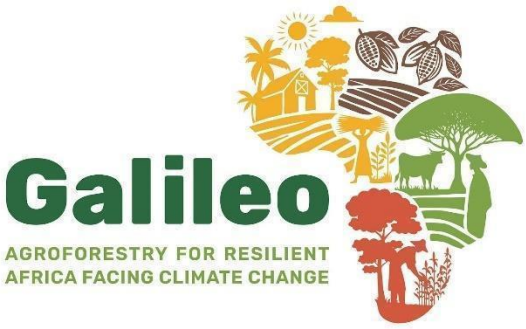

"StrengtheninG rurAL LIvelihoods and resiLiEnce to climate change in Africa: innovative agrOforestry integrating people, trees, crops and livestock (GALILEO)"

Date:	21st April 2025	***Version***	2
Deliverable	1.1 (Part 1)	***Lead :***	CIRAD
Due date	M8	***WP***	1
Deliverable name	Context analysis and co-creation methodology		
Description:	Part 1 of the D1.1. Guideline for applying methodology and tools for characterizing the context of the Living-labs		
Contributors:	Syndhia Mathé, Precillia Tata Ngomé, Gian Nicolay, Olivier Roupsard, Pierre Sutter, Chérif Syaka Assembène Mane, Anna Lou Abatayo, Antonio de Araujo Laplana		
How to quote this document			

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Abstract

The task 1.1. suggests activities of data collection and analysis that will support the other tasks of WP1 but also that will support other WPs particularly WP2 and WP5. That's why it is key that all partner contribute to that task as anticipate in the project proposal so that we get the full picture of each LL. Each partner can contribute in various ways considering the resources they have for that task. Three type of levels of contribution of the partners from low to high contributions can be mentioned : Brokers, implementers and compilers. In task 1.1, data will be collected on various dimensions for each LL including Monographical description of the area, Challenges and opportunities for the agroforestry system, Delimitation of the action/field sites, Existing endogenous innovations, Knowledge/ideas/institutions of farmers and researchers on how to leverage some challenges observe in the LL, Permanent actors in the area and functions, Project interventions in the last 5 years, Links among the identified actors, Interviews and Baseline survey and progress markers of the co-creation process. To collect such data various approaches will be mobilised such as desk review, key informant interview, LL inception workshop and baseline survey. All the data that will be compiled will contribute to produce that delivrable 1.1. and also set up the basis of the common knowledge within all LLs.

Acronyms

AFS	Agroforestry System
AIS	Agricultural Innovation Systems
IP	Innovation platform
ISS	Innovation support services
ISP	Innovation support service providers
LL	Living Lab
MAA	Multi-Actor Approach
MEL	Monitoring Evaluation and Learning
PM	Progress Markers

1. Introduction

1.1. ‘‘Farm2Policies’’: Socio-institutional innovations to stimulate agroforestry »

The overall objective of GALILEO is to rely on genuine Multi-Actor Approaches (MAA) to co-develop context-specific, people-centered agroforestry innovations in representative agro-pastoral, agroforestry, and agro-silvo-pastoral systems from Sub-Saharan Africa (SSA). The aim is to promote agroforestry as leverage to significantly improve agricultural, household, and climate change adaptation and mitigation performances and to enhance biodiversity in SSA. We build upon 8 agroforestry Living Labs (LLs: local scale and actors), 4 national and 1 regional Innovation Platforms (IPs), set up across 4 AU SSA countries. Through MMA, the project will co-construct potentially adoptable scenarios ex-ante with various actors including Innovator, Target, and Control farmers in our LLs. The later will then implement, assess, and compare performances in their pilot plots during the whole project. Using field observations to calibrate process models, the project will be able to simulate under future CC scenarios.

Thus, the project relies on transdisciplinary research, providing qualitative and quantitative data on the biophysical, socio-economic, and environmental performances. The mixed partnership between scientist coming from research organisations from the Global North and South create a nice opportunity to produce synergies between different expertises and approaches.

Galileo WP1 *« ‘Farm2Policies’: Socio-institutional innovations to stimulate agroforestry »* is designed as a WP1 as a support service for co-creation in the Galileo project. This co-creation process is at the center of the project. WP1 set the scene to support this process of co-creation by identify the key actors who will take part of the co-creation process, by collecting the key data to be shared among the various actors, by facilitating building of trust among the various actors by creating space for the co-creation process and setting a conducive or enabling institutional environment through the LL and innovation platforms.

The co-creation is at the center of the activities based on the multi-actors approach. The co-creation of ex-ante and ex-post scenarios is at the heart of the Galileo project. That’s why WP1 is organised in a way of putting the co-creation process at the middle and embedding this process through different activities (tasks) and products. The activities include the contextual analysis (ecological, historical, social, economical and institutional), the setting up of the multistakeholder partnerships, and the monitoring of the co-creation process to facilitate learning among the actors involved. The main products are the diagnosis, the established networks and the real time monitoring system.

Figure 1 provides a visual organisation of tasks of WP1.

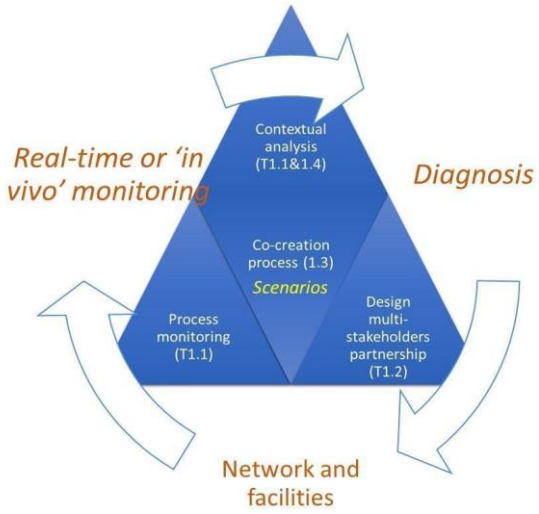


Figure 1. Organisation of WP1 as a support service for co-creation in Galileo project

This document contributes to the top of the triangle of Figure 1. This document is a part of the deliverable 1.1 as it is mainly a focus on the methodology to guide the country teams to collect and analyse the data that will contribute to develop the other parts of the deliverable 1.1, including the context characterisation or diagnosis and the methodology for co-creation. Deliverable 1.1 'Context analysis and co-creation' methodology is developed as part of the WP 1. It aims at describing the methodology that will be used to define the context in each living-labs in order to facilitate the setting-up of the eight living labs (T1.2) and facilitate the co-creation process of promising innovations for AFSP (T1.3).

The main objective of deliverable 1.1 is to :

- Define the context of each living lab so that all actors that will be included in the future process of co-creation start with the same understanding of the context
- Develop an understandable methodology (data collection and data analysis) that could be implemented in the 8 Living labs by the country teams
- Develop the methodology for the co creation process

1.2. Key reminders about engagement in the Galileo proposal

One of the main objective of Galileo is to engage multi-actors at different levels (local, national and regional) to co-create and implement sustainable agroforestry management solutions for AFSPs resilient : ''*We build on **participatory approaches and interdisciplinary research**, blending biophysical and socio-cultural research with local knowledge, covering all social dimensions of agroforestry (equity, justice, policy mechanisms, social networks), to **co-create people-centered, context-specific agroforestry management innovations** for increased long-term adoption*''.

The multi-actors approach (MAA) has been chosen to develop more **on-demand research**. The approach suggested is based on an Action-Research approach to support context-based innovations and produce more transformation and impact in agriculture and agrifood systems : ''*Dynamic multi-actor partnerships in the form of LLs and IPs are gaining increased recognition and*

implementation in Africa as effective means for steering research and experimentation in real life settings and as socio-cultural catalysts for transformations of local food systems''.

The on-demand research produced will nevertheless focus on certain entry points : « *Our key entry points will be improved crop productivity and fodder provision, improved soil properties and water functions, enhanced biodiversity, new value chains, income diversification through secondary products, increased access to market through certification, additional income through payment for ecosystem services and carbon farming, with a focus on extending productivity during the dry season and facing erratic climatic droughts* ».

Participatory research is the new paradigm for conducting research and Innovation projects as Galileo. It gives a central space for human relations and interactions. It implies a set of soft rules to condition a successful participatory process. For example, importance of time given to building trust among the actors or importance of processes and not to focus only on results. This condition applies even in the consortium partnership. For partners, who are not used to conducting participatory research some tips will be available in this document. Don't hesitate to contact the WP1 task leaders if you have any question about that topic or the content of the document.

Additionally, end of May 2025, three e-learning courses will be available on the CIRAD e-learning platform on ''*Mastering core capacities to manage R&I projects for sustainable impact in developing countries''* : https://elearning.cirad.fr/?lang=en. One of the e-learning courses will be entitled '' Innovating in partnership : Making collaboration work with open innovation approaches'' and will bring insights on the co-creation process. You will be informed when the course will be opened.

1.3. Some conceptual background

We need to share some definitions and concepts to be on the same page for that specific task as a project team. Other definitions are also available in the Excel sheet ("Definitions & Abbreviations ")

The interactive innovation model is based on a **multi-actor approach (MAA)** that involves all relevant actors with complementary backgrounds and expertise to co-create and share knowledge, best practices and innovative solutions responding to the needs of the users, farmers, foresters and advisors, in a bottom-up approach. The MAA in the Horizon Europe work programme is considered as a form of responsible R&I, aiming to make the R&I process and its outcomes more demand-driven, reliable and relevant to society. The most recent definition and requirements of the MAA are included in the introduction of the Horizon Europe Cluster 6 Work Programme 2023-2024 (pages 21-23).

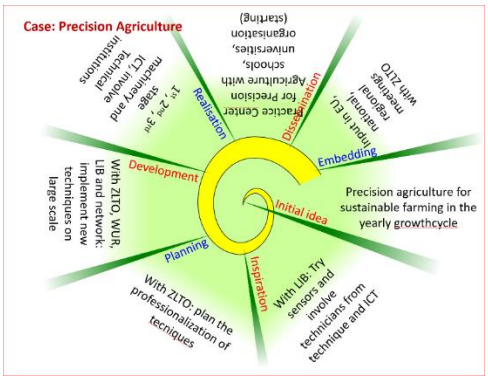
For Galileo project, the **Living Lab** is a local agora where the local actors meet to debate and make decisions around the questions of agriculture, forestry, livestock, etc. The Living Lab is a methodology and socio-ecological reality, in which citizens, residents and users (including external researchers) are seen as key players in the research and innovation process.

The project adopts the widely recognised **Agricultural Innovation Systems (AIS)** concept, seen *as « network of actors, organizations or individuals together with supporting institutions and policies in the agricultural and related sectors that bring existing or new products, processes, and forms of organization into social and economic use, including policies and institutions (formal and informal) which shape the way these actors interact, generate, share and use knowledge as well as jointly learn" (World Bank 2006, Klerkx et al. 2010)*.

Innovation is taken not only as a result of adoption of a new technic or technology but also and above all as **a process**. In Galileo project, we will give a wide attention to the **innovation process**. Several innovation process model exist in the literature. One of the most known is the « diffusion curve » of Roger, 2003. This curve has been which is widely used but has also shortcomings concerning its norming and linear character and implicit value judgements (Hoffmann, 2007). New models have been developed with more detailled in the innovation phases (Wielinga et al., 2016) and with more emphases on the feedbacks loops during the process. It exists several representations of the innovation process through the **spiral** or the **timeline tools**. Both help to understand the previous trend of the an innovation process and gives insights to better adapt the research intervention in order to not starting from scratch in a certain context. Context in which we are working are not a-historic, understand the innovation context in which we are working is a key step in an research and innovation project.

Figure 2. Examples of graphical representation of innovation processes : (a) Spiral of the innovation process of Precision agriculture in Netherland (Agripin Project) and (b) Innovative post-harvest storage of potato by a farmers' organization in Madagascar (SERVInnov project).

(a)



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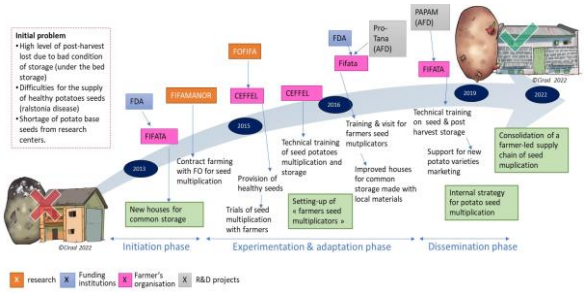
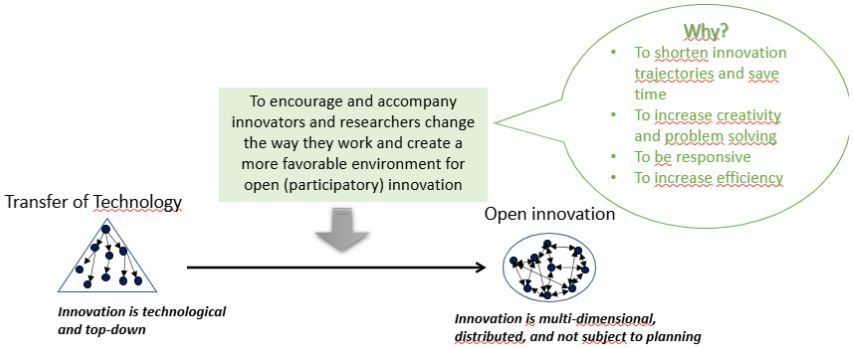


We can identifiy a diversity of innovations technical, technological, economic, social, organisational and institutionnal. In Galileo we are interesteted in that different type of innovation because one type of innovation can't appear without other type of change. Leeuwis and Aarts (2011) define that succesful technical innovations come with three innovative dimension : '**Hardware'** (i.e. new technical devices and practices), **'software'** (i.e. new knowledge and modes of thinking) and **'orgware'** (i.e. new social institutions and forms of organisation). Co-creation help to integrate that different dimensions in the scenarios.

Endogenous innovation process can occur thanks to individual or group of **positive deviants : «** *Positive deviants challenge existing organisational structures and institutional set-ups, and promote alternative approaches to solving seemingly intractable social problems, either playing direct role of a boundary spanner or indirect role as activists »* (Pant and Hambly Odame 2009). The innovation tracking will help to identify the possitive deviant and the endogeneous innovation that they are developing. What is interesting inthat innovation tracking is also to be sensitized to the **capacity to innovate** (Allebone-Webb et al. 2016) of the positive deviant more than on the innovation per see.

By mobilising Multi-actor and innovation process approaches in Galileo project, it engages researchers in changing their paradigm of work adding to main dimensions. Firstly, research should move from a technology transfer appraoch to a more open innovation approach.

Figure 3. From technology tranfer to Open innovation trough a wider participatory approaches

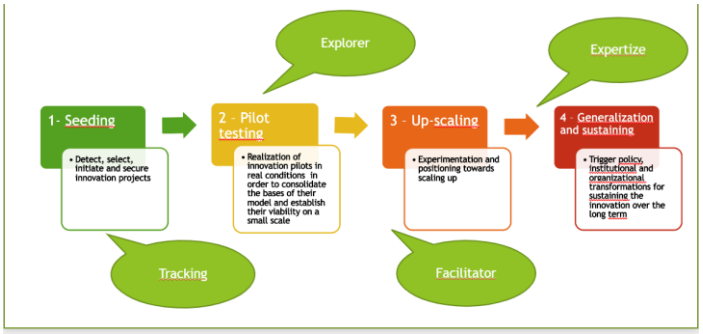


Role of science	Innovators	Experts	Collaborators	Partners, among others, who respond to requests
Role of agricultural actors	Adopters	Information sources	Experimenters	Partners, Innovators, Entrepreneurs, who formulate requests

Source : DeSIRA LIFT_Inception Worshop

Secondly, beyond the production of knowledge research can play a diversity of roles within this innovation process (Toillier et al. 2018).

Figure 4. Possible researcher's role in support of an innovation trajectory



Source : DeSIRA LIFT_Inception Worshop

Participatory approaches require to pay more attention to the **power relations** between the stakeholders. In fact, the innovation process doesn't take place in an vacuum or asceptic environment. It is embedded in the social environment of the stakeholders which means that the stakeholders come with their different hats, but also with their usual social relationship. For example, if a chief is part of the process we will have to facilitate the discussion by setting specific rules in the group so that the others can contribute without thinking they are disrespecting the chief. That's why research can endorse the **role of facilitator** or identify a facilitator to support the whole process. Facilitation includes various activities that ease collaborations in co-creation processes such as knowledge sharing, creating connections, managing resources (including time), motivating stakeholders, managing tensions and conflicts. An **innovation facilitator can also act as a broker** (Klerkx et al. 2009, Klerkx and Gildemacher 2012) which means he will hels to translate various stakeholders languages into understandable language. For example he can explain knowledge bring by researcher about water dynamic and recharge of the aquifer in a way it make sense to farmers.

Facilitation is part of Innovation support services (ISS). ISS include all activities that are considered supportive to innovation generation and development, by innovators (clients) and/or third parties. They can be observed and identified as a communicative, mutual relationship between the ISP and the

supported clients (individuals, groups, networks) and they may have a broad range of effects (e.g. providing information, supporting planning, linking people etc.). Innovation support services include seven category of activities (Faure et al. 2019, Audouin et al. 2021, Ndah et al. 2021, Mathe et al. 2023) : 1) Knowledge awareness and exchange, 2) Advisory, consultancy and backstopping, 3) Demand articulation, 4) Networking, facilitation and brokerage, 5) Capacity building, 6) Enhancing access to resources and 7) Institutional support for niche innovation, and scaling mechanisms.

These ISS are given by **innovation support service providers (ISP). ISP** are all actors who provide one or several innovation support services. ISP can be both, individual actors and organised bodies. Also, ISP might have a formal character (e.g. an NGO, an advisory organisation etc.) or be of informal kind (e.g. a family member, a random visitor etc.). We identify five categories of ISP : 1) Public organisations, 2) Private organisation, 3) Farmer-based organisations, 4) Civil-society based organisations, and 5) Informal service providers including « tontine », customary authority (village), religious authorities,…. These services providers intervene along the innovation process to support and boost it.

« Alone we go faster, together we go further »

The involvment of all that actors in the innovation process even it improve the probability of buy-in and uptake, increase the **duration of the innovation process**. A clear balance should be find between « quality » of the innovation process and the speed of first results. In the duration of innovation process, we should not neglect type to built trust and time to deconstruct what the farmers think we expect from them (the legacy of the popularization/awareness-raising messages that may have been sent out in the area, not always in line with reality). This data collection and analysis period will be among the first interactions (in some cases) with the actors of the Living-labs (LLs). It is important to take time to interact with these actors including the local authority and other organisations which have conducted activities in this area and.

These first interaction with the actors of the LL set the basis for the co-creation process in T1.3. **Co-creation** is a collaborative process where multiple parties, often including businesses and customers, actively participate in the creation of value. It's a form of open innovation (where external stakeholders are brought into the innovation process. This can involve the development of new products, services, or even business models. Co-creation differs from traditional models where innovation happens solely within an organisation. In co-creation, participants interact, share ideas and contribute with their expertise (scientific or not), leveraging diverse perspectives to achieve a shared goal. van Ewijk and Ros-Tonen (2021) demostrate '*that knowledge co-creation play a central role in reducing the time lag between research findings and their translation into practical outcomes*'.

2. Methodology

2.1. Information to be collected

Task 1.1 aims at providing an overview of the context in the Living-labs (LLs). The objective is not to develop an in-depth contextual characterisation and description. The amount of information available in the LL won't be homogeneous. It depends on the level of Research and Development interventions, the degree of isolation of the area and the existence of statistical secondary data from public services.

Different types of data will be collected :

1. The **Contextual data** refers to data that will help to established the situational analysis. It includes (non in-depth) monographical data, the challenge and the opportunities in the area and the delimitation of the geographical area of intervention and action.
2. The **potential for innovation** include the data on the new ideas to overcome existing or forthcoming challenges from the communities and from the researchers perspectives. This list doesn't mean that we will work on all the existing ideas or one idea in particular. The co-creation process can bring some hybrid ideas.
3. The **mapping of actors** in the LL will give an overview of all the actors in the area and an idea on with whom we should be partnering. The list of actors includes hybrid organisations as on going and previous projects.
4. The **baseline individual data** is meant to collect the data to assess the result of the project
5. The **process indicators** are indicators that will be co-constructed among the actors of the LL to follow the process of co-creation. Indicators will be defined as progress markers that actors 'expect to see', 'like to see' or 'love to see'.

The table below summarises the type of data to be collected at the level of the LLs to have a clear understanding and characterisation of the area.

Table 1. Diversity of data to be collected in the LLs

Type of data	Dimension	Detail description
Contextual data	Monographical description of the area	1. Ecological data (Meteorological and Climatic data and past shocks and events for the last 10 years, soil type, vegetation type, Biodiversity hotspots and conservation activities) 2. Agricultural system (Project in the last 5 to 10 years, Agricultural dynamics, Typology of agroforestry system, prefered trees, Farming system, cropping system, animal) 3. Socio-economic data (Population density, poverty level, market access, main source of income/ opportunity cost of non-agricultural activities, firms, villages..) 4. Historical data (important past events in the LL, highlights) 5. Institutional data (Farmer organisation, Infrastructure, important regulations that can affect our work)
	Challenges and opportunities for the agroforestry system	Identification of the main challenges related to climate variability on crops, animals, trees and humans and current or coming opportunities
	Delimitation of the action/field sites	Identification of actions sites (replication area) and the field sites (activities will take place) (incl. GPS coordinates)
	Existing endogenous innovations	1. List of endogeneous innovations 2. Strengths of the innovation

Potential for innovation		to overcome challenges in the LL including the dry season and climatic variability effets on crops, animals, trees and humans 3. Description of the innovation, geolocalisation and identification of farmers
	Knowledge/ideas/institutions of farmers on how to leverage some challenges observe in the LL	List of issues which farmers would love to discuss with the researchers
	Knowledge/ideas/intuitions of researchers on how to leverage some challenges observe in the LL	1. List of knowledge/ideas/ intuitions that researchers want to include in the discussion during the co-creation process
Mapping of actors	Permanent actors in the area and functions[1]	1. Identification per type of actors (farmer organisation, public actors, extension agents, local authorities, supply providers, ..) 2. Identify main functions of actors (access to ressources, Knowledge sharing, marketing, technical support, Institutional support) *Starting check out for innovator actors, target actors and Relay actors (WP2)*
	Project interventions in the last 5 years	1. Identify previous projects in the LL 2. Identify the legacy of the projects on which we can build on in Galileo
	Links among the identified actors	1. Map the actors and their interactions
Baseline individual data	Interviews and Baseline survey	1. Minumum of 25 interviews (after observing the LL and preselecting candidates of interviews) 2. A survey created via Qualtrics that will take approximately 1-2 hours for interviewees to go through
Process indicators	Progress markers	1. Co-produce a set of indicators to monitor the co-creation process 2. Develop a guide to monitor the indicator

The different type of data will come from different primary and secondary (see Table 2 below for extensive definition). (,. In Galileo, we consider primary data as data that are collected directly by the project memebers through surveys, interviews, experiments, specially designed for understanding and solving the research problem at hand. Secondary are data generated by other actors out of the Galileo project. It includes reports, databases, …..

2.2. Data collection and st orage

2.2.1. Main steps of the methodology

[1] In the case of Cameroon we talk of the actors in the cocoa value chain but also actors that work on agroforestry system, biodiversity conservation (agroecosystem services, climate change)

The methodology is based on a 1+ 6 steps with an several alternances between 1) data collection and data analysis, 2) desk review and field work, and 3) collection of primary and secondary data.

1. Step 0. Who is doing what for T1.1. It is important to have a clear vision per LL on who is doing what.
2. Step 1. Desk review. It mobilises secondary data. The source of data can come from previous project reports or deliverables, local and national statistical reports, and recent surveys in the areas.
3. Step 2 . Key informant interviews. This is primary data collection. The key informant uses the expertise of the area and their knowledge to complete the information gathered from the desk review. Key informants can also provide additional documentation[2].
4. Step 3. First stage of data analysis. This step aims at starting compilation and organisation of the data collected. Firstly to feed the discussion for the LL inception workshop and help designing the baseline survey questionnaire. Secondly to contribute to the writing of the deliverable 1.1. An outline will be provided to write the report.
5. Step 4. Baseline survey and LL inception Workshop. This step is mostly based on primary data collection. It includes an in-depth field work for data collection through the baseline survey in collaboration with WP5 (and task 6.3) and the LL inception workshop
6. Step 5. Second stage of data analysis. This step is mainly based on the analysis of the data collected in step 4.
7. Step 6. Final report on each living Labs. The last step is the writing of the final report of the contextual analysis on each living lab. An outline will be provided.

Online internal data collection will be launched to collect during step one and will last along the project to identify data held by Galileo partners on the living labs and knowledge/ideas/intuitions of researchers on how to leverage some challenges observe in the LL.

The figure below summarises the 6 key methodological steps for T1.1.

Figure 2. A six-steps methodological approach

2.2.2. Data collection approaches and tools

Two types of data will be collected, primary and secondary data, and will mobilise different data collection approaches. The data to be collected in table 2 will come from various sources. It will allow for triangulation[3] of data coming from different sources.

Table 2. Mobilised data collection approaches

[2] In the case of Cameroon, primary data would collect in the twos LL (Loum-Tombel and Ntui-Bokito). The number of actors (sample) chosen will depend on some factors: representation, accessibility of actors, financial means, time, etc. Before the questionnaire is drawn, consider the context of the study (type of data needed).
[3] Data triangulation is the use of a variety of data sources, including time, space and persons, in a study. Findings can be corroborated and any weaknesses in the data can be compensated for by the strengths of other data, thereby increasing the validity and reli- ability of the results.

Type of data	Data collection approaches	Data to be collected
Secondary	Desk review using, Project reports, Local and national statistics, Previous surveys	Contextual data Existing endogenous innovations Permanent actors in the area and functions Project interventions in the last 5 years Links among the identified actors
Primary	Key informant interviews	Contextual data Mapping of actors Existing endogenous innovations[4]
	Galileo online internal data collection	Knowledge/ideas/intuitions of researchers on how to leverage some challenges observe in the LL
	Baseline survey	Individual data on on-farm and off-farm income, productivity, resilience, capital investments, etc
	Inception workshop	Validation of contextual data, key actors and existing innovations Prioritization of Challenges and opportunities Delimitation of LL action / field site (using map) Progress markers

The following section will describe in more details the activities to be implemented in T.1.1. In order to simplify the implementation we develop ''Methodological sheets" as annex of that document. This methodological sheets are developed to provide details on how the various methods and tools should be implemented. The methodological sheets give details on how to collect the data, how to store it and how to analyse it.

2.2.3. Secondary data : the Desk review

The desk review should start right after the Kick-off meeting. It starts by the tracking of documents, survey that will help to characterise the context of the LL[5], identify existing endogenous innovations and map the main actors in the area. As mentionned prior, the level of information may not be homogeneous for the various LL. For the missing data, two options can be used : first identify key informants to complete the missing data or second if the data doesn't exist, make an expert assement with the actors during the inception workshop.

To know more about the desk review methodology, please go to methodological sheet 1, 2 and 3.

[4] To identify innovative practices, you first need to know the practices in the agrarian system, and these practices sometimes differ depending on the type of producer. This will prevent a practice from being classified as innovative if it is common for a well-defined type of producer (e.g. those who are from the village and reinvest, sometimes at a loss, in the village).

[5] 1. Ecological data (Climate, soil type, vegetation type), 2. Agricultural system (Project in the last 5 to 10 years, Agricultural dynamics, Typology of agroforestry system, prefered trees, Farming system,), 3. Socio-economic data (Population density, poverty level, market access, main source of income, ..), 4. Historical data (important past events in the LL, highlights) and 5. Institutional data (Farmer organisation, Infrastructure, important regulations that can affect our work)

2.2.4. Primary data

In addition to the secondary data, primary data will be collected to identify the current potential farmers to work with and the relevant networks, value chains and institutions to consider (complete the secondary data and be used as a source for discussions during the co-creation process). The primary data collections include three approaches : the key informant interviews, the Baseline survey and the LL inception workshop. Additional primary data will be conducted within Galileo project to gather documents from the partners and ideas/intuitions on how to overcome challenges identified in the LL.

As we are collecting data and personal information, we should use the consent form in all primary data approaches, consistently with Ethics WP9. A full consent form needs to be filled in by every participant in workshops/focus groups etc. The consent form are available on the google drive (Drive\GALILEO for Partners\WPs\WP9 – ETHICS)

a. Key informant interview

The key informant interviews will help to complete the missing information from the desk review. The sample will be based on the diversity of actors who can provide specific information about the LL area. The table below suggest a distribution of the interviews for each LL. The distribution can be adapted according to the structure of actors in the LL. f

Table 3. Distribution of key informant per LL

Type of key informant	**Number of interviews**
Farmers organisation representatives	2
Farmer leaders	2-5
Innovator farmers	7-10
Local authority	1
Administrative authorities	2
Organisations which conducted R&D activities in the area (2020-2025) - Research organisation - NGO	 2 2
Other key informant (context-based)	2
Total	20-25

The methodological sheet 4 provides the interview guide for the key informant. It could be adapted based on the context.

NB : An excel file will be prepared to entry and store the data (available on Google form)

b. Baseline survey approach

One of the key objectives of the GALILEO project is to evaluate the effects on sustainable income generation and diversification in diverse contexts across Sub-Saharan Africa (SSA). To accurately and causally assess the impact of AFSPs on sustainable income and livelihood diversification, it is essential to collect baseline (pre-intervention) data covering a range of socio-demographic, economic, health, and preference indicators.

To this end, WP5, in collaboration with WP1, will design an online survey via Qualtrics. Enumerators will implement the survey in the field using tablets. The survey will be loaded onto the tablet beforehand, allowing enumerators to collect responses offline when needed, with data automatically uploaded once an internet connection is available. Enumerators will visit farmers individually at their homes or places of work. Each enumerator will work directly with a single participant at a time to ensure that the survey is completed accurately and that any challenges are addressed in real time. This more personalized approach is particularly important in contexts where digital literacy or connectivity may be limited. Their presence ensures that participants can receive immediate assistance in case they encounter any difficulties, have questions about specific items, or require clarification on how to navigate the survey platform. All enumerators will be previously trained by WP5 on how to perform their tasks. We estimate that enumerators can survey no more than five individuals in a single day, given the length of the survey and transit time.

At the initial stage, access to the survey and hence, the survey data collected through Qualtrics will be restricted to Work Packages 1 (WP1) and 5 (WP5) - including the PhDs in each country - to ensure data integrity and oversight during the data collection process. While the survey is ongoing, nobody - including WP1 or WP5 members - will have editing access. Any mistakes made during data entry should be documented in a separate Word file and corrected during the data cleaning phase. Once data collection for the baseline survey is fully completed, WP5 will be responsible for exporting the survey responses as CSV files. These files will then be securely stored in a designated GALILEO project repository.

In addition to the raw data, the repository will include a comprehensive data dictionary, which provides detailed descriptions of each variable, coding schemes, and response categories used in the survey. WP5 will also include all scripts or code used for data cleaning and preprocessing (e.g., handling missing data, recoding variables, consistency checks), ensuring transparency, reproducibility, and ease of use for subsequent analysis by other work packages. The cleaned and documented dataset will be made available to other relevant stakeholders and project teams within GALILEO.

The survey will not collect any personally identifying information (PII).To ensure proper tracking and anonymization, each participant will instead be assigned a unique and randomly generated participant code that remains consistent across both the baseline and post-intervention survey rounds. This code will serve as the only link between the two datasets, allowing us to accurately track changes in participants' socio-economic characteristics over time, and will be stored in a secure, encrypted key file maintained by the local implementation team and accessible only to authorized personnel within WP1 and WP5. The key file will contain non-identifiable anchor traits (such as village and year of birth) to assist in participant re-identification at endline. No personal identifiers (e.g., names, phone numbers) will be stored. This approach maximizes participant confidentiality while ensuring data consistency across survey waves. Maintaining a consistent identifier is essential for conducting longitudinal analyses and assessing the impact of interventions on individual outcomes. Without such a system, it would be impossible to match baseline responses with post-intervention data, thereby compromising our ability to evaluate progress, measure impact, or draw causal inferences. Enumerators must ensure that each participant receives and retains their assigned code, either by recording it on a physical card or providing it digitally (e.g., via SMS or email, where feasible). Clear instructions should be given to participants on the importance of keeping this code safe and accessible for future survey rounds. This way, we avoid consulting the key file unnecessarily, holding its use to cases in which participants do not remember their codes.

The survey instrument must also clearly identify and differentiate among respondent groups, such as farmers, pastoralists, or mixed livelihood households. The composition of these groups may vary depending on the time of year and location. This classification is crucial, as each group may receive tailored question modules relevant to their context, such as livestock management for pastoralists or crop diversification for farmers.

Moreover, to ensure relevance and contextual accuracy, WP5 will collect and integrate detailed information about the specific innovations being introduced in each site. This knowledge is essential to adapt the survey questions accordingly and to assess adoption, perceptions, and impacts of these innovations in a consistent but context-sensitive manner.

It is also important that local teams review the first version of the survey. Their feedback will help ensure that the wording, content, and structure of the questions reflect local realities, including specific crops, farming systems, or livelihood strategies relevant to each country or region. Local input will help increase the validity and acceptance of the survey tool in the field.

While it is not necessary for the WP5 trainers to speak the local languages, all enumerators must be fluent in the local languages spoken by the participants in their area. This ensures that they can clearly explain questions, assist with interpretation, and foster participant comfort and trust during the survey process.

The sampling strategy for the baseline survey must be carefully designed to ensure that there is a sufficient number of each key participant type—namely, innovator participants, control participants, and treated participants—distributed across all targeted counties. It is essential that each of these groups is adequately represented not only in the baseline survey but also in the follow-up (post-intervention) survey. This balanced representation is critical for enabling meaningful comparisons and drawing robust conclusions about the impact of interventions over time.

To determine the precise number of participants required in each category, WP5 will conduct a power analysis. This statistical procedure will estimate the minimum sample size needed to detect significant differences between groups with an acceptable level of confidence and statistical power (typically 80% or higher). The power analysis will take into account expected effect sizes, variance in key outcome variables, and potential attrition between the baseline and post-intervention phases. By ensuring an appropriately powered sample across participant types and geographic areas, the study will be better positioned to identify causal effects and avoid the risk of underpowered or inconclusive results. Furthermore, this sampling approach will support disaggregated analyses, such as by gender, age, or region,if relevant, thereby enriching the insights derived from the data.

c. Galileo online internal data collection

- *In-country responsibility sharing for data collection*

It is important to start by a country meeting to distribute the responsibilities among the country team **per LL** concerning the data collection, data analysis and writing of the report in T1.1. A list of 22 activities have been identified in T1.1 (Table 4).

Table 5. Detailed activities in T1.1.

N#	**Detailed activities in T1.1**
1	Organisation of country meeting
2	Lead the online data collection among the Galileo partners (step 0)
3	Provide information for desk review

4	Compile information of the desk review
5	Analyse data of the desk review
6	Write the report from the desk review
7	Organise the key informant interviews
8	Conduct and store the key informant interviews
9	Analyse the results of key informants
10	Write the report from the key informants interviews
11	Compile the reports (desk review and key informants) to write the first LL report (contribution to D1.1)
12	Organise/preparation of the baseline survey
13	Conduct and store the interviews
14	Analyse of the results of the baseline survey
15	Write the report on the baseline
16	Organise the LL inception workshop
17	Facilitate the LL inception workshop
18	Reporting (including pictures) on the LL inception workshop
19	Analysis of the data collected in the LL inception workshop and write report
20	Writing the final report on the LL (compile baseline + Inception workshop)
21	Provide methodological support
22	Editing of reports

A table could be developed based on the activities to be conducted to facilitate the discussion (Table 5) or you can use directly the Excel file available. Please use it to gather the information on sheet ''T1.1_Who is doing what'' : Link to the Excel file

Table 5. Distribution of responsibilities per LL

Type of approach	Lead partners/ Human resources	Other partners involved and contributions
Desk review using, Project reports, Local and national statistics, Previous surveys		
Key informant interviews		
Galileo online internal data collection		
Baseline survey		
Inception workshop		

We strongly suggest that two main functions should be distributed at the country level (not at the LL leveal) and communicate to the task ledear of 1.1 (syndhia.mathe@cirad.fr)

- **Data coordinator for the LL diagnosis** (March to July). This person should ensure that the information is provided in an acceptable form and stored at the right place, guarantee that the important information is collected, and then compile an overview that can be used for the June-early 2-2 workshop with the LL stakeholders.

- **Editor for the LL report July 2025**. Not to put all the burden on one shoulder, the other persons shall be responsible that the LL report is delivered timely and in acceptable quality.

- *Available documents on the LL*

NB : All partners are involved in that particular activity ! See Box

A clear list of documentation could be shared so that we develop internally a database on the document already available[6]. An excel document is available use it to gather the information on sheet ''T1.1_Available Docs'' : Link to the Excel file

If the document is available online we can put the link or store it in the Galileo Google drive : Here.

[6] Drive\GALILEO for Partners\WPs\WP1\Task 1.1_Context definition and context-based methodology development\Documentation for desk review

Box 1. Level of contribution of partners in task 1.1

The task 1.1. suggests activities of data collection and analysis that will support the other tasks of WP1 but also that will support other WPs particularly WP2 and WP5. That's why it is key that **all partners should contribute to that task as anticipate in the project proposal** so that we get the full picture of each LL. Each partner can contribute in various ways considering the resources they have for that task. Three levels of contributions of the partners can be condidered.

The table below helps to identify were you fit !

Contributions of partner regarding their resources for task 1.1	**Provide documents and information for desk review + storage of document in Galileo document databases + provide contact of key informant + facilitate contact with onfield partners to contribute to support LL inception workshop, cocreation activities and baseline survey**	**Organise data collection + collect data + data storage**	**Data analysis + writing of reports**
Brokers *(Minimum level contribution-partner)*			
Implementers *(Medium level contribution-partner)*			
Compilers *(High level contribution-partner)*			

- *Knowledge/ideas/intuitions of Galileo partners on how to leverage some challenges observe in the LL*

It is important to have a clear idea of what Galileo can suggest to the other LL actors. We propose to build a list of Knowledge/ideas/intuitions of Galileo partners on how to leverage some challenges observe in the LL.

An excel document is available please use it to gather the information on sheet ''T1.1_Intuitions of partners'' : Link to the Excel file

3. Methodology : Data analysis

3.1. First round of analysis

The data analysis of the first round will be performed on the desk review and the key informant interview. . Most of the data are qualitative and require qualitative analysis. Some data that have been collected through various data collection approach will be analysed on their own : data on exiting

innovation, on major events, actors and projects. This data should be stored here. The excel file could be used to produce graphics or some statistics.

The data will be analysed through the frame of the type of data. The analysis will capture data that are triangulated through various sources of information : desk review and key informants interviews. The analysis should consider most significant information regarding the areas of the contextual analysis. It is possible to start with a table as below.

Excel,SPSS or other statistical software can be used to analyse data collection. For the key informant interview, we use only basic statistical analysis as the sample is low. Another option is the document analysis (Cf Box 2).

Box 2. Content analysis

Document analysis involves skimming (superficial examination), reading (thorough examination), and interpretation. This iterative process combines elements of content analysis and thematic analysis. Content analysis is the process of organising information into categories related to the central questions of the research. Some qualitative research experts may object to content analysis, contending as Silverman (2000) did, that it obscures the interpretive processes that turn talk into text. Those research experts should bear in mind that documents include more than transcriptions of interviews and other forms of talk. Further, the kind of content analysis that I recommend excludes the quantification typical of conventional mass media content analysis (although quantitative content analysis can be useful in providing a crude overall picture of the material being reviewed, with indications of the frequency of terms). Rather, it entails a first-pass document review, in which meaningful and relevant passages of text or other data are identified. The researcher should demonstrate the capacity to identify pertinent information and to separate it from that which is not pertinent (Corbin & Strauss, 2008; Strauss & Corbin, 1998)

(PDF) Document Analysis as a Qualitative Research Method. Available from: https://www.researchgate.net/publication/240807798_Document_Analysis_as_a_Qualitative_Research_Method [accessed Mar 19 2025].

AI tools can also be use to analyse the documents. Cirad has an AI tool that can be used to facilitate the analysis of the data : https://keops.cirad.fr/. But other AI tool can be used as Claude AI for example. The use of AI should refer to WP9.

The options for the data analysis should be chosen according to the availble skills in each country and LL to conduct such work. The main output of this work should be getting information to be able to feed the report on the different area of contextual analysis (Table 6).

For ecological and geographic data maps (when it is possible) are expected to describe soil type , climate variation, biodiversity evolution, …..). Table 6 shows the types of format that can be used as a result of the analyisis.

Table 6. Organisation of the data analysis

Areas of contextual data	Instrument of analysis
1. Ecological data (Meteorological and Climatic data and past shocks and events for the last 10 years, soil type, vegetation type, Biodiversity hotspots and conservation activities)	Maps Graphics Diagrams Text
2. Agricultural system (Project in the last 5 to 10 years, Agricultural dynamics, Typology of agroforestry system, prefered trees, Farming system,)	Text Graphics
3. Socio-economic data (Population density, poverty level, market access, main source of income, ..)	Text Graphics (bar plot, Trend, …) Tables
4. Historical data (important past events in the LL, highlights)	Text Timeline
5. Institutional data (Farmer organisation, Infrastructure, important regulations that can affect our work)	Text
6. Challenges and opportunities	Text
7. Existing endogenous innovations (type of innovations,	Text Tables
6. Mapping of actors (Diversity of actors, Functions of actors,	Text Map Tables
8. Project intervention in the last 5 years (type of intervention)	Text Tables Timelines

This first round of analysis has two purposes. The first one is to complete the delivrable 1.1. The Methodological sheet 10 provides the outline for the first report to be shared no later than end of J uly 2025 with the task leader and WP1.1 leaders. The second purpose is meant to prepare the next phase of data collection : prepare the adapted tool for the baseline survey and prepare the LL inception workshops.

During the Inception, the main results from the desk review and the key informant interview will be presented. The participants will give feedback and additional information and validate the content of diagnosis as a starting point to work together.

3.2. Second round of data analysis (part of step 4)

3.2.1. Baseline survey analysis

As previously mentioned, access to the survey platform and the resulting data will initially be restricted to members of Work Packages 1 (WP1) and 5 (WP5), PhDs and country leaders. This

controlled access is intended to ensure data quality and confidentiality during the collection phase. Once the baseline data collection is completed, WP5 will be responsible for exporting the raw survey responses from Qualtrics in CSV format. These files will be securely stored in a designated GALILEO project repository that will serve as the central hub for data management and sharing.

Following the export, WP5 will undertake a thorough data cleaning process, which may include the handling of missing or inconsistent values, variable recoding, and standardization of data formats. This process ensures that the dataset is reliable and ready for analysis. Additionally, **in partnership with the PhD students and interested partners**, WP5 will perform preliminary statistical tests as needed to verify the internal consistency of the data and prepare it for integration with relevant external or secondary datasets. This may include household or regional-level data sourced from national surveys, government databases, or other public sources.

All data processing, including cleaning, statistical testing, and dataset merging, will be conducted using statistical software such as Stata, R, and/or Python—depending on the nature of the task and the expertise of the analysts involved. To promote transparency, reproducibility, and collaboration across the GALILEO consortium, all scripts and code used in these processes will be documented and shared alongside the data within the same repository. This ensures that future users—whether within the project or external collaborators—can understand and replicate the data preparation steps, and build upon the analysis as needed.

3.2.2. LL inception workshop analysis

The data collected in the inception workshop will fit with the various data storage and analysis tools of the first round of data collection and analysis.

Table 7. Instrument for analysis of data collected during the LL inception workshop

Data collected	**Instrument of analysis**
Data completion/Validation of diagnosis : - Key actors - Project - Existing innovation	Complete the data on the first report
Prioritazitation of Challenges and opportunities (group work) Problem tree with the most significant problem (related to agroforestry) *(Methodological sheet 8 : Problem tree tool)* Restitution	Diagrams Text
Who to partner with in the LL to find solutions ? Exercise of delimitation of the LL action/field site (using a map) ***It is an optional exercise, it can be used for T1.2 (so the last session of day 3 can come afternoon of day 2)***	Diagrams Map Text
What do we want to acheive together Co-contruction of indicators (progress makers) Modalities of monitoring of the indicators *(See Methodological sheet 9 : Co-construction of progress makers (process indicators)*	Tables Text Graphics

4. Planning of activities

Two types of activities are identified. The activities to be implemented in the LL (following the steps in figure 2) and the activities conducted by the task leader to support the activities on the ground. The task leader produces the methodological guide for 1.1., will organise a meeting to collect questions and feedback about the activities to be implemented and provide support to the team on the ground.

Tableau 7. Planning of activities in T1.1.

			Feb. 25	March 25		April 25		May 25		June 25		July 25		August 25		sept.-25		oct. 26		nov. 25		Dec 25		janv.-26		Feb 26	
		List of activites in T1.1 at LL level	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half	1st Half	2nd half
Step 0. Distribution of roles per LL	1	Organisation of country meeting																									
	2	Lead the online data collection among the Galileo partner (step 0)																									
Step 1. Desk review	3	Provide information for desk review																									
	4	Compile information of the desk review																									
	5	Analyse data of the desk review																									
	6	Write the report from the desk review																									
Step 2 . Key informant interviews	7	Organise the key infomant interviews																									
	8	Conduct and store the key informant interviews																									
	9	Analyse the results of key informant																									
	10	Write the report from the key informant interviews																									
Step 3. First stage of data analysis	11	Compile the reports (desk review and key informant) to write the first LL report (contribution to D1.1)																									
Step 4. baseline survey/LL inception Workshop	12	Organise/preparation of the baseline survey																									
	13	Conduct and store the interviews																									
	14	Analyse of the results of the baseline survey																									
	15	Write the report on the baseline																									
	16	Organise the LL inception workshop																									
	17	Facilitate the LL inception workshop																									
	18	Reporting (including pictures) on the LL inception workshop																									
Step 5. Second stage of data analysis	19	Analysis of the data collected in the LL inception workshop and write report																									
Step 6. Final report on each living Labs	20	Writing the final report on the LL (compile baseline + Inception workshop)																									
		Activity of coordination of T1.1.																									
		Availability of the draft version of the methodology for T1.1																									
		Meeting to discuss the methodology																									
		Receive feedback from the country team on the methodological document																									
		Final version of the methodological document																									
		Provide methodological support																									
		Editing of reports																									

5. Conclusion

The task 1.1. suggests activities of data collection and analysis that will support the other tasks of WP1 but also that will support other WPs particularly WP2 and WP5. All partners contribute to that task with different level of contribution as brokers, implementers and/or compilers. The activities and appraoches are described in this document. Each country team should organise and clarify contributions of each partner for each LL before starting the activities so that we get a clear picture on how to implement the activities. Task 1.1 leader is avalable to support the implementation of the activities in the fiels. One key steps of this task is the production of D1.1 for each LL. Each country team should organised to their activities to deliver the report by end of July.

6. Methodological sheet

- Methodological sheet 1 : Desk review
- Methodological sheet 2 : Innovation tracking
- Methodological sheet 3 : Mapping of actors
- Methodological sheet 4 : Key informant interview guide
- Methodological sheet 5 : Baseline survey methodology
- Methodological sheet 6 : Baseline survey tool
- Methodological sheet 7 : Terms of Reference of an LL inception workshop
- Methodological sheet 8 : Problem tree tool
- Methodological sheet 9 : Co-construction of progress makers (process indicators)
- Methodological sheet 10 : Outline of the first report
- Methodological sheet 11 : Outline of the final report

Methodological sheet 1 : Desk review

1) Description of the tool/approach

A desk review is a research method where you analyze existing documents, reports, publications, and other secondary data sources without collecting new primary data. It's essentially a structured way to gather and synthesize information that already exists.

Key characteristics of a desk review include:

1. Secondary research focus - It relies on reviewing existing information rather than generating new data through surveys, interviews, or observations.
2. Document-based - Sources typically include academic literature, policy documents, project reports, statistical databases, organizational records, and other published materials.
3. Non-fieldwork approach - The research is conducted "at a desk" rather than in the field, hence the name.
4. Cost-effective method - It's generally less expensive and time-consuming than primary data collection methods.
5. Systematic approach - Despite using existing information, a proper desk review follows a structured methodology with clear research questions, search strategies, and analytical frameworks.

2) Why using this tool/approach

Desk reviews are commonly used to:

- Establish the current state of knowledge on a topic
- Identify gaps in existing research
- Inform the design of subsequent primary research
- Provide context for evaluation or decision-making
- Generate baseline information for projects or programs

In the context of living labs, a desk review would involve analyzing existing literature and documentation about living lab context, implementations, and outcomes to identify patterns, best practices, and lessons learned.

3) How to implement this tool/approach (when)

To implement a desk review on living labs, follow these steps:

1. Define your research question and objectives - Clearly articulate what you want to learn about living labs through your desk review.
2. Establish inclusion/exclusion criteria - Determine which types of documents and sources will be relevant to your review. Use Table 1 & 2 of that document.
3. Identify key databases and sources - Select academic databases, conference proceedings, institutional repositories, and grey literature sources that cover living lab context

4. Resource identification
    a. 4.1. Identify resources that are already available in your own database and those that are available with the consortium partner.
    b. 4.2.. You can research information in an external database (e.g. https://agritrop.cirad.fr/) and develop a comprehensive search strategy - Create appropriate search terms and boolean operators related to the living labs and the topics we want to cover (Cf Table 1).
5. Screen and select relevant literature - Review titles, abstracts, and full texts to identify documents that meet your criteria.
6. Extract and organize data - Create a systematic framework for extracting information about the living lab using Table 1 & 2.
7. Synthesize findings around the key topics of the contextual analysis, existing endogenous innovations, Permanent actors in the area and functions, Project interventions in the last 5 years and links among the identified actors.
8. Document limitations of existing knowledge - Note information gaps.
9. Prepare your review document. Based on the structure of the report (Methodological sheet 10)
10. Validate findings - during the LL inception workshop

4) How to store the data

The data of the desk review will be stored in the various Excel files available on the

1. T.1.1. Internal online data collection : https://docs.google.com/spreadsheets/d/1y52CJhwwd2VaVmmXPztzDrW68Nk2jwvl/edit?usp=drive_link&ouid=117777430839472535452&rtpof=true&sd=true
2. Existing endogenous innovations, events, actors, projects : https://docs.google.com/spreadsheets/d/1dHSNPca5Drk5RHAK790ryKmlwW3AV7fL/edit?usp=drive_link&ouid=117777430839472535452&rtpof=true&sd=true

Methodological sheet 2 : Innovation tracking

In Galileo, we will not use a proper innovation tracking approach as will adapted the innovation tracking based on the various sources of data that we will use : desk review, key informant and LL workshop.

1) Description of the tool/approach

The 'innovation tracking' method (Salembier et al. 2021, Paget et al. 2022) is based on a series of five stages, the aim of which is to flush out atypical practices, describe and analyse the underlying logic, evaluate the practices and ultimately offer support for the (co-)design of innovation (Blanchard et al. 2017). These pratices can includes new ways of producing but also new ways of packaging marketing and valorizing agroecological practices for example.

2) Why using this tool/approach

Endogenous innovation provides information on agricultural and organisational practices that have potential in the context of the future LL. The innovators, who are the driving force behind these practices, are also key people who have proven their interest in the agricultural field. They are resource persons for the animation of the living labs and the technical exchanges between producers.

3) How to implement this tool/approach (when)

The methododology includes five steps that have been adapted to Galileo data collection and analysis plan :

Step 1: Defining a tracking projet	Step 2: Unearthing on farm innovations	Step 3: Getting to know innovations	Step 4: Analysing learning from innovations	Step 5: Generating knowledge on the innovations
•Initiate the plan of innovation tracking based on Galileo plan of data collection	•identify innovations trough the desk review, the key informant interviews and the partners knowledge	•Complete information about the innovation from the various approach of data collection	•include the learning on the innovation in the excel sheet on endogeneous innovation	•During the inception workshop time could be create to assess the innovation (a comprehensive grid could be produced by WP2)

Definition (of the reference system) and tracking project

Tracking is an exploratory approach that deepens knowledge of the context. The reference system corresponds to the most widespread uses in the agrarian system (Link WP5 / Baseline) . Innovative practices are those that stand out from these uses. As uses are evolving (e.g. solarisation of pumping, digitisation) the boundary between innovation and the usual is porous.

The field of uses studied must also be defined:

- Innovations in agricultural practices (varieties, ITK, etc.)
- Organisational innovation (e.g. on sectoral issues: selling vegetables in baskets via WA, contracting, etc. on territorial issues: ?)
- Technical innovation (use of exotic equipment and tools)

Identification of innovations

We will identify innovations trough the desk review, the key informant interviews and the partners knowledge To identify a range of atypical cases, we will use the 'snowball' method.

As part of activities in WP2, further steps will be conducted to get more information about the innovations:

We will contact X innovation leaders identified through the field experience gained by the project teams during the mapping of stakeholders, key informant interviews, and the LL workshop. These contacts will be interviewed (to describe and understand the logic of the innovation, their sources of inspiration and their potential applicability, scalability, etc. see next point). These initial contacts will also direct us towards other innovators. *The process ends when we consider that we have reached a state of saturation, at the stage where the newly interviewed no longer mention solutions that are unknown to us.*

Characterisation and typology of solutions

Characterisation of innovations will be based as a first stage on the information that will be collect from the various appraoches mobilised for task 1.1.

As part of activities in WP2, further steps will be conducted to get more information about the innovations:

During the identification of innovators, semi-directive interviews are conducted in order to describe their solutions. The purpose of the interviews was to collect the information necessary to analyse the operating logic of each innovation. The objectives are:

- to identify the type of actor who carries out the innovation (typology of farmer)
- to understand the innovation itself and the reasons (economic, social, environmental, etc.) behind the (potential) adoption of the solution.
- identify the genesis, results and effects, the subjective originality of the solution, the partners, the difficulties encountered in its use, the approaches adopted to overcome the difficulties, the improvements envisaged, the factors of success and advice for dissemination.

The elements obtained for each innovation will be transcribed on a summary page. The innovations are then classified according to their type (agricultural practice, organisational practice, technical).

Co-evaluation of solutions (link with LL method).

The level of interest of the innovations will be classified according to a performance scale to be developed by consensus in the LL. The important criteria for the interest of the innovations to be tested by subsequent research concern environmental, social and economic sustainability, the hybridisation capacity of these innovations, and their adaptability to large-scale replication. This activity can be conducted during the LL inception workshop.

How to store the data

The data can be sored in the Existing endogenous innovations, events, actors, projects Excel file in the sheet 'endogeneous innovation' : https://docs.google.com/spreadsheets/d/1dHSNPca5Drk5RHAK790ryKmlwW3AV7fL/edit?usp=drive_link&ouid=117777430839472535452&rtpof=true&sd=true

Additional resources

Tracking Innovation approaches : https://youtu.be/E_epo_KuBT8

D-LIFT Padlet on innovation tracking : https://padlet.com/Service_DeSIRA_LIFT/special-training-session-tracking-innovation-traque-aux-inno-8h5iwswovbvxgmzl

Methodological sheet 3 : Mapping of actors

1) Description of the tool/approach

Various mapping actors mapping tools exist in the literarture. A mapping is used on purpose to understand how actors are organised for this specific purpose. In Galileo, as we are working on supporting and developping innovations in AFS. We suggest to use the Agrigultural innovation system (AIS) approach and identify the actors that are involved in supporting innovations in AFS domain. We can use the typologie of innovation support service providers (ISP) and the innovation support services (ISS) to identify the actors and their role in the AIS.

2) Why using this tool/approach

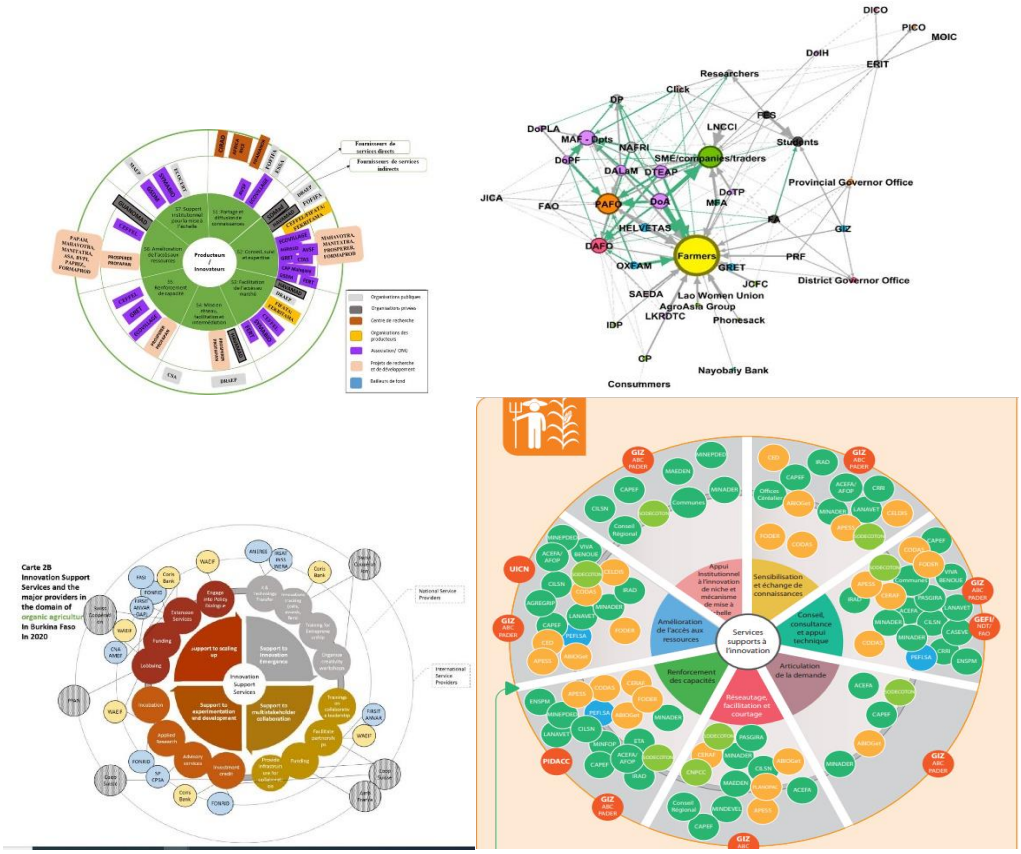
This tools will help to have a better understand on how the actors are organised in the LL when it comes to innovation purpose and know who to mobilise in support of the innovations that will be co-developed within Galileo. The idea is to embedded as much as possible the innovation that will be developed in an existing innovation ecosystem.

3) How to implement this tool/approach (when)

The data will be collected trough the desk review and the key informant interviews. The ISS are identified based on their nature Public organisation, Private organisation (value chains, entrepreneurs, firms, certification bodies, land owner….), Farmer based organisation (FO, Cooperative, …), Civil society (NGO, Think thank, ….), Informal actor (customary authority (village), religious authorities, Coaxers, …..). The function and the services are based on the ones described in the ISS literature (Faure et al. 2019, Audouin et al. 2021, Ndah et al. 2021, Mathe et al. 2023) : Access to ressources, Sensitation and knowledge sharing, Marketing, Technical support, Capacity building, and Institutional support.

Link among the various actors can be identified. It could be based on formal (contract, grant agreement, ….) or informal (tacit or gentlemen arrangement, ….) from current or past collaborations to support innovations in the area.

An adapted visualisation tool can be used some examples are available below :



4) How to store the data

The data can be stored in the Actors sheet in the Excel database : https://docs.google.com/spreadsheets/d/1dHSNPca5Drk5RHAK790ryKmlwW3AV7fL/edit?usp=drive_link&ouid=117777430839472535452&rtpof=true&sd=true

5) Related tools / additional resources

Tools to collect data for ISP and ISS mapping : http://agritrop.cirad.fr/604377/

Guidelines for applying the methodology and tools for characterizing innovation support services and providers, SERVInnov project : http://agritrop.cirad.fr/595611/

Methodological sheet 4 : Key informant interview guide

A) Presentation of Galileo project and objective of the interview

B) Concent form : link

C) BEGINNING of observation_____

1) Country and LL :
2) Name :
3) Organisation :
4) Functions in the organisation (since when) :
5) To what extend do you know *(cite the area of the Living Lab)* : Expert/ Knowledgeable/Fair/ Low
6) Concerning this area, what can you say about :

	Description/ Information	**Sources of information**	**Document available**	**Where ?**
1. Ecological data (Meteorological and Climatic data and past shocks and events for the last 10 years, soil type, vegetation type, Biodiversity hotspots and conservation activities)			Yes/No	
2. Agricultural system (Project in the last 5 to 10 years, Agricultural dynamics, Typology of agroforestry system, prefered trees, Farming system,)			Yes/No	
3. Socio-economic data (Population density, poverty level, market access, main source of income/ opportunity cost of non-agricultural activities, firms, villages..)			Yes/No	
4. Institutional data (Farmer organisation, Infrastructure, important regulations that can affect our work as Communal land planning, previous innovation platform)			Yes/No	

7) What have been the major historical events that have marked this area over the last 20 years (2 firsts colunms of the table) ? In your opinion, what consequences might these major events have on the development of agroforestry in the area (last column of the table) ?

Historical event	**When ?**	**Consequences on agroforestry development**

8) In you r opinion what are the main current of forcoming opportunities in this area ?

9) What have been the may intervention (project) in the area this last 5 years ?

Project Name	**Intervention**	**Organisations involved**	**When**

10) Who are the major players who operate or have operated in this area?

Name	**Organisation**	**Type of actors** *(Public organisation, Private organisation, Farmer based organisation, NGO, Informal actor)*	**Main functions/services in the area** *(access to ressources, sensitation and knowledge sharing, marketing, technical support, capacity building, Institutional support……)*	**Who are the beneficiaries** *(individual, formal PO, informal group, intermediary organisation)*	**Conditions to benefit from th service**
	Yes/No				
	Yes/No				
	Yes/No				

11) Have you identified any (promising) innovations or innovative initiatives - related to AF- in the area? Yes/No
12) If so which one ?

Description of the innovation or innovative initiatives	**Innovation 1**	**Innovation 2**	**Innovation 3**
The novelty (newness) of the innovation: *What is the technical, organizational, social and methodological innovation with regards to what already exists? It is a question of the novelty of the solution, taking into account the context, time and unity of adoption. The chosen case will be considered as an innovation if it is perceived as new for its adoption unit.*			

Localisation *(or geolocalisation if possible)*			
Who initiate the innovation?			
Who is/are the actor(s) involved			
The central challenge to which the proposed innovation responds			
The scale of innovation (farm level, value chain, market, territorial level):			
The phase of the innovation process: **Initiation/Emergence (***creative activities, designed by a very small group of actors, generally informal, around an idea of innovation***),** **Implementation/Development (***experimentation and/or adaptation activities, according to an action plan, by an organized group of actors (community, consortium, network, etc.)***),** **Dissemination/Diffusion:** ***use by actors who have not participated in the emergence or development, dissemination of innovation through intermediary organisations and/or political institutionalisation***			
Main/obstacles to successful innovation (optional item)**:** *What are the main obstacles to the emergence, development or scaling up of innovation today and which justify the need for support services to be provided?*			
Potential to affect sustainable agriculture and the agrifood system			
Alignment with national priorities? How is it linked to a political agenda?			
List any available documents and or references to the innovation			
Contact persons (name, organization, contacts)			

13) Do you have any additional documents that you would like to share with us?

14) Would you like to recommend someone we should meet to enrich our information base?

Name	**Organisation**	**Function**	**Contact**

15) Would you like to be informed about the activities of the Galileo project? Yes/No
16) If so, what are you most interested in?

17) Thank you for your time. Do you have any questions for us about the Galileo project or the interview we have just had?

END of the interview_____

Methodological sheet 5 : Baseline survey methodology

To be completed by WP5

Methodological sheet 6 : Baseline survey tool

To be completed by WP5

Methodological sheet 7 : Terms of Reference of an LL inception workshop

1. Main objectives

The main objective of the LL inception workshop is to :

- Receive feedback from the desk review and the key informant
- Validate the diagnosis as a common knowledge
- Start engage the actors in the LL
- Collect additional data
- Identify and prioritise challenges to overcome
- Agree on the willgness of all the actors to contribute to a co-creation process
- Co-develop indicators to monitor the process of co-creation

2. Logitics

An **organisation Committee** should be set up. It should include all the project partners involved in that activity in the LL including the partners on the field to prepare the venue, mobilise the actors and organise the food/beverage.

The workshop includes 20 to **22 participants** fo llowing the distribution in the table below.

Type of actors	Nb.
Farmers (male/female/youth)	6-8
FO representatives	2
Research	4
Development agency	2
NGO	2
Extension officers	2
Private sector (e.g. input dealer)	2
Other key actors according to the LL	2
Total	22-24

The workshop will be organised during **2,5 days** to be able to have quality discussion without being stressed by the time pressure. It could be reduced to 2 days if the logistics is too complex.

The **venue** should :

- Be booked in a room located in the living Lab area
- Be accessible easily by all the participants during the 2,5 days
- Be a place where all the participant fill free and secure to discuss

The workshop should take place between **2nd half of June (after submission of the first report on T1.1) and end of August**, 2025.

A **budget** should be established by the organising committee to collect the necessary **funds** from each partner.

3. Methodology

The draft of the agenda includes collective activities.

DAY 1	Morning	Presentation of particpants (icebreaker exercice) Presentation of the project Data completion/Validation of diagnosis - Contextual data
	Afternoon	Data completion/Validation of diagnosis : - Key actors - Project - Existing innovation
DAY 2	Morning	Prioritazitation of Challenges and opportunities (group work) Problem tree with the most significant problem (related to agroforestry) *(Methodological sheet 8 : Problem tree tool)* Restitution
	Afternoon	Who to partner with in the LL to find solutions ? Exercise of delimitation of the LL action/field site (using a map) ***It is an optional exercise, it can be used for T1.2 (so the last session of day 3 can come afternoon of day 2)***
DAY 3	Morning	What do we want to acheive together Co-contruction of indicators (progress makers) Modalities of monitoring of the indicators *(See Methodological sheet 9 : Co-construction of progress makers (process indicators)*

A **facilitator** should be identified. It should be an external person, if not someone neutral who can speak the local language and English or French. The role of facilitator will be to support the implementation of all the activities planned in the agenda and also be sure that all the participants feel comfortable to contribute by paying attention to balance power relationships. Facilitation is not manipulation !!!! No “Facipulation” ! It could be good to develop a facilitation plan to have a clear idea of who is doing what and the material needed for each working session.

Also it is important to identified **note takers** that are trained to identify the key points that should be considered for the next steps particularly for the co-creation process.

The **material** needs for the workshop include :

- Project Roll-up
- Paper board
- Markers
- Large post-it
- Map of the area

The methodological sheet 8 and 9 provide the methodology for the Problem tree exercise and the Co-construction of progress makers (process indicators).

- **NB. The process is as important as the result. All the exercises contribute to deliver products such as the problem tree. But the process of developing that product together plays a key role in the common understanding of challenges (sense making) and also in the**

building of trust. That's why a smooth facilitation is key to produce quality products and processes.

Methodological sheet 8 : Problem tree tool

NB : This methodological sheet is an adapted version of the tool facsheet of CDAIS project on Capacity-focused Problem Tree : https://tapipedia.org/content/tool-factsheet-capacity-focused-problem-tree

1) Description of the tool/approach

The problem tree is a tool for discovering solutions by uncovering the anatomy of cause and effect around an issue. It is analogous to a mind map, but more structured. Participants have an opportunity to indicate their priorities.

2) Why using this tool/approach

This tool leads to a collective understanding of the chief problems; encourages the participants to think about multiple causes and effects; and support of prioritization of key entry point to solve the issues.

3) How to implement this tool/approach (when)

The approach includes 6 major steps that will be deployed during the LL inception workshop :
Step 1: Start by brainstorming about all major issues relatins to AFS. Within the group, decide on the core issues/problems relating to the enabling environment, organizations and individuals.
Step 2: Draw a “tree” and write the key problem on the trunk. If you think there is more than one key problem, you need to draw one tree per problem.
Step 3: Encourage the stakeholders to brainstorm on the causes of the key problem and write them on cards. Prioritize the causes.
Step 4: Discuss the factors that are possible contributory causes of the key problem. Focus on the factors that are potential drivers of change and write them on the roots of the tree.
Step 5: Look at the effects/impacts of the problem, and write down the primary effects on the branches of the tree.
Step 6: The diagram generated in this exercise provides a basis for discussion and can be converted into a objectives tree, turning the negative statements into positive ones.

When you use this tool don’t forget to give poeple enough time to explain their reasoning. Write down on a separate piece of paper related ideas and points that come up, and put them under headings such as: solutions, concerns and decisions.

Here are some questions to facilitate the discussion :

- Does this represent the reality of the situation? Have the economic, political and sociocultural dimensions of the problem been given due consideration?
- Which causes and effects are getting better, which are getting worse, and which are staying the same? What are the most serious effects? Which effects are most worrisome? What criteria are important to us as we think about a way forward?

- Which causes are easiest/most difficult to address? What possible solutions or options might there be? How might a policy change address a cause or effect, or deliver a solution?
- What decisions have we made, and what actions have we agreed upon?

4) How to store the data

The picture of the problem trees developed in each LL can be stored : https://drive.google.com/drive/folders/1DqzErU_gS3xkcY29SQ-itRlE0gUpNm5i?usp=drive_link

5) Related tools / additional resources

Problem Tree- MSP Guide : https://mspguide.org/2022/03/18/problem-tree/#:~:text=What%20is%20a%20Problem%20Tree,map%2C%20but%20with%20more%20structure
.

How to use a problem tree analysis : https://youtu.be/q6qYZiW5BWU

Methodological sheet 9 : Co-construction of progress makers (process indicators)

1) Description of the tool/approach

Progress markers are part of a system of Monitoring, Evaluation and learning (MEL). Progress are successive milestones for measuring the progress made towards achieving the desired change. A Progress Marker is a smaller anticipated action that contributes to overarching outcomes. Tracking progress markers enables teams to show incremental changes in progress made in the short- term.

2) Why using this tool/approach

Progress markers are performative. It means that when you formulate it, it help to ease the realisation of the statement. That why it drives learning and capacity building that foster the upcoming cocreation process.

3) How to implement this tool/approach (when)

The PM will 46ec o-constructed during the LL inception workshop.

PMs are graduated indicators of changes in the knowledge (K), attitudes (A) and practices (P) of stakeholders or stakeholder groups (KAP model). For the activity of cocreation, PMs corresponding to 3 different levels are formulated : (1) what is expected, (2) what is desired, (3) the ideal. The changes can be perceived at individual, collective, organisational or partnership level and are assessed collectively at the mid term and the final term of the co-creation process that mark out the capacity-building process.

Some questions that could be asked :

- What do you expect in terms of exchange or creation of knowledge furing the cocreation process ?
- What would you like to see as change of behaviors during the cocreation process ? Whom ?
- What change in practices would you expect to see ? Whom

The statement should be formulated as :

- A sentence with an action verb
- A subject (precise whom) is doing what
- Clear statments

Example of a table of progress markers deloped to follow partnership in a reasearch project

OBJECTIFS PRIORITAIRES	Expect to see	statut 0/1/2	EXPLICATIONS						
	CEDRES owns the project	NSP		Like to see	statut 0/1/2	EXPLICATIONS	Love to see	statut	EXPLICATIONS
P1: Bringing partners in the same space	IECD moblise le staff compétant et disponible pour le projet	NSP		IECD met en œuvre les récommendations issuent du projet	NSP		Servinnov contributes to the improvement of the new extensionist through modules dedicated to	0	
	Les WP leaders confirment bien leur rôle	1	1 POUR ESSA POUR WP3	Coordination team manage to facilitate dynamic and exiting meetings	2	MADA	IECD crée un service interne dédié à l'innovation	NSP	
	MINRESI signe les documents pour mettre à disposition les financements pour l'Université de Dschang	1	EN COURS	IECD crée de nouveaux partenariats à l'échelle nationale et internationale	NSP		Manuel developed is adopted as reference document by innovation providers	0	
	All partners are clear of project goals and expectations	1	EN COURS ET LES ATTENTES SE CONSTRUISENT ENCORE	Partners have a commmon understanding of key concepts	1	IL RESTE DE DISCUSSIONS A ORGANISER SUR DES TYPOLOGIES, DES METHODES	Policy markers adopt our recommandations to improve ISS in the 3 countries	0	
	All partners are clear of the specific responsibilities linked with WPs	1	WP4 ET WP5 : à préciser				tous les partenaires construisent le cadre conceptuel et méthodologique	1	GRACE AUX REUNION ET WORKSHOP
	Les partenaires de développement restent intéressés au	2	FIFATA				les différents parties prenantes harmonisent leur	1	
	Les chercheurs comprennent les problématiques sur le	2					Parters make use of the same terminology	0	
	Partners share common language on ISS	1	EN COURS						
	All SERVInnov partners communicate around delivrable		A CHANGER						
	Tous les partenaires sont tous impliqués dans le projet et se sentent responsables de sa réussite	1	WP3 N'A PAS DEMMARE						
	IECD et AGRO-PME aident les chercheurs à avoir une vision	NSP							
P2: Aligning actions around the same framework	Les partenaires se mettent d'accord sur les livrables précis attendus	1	Certains partenaires n'ont pas réagi à la rédaction des livrables						
	Partners join in designing a common framework	2	Le livrable sur le cadre conceptuel a été validé par les acteurs	Country fora invited within the project in the 3 countries	0,5	Les forums pays ont eu lieu seulement au Cameroun	les principaux bénéficiaires utilisateurs s'impliquent dans les espaces d'orientations	0,5	L'IECD et FIFATA se mobilisent dans les espaces d'orientation
	IECD met ses projets à disposition pour analyse/étude de cas	2	Mise à disposition par l'IECD de ces projets (APONH et TRANSFORM) au Cameroun pour la phase exploratoire et le WP2 et un cas à venir (APONH) pour le WP 3	Country fora involved in the mapping of innovation providers	0	Les groupes AFAAS n'ont pas été impliqués parce que les liens avec eux ne sont pas consolidés pour le moment	usefulness of framework is proven by field work	1	Le Burkina-Faso n'a pas mobilisé les cadres théoriques (typologie)
	Inventories and case studies are conceptually based on D11	1	Les caractérisations ont mobilisé le cadre conceptuel	AFAAS takes advantage of international events to reach policy makers at continental level	0,5	Le side event de Côte d'Ivoire a permis de communiquer au			
	Framework be accepted and ready for use by all	X	Il faut préciser le terme "framework"	WP2+3 make full use of guidelines provided (D12, D13)	X	Il faut préciser le terme			
P3: Ensuring relevance/outcomes for end users	Practionner partners understand need of research and vice vesa	1	FIFATA bien , IECD OK et GRET =0						
	All partners enabled to diagnosis and assess ISS and ISP	1	Tous les livrables non disponibles	LaF gets involved in SERVInnov BKF	0	N'est pas encore arrivé mais cela	l'agence de conseil en construction au Cameroun s'inspirent des resultats de SERVINNOV	0	L'agence n'a pas été mis en place
	AFAAS repackages contents using format that better matches each target audience	0	Pas suffisemment de communication	Researchers manage to build oriented-action frameworks	0	Pas pertinent. Il faut le supprimer car pas	Agro PME et l'IECD travaillent en réseau sur des projets dans la zone de Djombé	1	Agro-PME n'est pas encore suffisemment
	Country teams quickly identify motivated and interested end-users	0	Pas encore d'actions à ce sujet	(WP1) partners have tested auto-evaluation tool	0	Outil non constitué	WP4 team produces useful guides in a timely maner	0	Pas de guide disponible à jour
	Les partenaires partagent le même vocabulaire sur les services de support	1	Les concepts restent beaucoup en débat. Critique	D'autres praticiens veulent être impliqués dans le projet en proposant des cas qu'ils piloteraient et financeraient	0		les étudiants impliqués dans SERVINNOV sont recrutés par les agences de developpement sur les questions d'innovations	0	Pas de recrutement à ce jour
				Le guide de SERVInnov est insérédans le kit du	0	Pas arrivé			
P4: Financial tracking and ressource mobilization	AFAAS put in place all communication tools for the project	1		Les programmes nationaux de vulgarisation s'inspirent des résultats du SERVInnov	1	e.g Mada, the FIFATA extesion sytem is already getting inspired			
	Allocated budget is spent for purposes designed and no major deviations occur	1	Mada, unexpected expensis for consultants earlier lanned for Students, Cam, funding not recieved at all				le NEPAD souhaite financer la mise en œuvre de SERVINNOV dans d'autres pays	0	pas très réaliste
	All partners collaborate to the development of the common strategy	1	AFAAS's collaboration has been unstable e.g meeting attendance, continuing of Project actors, dely in Website Dev't				Allocated budget is sufficient and activities amerging in the course of the projet can be a realised	0	

4) How to store the data

Data can be stored (one sheet should be created to each LL): https://docs.google.com/spreadsheets/d/1qns4XVgD0pbVE9AtMH-pjFzU8m5BHJlOoUqgDKqBwkM/edit?usp=drive_link

Methodological sheet 10 : Outline of the first report

1. Introduction

2. Summary of the ID of the LL (use also a Map if possible)

3. Methodology used in brief

4. Results

    1. Ecological data (Climate, soil type, vegetation type, ..)
    2. Agricultural system (Project in the last 5 to 10 years, Agricultural dynamics, Typology of agroforestry system, prefered trees, Farming system,)
    3. Socio-economic data (Population density, poverty level, market access, main source of income, ..)
    4. Historical data (important past events in the LL, highlights)
    5. Instititutional data (Farmer organisation, Infrastructure, important regulations that can affect our work)
    6. Challenges and opportunities
    7. Existing endogenous innovations (type of innovations)
    8. Mapping of actors (Diversity of actors, Functions of actors)
    9. Project intervention in the last 5 years (type of intervention)

5. Conclusion for Galileo intervention

6. References

Methodological sheet 11 : Outline of the final report

1. Introduction

2. Summary of the ID of the LL (use also a Map if possible)

3. Methodology used in brief (including LL inception workshop and Baseline)

4. Results

4.1. Updated Results from desk review and key informant

1. Ecological data (Climate, soil type, vegetation type, ..)
2. Agricultural system (Project in the last 5 to 10 years, Agricultural dynamics, Typology of agroforestry system, prefered trees, Farming system,)
3. Socio-economic data (Population density, poverty level, market access, main source of income, ..)
4. Historical data (important past events in the LL, highlights)
5. Instititutional data (Farmer organisation, Infrastructure, important regulations that can affect our work)
6. Challenges and opportunities
7. Existing endogenous innovations (type of innovations)
8. Mapping of actors (Diversity of actors, Functions of actors)
9. Project intervention in the last 5 years (type of intervention)

4.2. Additional results from the LL inception Workshop

4.3. Preliminary results of the baseline survey

5. Conclusion for Galileo intervention

6. References

7. References

ALLEBONE-WEBB, S., B. DOUTHWAITE, E. HOFFECKER, S. MATHE AND B. TRIOMPHE, (2016), *What is capacity to innovate and how can it be assessed? A review of the literature*,

AUDOUIN, S., P. DUGUE, N. RANDRIANARISONA, H. T. NDAH, T. RATSIMBAZAFY, H. ANDRIAMANIRAKA, E. S. NOHARINJANAHARYA, N. RALISOA AND S. MATHE, (2021), Which place of agricultural advisory services among innovation support services in Madagascar? *CAHIERS AGRICULTURES* 30.

BLANCHARD, M., É. VALL, B. T. LOUMBANA AND J.-M. MEYNARD, (2017), Identification, caractérisation et évaluation des pratiques atypiques de gestion des fumures organiques au Burkina Faso: sources d'innovation? *Autrepart* 81(1): 115-134.

FAURE, G., A. KNIERIM, A. KOUTSOURIS, H. T. NDAH, S. AUDOUIN, E. ZAROKOSTA, E. WIELINGA, B. TRIOMPHE, S. MATHE AND L. TEMPLE, (2019), How to strengthen innovation support services in agriculture with regard to multi-stakeholder approaches. *Journal of Innovation Economics Management*(1): 145-169.

KLERKX, L., N. AARTS AND C. LEEUWIS, (2010), Adaptive management in agricultural innovation systems: The interactions between innovation networks and their environment. *Agricultural systems* 103(6): 390-400.

KLERKX, L. AND P. GILDEMACHER, (2012), The role of innovation brokers in agricultural innovation systems. *Agricultural innovation systems: an investment sourcebook. Washington (DC): World Bank*: 221-230.

KLERKX, L., A. HALL AND C. LEEUWIS, (2009), Strengthening agricultural innovation capacity: are innovation brokers the answer? *International Journal of Agricultural Resources, Governance and Ecology* 8(5-6): 409-438.

LEEUWIS, C. AND N. AARTS, (2011), Rethinking communication in innovation processes: creating space for change in complex systems. *Journal of Agricultural Education and Extension* 17(1): 21-36.

MATHE, S., G. H. FONGANG FOUEPE, M. SONFACK, L. TEMPLE, J. ABEGA NDJANA AND M. B. TALLA SADEU, (2023), New challenges for innovation support services to improve cocoa quality and sustainability in Cameroon. *Science, Technologie, Développement* 3(1): 17 p.

NDAH, H. T., S. AUDOUIN, S. CRESTIN-BILLET, N. RANDRIANARISONA, H. ANDRIAMANIRAKA, A. TOILLIER, O. TRAORE, G. H. FONGANG FOUEPE, S. MATHE AND A. KNIERIM, (2021), Dynamics and diversity of innovation support services: Especially networking service activities on selected agro-food innovation cases in Madagascar and Burkina Faso, *Proceedings in System Dynamics and Innovation in Food Networks 2021*, Bonn, Allemagne, University of Bonn.

PAGET, N., I. S. NACAMBO, S. FOURNIER AND I. MOUMOUNI MOUSSA, (2022), Traque des innovations numériques au service de la transition agroécologique au Bénin. *CAHIERS AGRICULTURES* 31(10).

PANT, L. P. AND H. HAMBLY ODAME, (2009), The promise of positive deviants: bridging divides between scientific research and local practices in smallholder agriculture. *Knowledge management for development journal* 5(2): 160-172.

SALEMBIER, C., B. SEGRESTIN, B. WEIL, M.-H. JEUFFROY, S. CADOUX, C. CROS, E. FAVRELIERE, L. FONTAINE, M. GIMARET AND C. NOILHAN, (2021), A theoretical framework for tracking farmers' innovations to support farming system design. *Agronomy for Sustainable Development* 41(5): 61.

TOILLIER, A., A. DEVAUX-SPATARAKIS, G. FAURE, D. BARRET AND C. MARQUIE, (2018), Comprendre la contribution de la recherche à l'innovation collective par l'exploration de mécanismes de renforcement de capacité.

VAN EWIJK, E. AND M. A. ROS-TONEN, (2021), The fruits of knowledge co-creation in agriculture and food-related multi-stakeholder platforms in sub-Saharan Africa–A systematic literature review. *Agricultural systems* 186: 102949.

WORLD BANK, (2006), *Enhancing agricultural innovation: How to go beyond the strengthening of research systems,* World Bank.