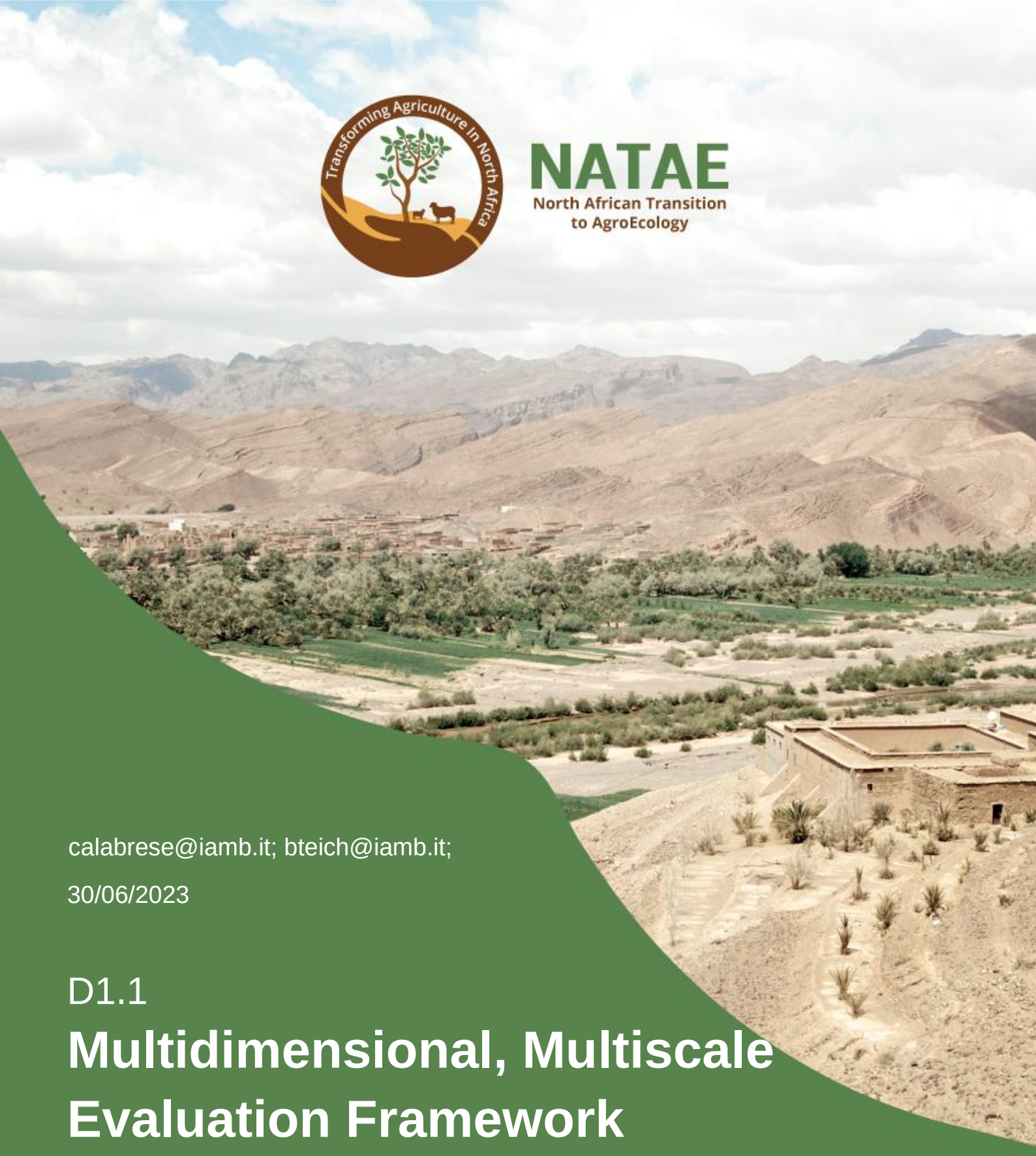

NATAE
North African Transition to AgroEcology

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D1.1

Multidimensional, Multiscale Evaluation Framework

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Acronyms and abbreviations

Abbreviation	Full form
AE	Agroecology
AEP	Agroecological practice
AET	Agroecological Transition
AVACLIM	Value Agroecology for Dryland project
ESs	Ecosystem Services
GTAE	Groupe de travail sur les transitions agroécologiques
HLPE	High Level Panel of Experts
LL	Living Lab
MDGs	Millennium Development Goals
NBS	Nature-Based Solutions
SDGS	Sustainable Development Goals
T*APE*	Tool for Agroecology Performance Evaluation

Executive Summary

This document is the Methodological Framework for the Assessment of Performance of Agroecological Practices envisaged in the task 1.2 of the project NATAE (D1.1) and it is developed in interaction with the NATAE Living Lab Guidelines (D4.1) that aims to Design a participative approach adapted to agroecological LL in North Africa (T4.1) and to set up Living Labs and Replication Labs in NA contexts (WP4).

This deliverable is the result of a collective cooperative work of co-creation[1] among all project's partners including high-level research institutions, international organisations, and NGOs with strong experience on AE approaches.

The multiscale multidimensional evaluation framework builds on the preliminary report developed in Task 1.1. This report done by CARI, is about the pre-existing methodological frameworks that deal with sustainability and agroecological transition (AET) of food systems in mainly the South. After having reviewed 14 assessment methods with regards to agroecology, agriculture, environment and sustainability (Darmaun et al, 2023), the CARI has focused on methodologies both relevant to (North) African region and directed to agroecology only (Mottet et al, 2020; Levrard et al, 2023). They also elaborated their own assessment methods through their AVACLIM project[2].

The report highlights a number of featuring aspects of the three methodological frameworks analysed that deserved to be shared and discussed among the partners. It drafted a basic database composed of all the indicators developed by these frameworks of reference.

These methodological frameworks offer tools for evaluating the performance of agroecological practices, providing sets of clear indicators to be elaborated on the basis of the available data collected. The developed methodologies try to interpret what is happening at the territorial level on the basis of contextualized data collected at the farm level. They characterize, feature and assess different levels of agroecology within the farms, according to specific dimension and criteria, but they do not set the evaluation of the performance of agroecological practices as the main objective of the evaluation.

In the case of NATAE, the methodological framework is mainly aimed at evaluating the performance of agroecological practices and at proposing combinations of AEP. The members of the project consortium were involved in a process designed to create the basic structure of this methodological framework and to decide not only on the main purpose, but also its degree of complexity, who are the users and the degree of flexibility of the indicators to be chosen and used.

The co-creation work was introduced to the partners in the kick off meeting of January 19th 2023. The 1st workshop to build the multiscale multidimensional evaluation framework was held in Session1 of the NATAE's consortium meeting held in Bari in April 26-28, 2023. The opinions of the attendants about a number of relevant issues that could feature the evaluation tool (including both the evaluation framework and the indicators) were collected through a questionnaire administered to all partners present at the Meeting (see Questionnaire for the 1st participatory

[1] By co-creation we mean "*the enactment of creation through interactions*" (Ramaswamy and Ozcan, 2018) that in the case of NATAE is the direct engagement of people in generating systems, products or services and in adding value through collaboration and direct participation.

[2] https://avaclim.org/

workshop on the multidimensional multiscale assessment framework). 46 people answered to the questionnaire. The results from the questionnaire were reported during a 2nd workshop held on-line on May 26th, attended by 29 people. During this 2nd workshop, following a suggestion made by the participants in the previous meeting, a first draft version of the glossary (Chapter 4) was introduced to partners and subsequently made available to all for comments reviews and suggestions on the project platform. In the third workshop (15th of June 2023), attended by 23 people belonging to the partner institutions, the final version of the Glossary was reported and the draft of the general conceptual framework and of the database with indicators were introduced and allowed for first modifications and additions by partners.

For transdisciplinary purposes, this process of internal evaluation will be re-opened in order to improve our views on the specific contents i.g. indicators that are more accessible to local users (i.g. cooperatives, producers etc.), or more adapted to living labs contexts.

For academic research purpose, this methodological framework is also a guide and support to WP2 WP4 WP6 and WP3 in their methodologies and data collection so as to include different dimensions of AE assessment. Meanwhile, it is a living tool that will evolve during the project implementation to include more indicators, especially on missing dimensions (governance for example).

The present framework is co-created by NATAE partners, and it will be revised, adapted and re-shaped all through the project length, providing a contribution to strengthening transdisciplinary research and integrated scientific support for relevant Eu policies and priorities (Eu strategy for Africa and Green Deal, ...) (Outcome 1)

The Multidimensional and Multiscale Evaluation Framework aims at evaluating the performance of AEPs. In a first phase, it will help the project community to analyse and identify AEPs combinations that have shown good performances in relation to various dimensions considered relevant to support AET. It shall contribute to identify AEPs combinations (Outcome 2).

In a second phase, when NATAE actions will reach a more advanced stage the framework shall support evaluating the performance of AEPs combination adopted and achieving an evaluation of AE strategies, as such it also contributes to improve the quantification and assessment of socio-economic and environmental performance of AE strategies (Outcome 3).

The multidimensional multiscale AEPs evaluation framework is composed of three different interconnected parts:

i. A conceptual framework including some conceptual aspects on agroecology and agroecological practices that constitute NATAE's common vision (Chapter 1 and 2)
ii. A set of indicators (Chapter 3)
iii. A short glossary (Chapter 4)

Chapter 1

Introduction

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Chapter 1 - Introduction

1.1 Why a new methodological framework

NATAE project aims at demonstrating that agroecological approach and actions, tailored locally to the diversity of farming systems, can offer adequate solutions to challenges that the food systems in North Africa face. The project seeks to identify optimal combinations of agroecological practices (AEPs), that could be adopted by local communities, by analysing the performance of already existing agroecological practices and experiences. The Framework represents a first step in developing a replicable methodology to design evidence-based locally-tailored strategies for agroecological (AE) transitions.

Despite the general well-documented positive impacts of agroecology and some changes that are starting to occur at farm, political and social levels in North Africa, unfortunately many AEPs do not immediately show up to be sustainable due to *i)* the lack of resources, maintenance and continuity, *ii)* the lack of support from public authorities or *iii)* the producers are not ready to accept them (social acceptability) and this limits the achievement of a wider territorial value and positive impacts in terms of rural development.

In addition, even if in recent years, agroecological initiatives and practices have increasingly been carried out by farmers, researchers and/or international cooperation agents, at the moment, an evaluation of the effectiveness of agroecological practices activated in North Africa is still lacking.

Most of the agroecological innovations take place on the plot and on the farm and it is therefore difficult to capture their positive value and/or their actual or potential economic and social impact due to the fragmentary nature of the initiatives, or to the farm dimensions in which these actions occur and to the paucity of social dimensions addressed, especially in reference to contexts in which the dominant agriculture remains conventional or even intensive. As a consequence, the visible impact or performance of AEPs result hidden by many context-specific obstacles of different nature requiring solutions from different fields of competences (Beudou *et al.*, 2017; El Bilali, 2019).

Since there is no certainty of the performance of the initiatives that have been carried out, there is also no certainty of the fact that the practices that have given positive and appreciable results in some contexts can prove to be equally positive in other places or territories.

The present methodological framework is a tool to assess and share the performances of such agroecological practices and combinations of practices.

The present document consists of an integrated and structured procedure/tool with different steps to be followed to achieve a multiscale and multidimensional assessment of the performances of AEPs (Gasparatos, 2010). It entails a set of predefined rules and includes a list of indicators and criteria (Lairez *et al*., 2015).

The structure of the conceptual framework builds on the basis of the understanding of the project requirements and of the co-creation process involving the Consortium members.

The methodological framework is a living document that will be gradually reshaped and refined all through the project to best accommodate the perceptions, needs and innovative ideas that will be generated, and finally it will become part of the NATAE Guidebook (D 1.3 due in month 48) and contribute to establishing the general methodological framing (MS 2 due in month 5) of the project.

Chapter 2

Conceptual Framework

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Chapter 2 – Conceptual Framework

The term “Agroecology” appeared for the first time in 1928 from the pen of the Russian-American agronomist Basil Bensin, whose conception of agroecology exclusively included the application of methods and concepts of ecology to agronomic research processes (Bellon *et al*., 2016).

Starting from the 60s and 70s, when the effects, even the negative ones, of the Green Revolution that imposed a development trend that could not be suitable for all environmental, economic and social contexts in which it was indiscriminately applied began to be felt (Hecht, 1995; Francis *et al*., 2003; Gliessman, 2007), we moved from the definition of scientific-disciplinary aspects to the practical application of ecological principles to agriculture.

The studies conducted on traditional productive agricultural systems in tropical and sub-tropical countries belong to the same period, and we begin to talk about Organic Agriculture and the application of ecology to agriculture becomes a topic of great interest. In those years, agroecology was enriched on the one hand by the study of agroecosystems (Odum, 1969) and by the identification of practices that guaranteed the conservation and protection of natural resources, which led to guidelines for the planning and management of agroecosystems (Altieri, 1989; Gliessman, 1997); on the other hand by the work of people like Conway (1987) who highlighted the close connection between agriculture and the social system, redeeming the environment and society and changing their role in production systems. An aspect that finally went from being an externality to being instead a property of systems, identifying productivity, stability, sustainability and social equity among the properties of agroecosystems.

Starting from the 90s, a new definition of agroecology emerged, which does not only concern agricultural systems, but the entire food system (Francis *et al*., 2003).

At the moment the term agroecology has different meanings and agroecology can be understood as a set of practices (in the broadest sense of the term), as a movement or as a scientific discipline, including approaches and skills at different levels and scales of intervention, from soil or field level studies, up to including the whole food system (Bellamy and Loris 2017; Méndez *et al*. 2013; Silici, 2014, Wezel *et al*. 2009; Wezel and Jauneau 2011).

Agroecological practices are agricultural practices aimed at producing enough food by enhancing natural ecological processes and ecosystem services. The term "agroecological practices" emerged in the 1980s in the process of developing agroecology. Agroecology adopts a systems approach to farm management and considers it to be part of its agroecosystem. The idea behind the adoption of agroecological practices is that biological processes and ecological functions can replace chemical or physical inputs, reducing their use and limiting the negative externalities that derive from them, and especially considering the environment. Agroecological practices include the management of soil, water, and other natural resources, as well as the implementation or conservation of defined ecological infrastructure areas in and around agricultural fields and the management of crop plants. AEPs embrace soil fertility management, pest control, biodiversity conservation and agroecosystem integrity (Lampkin *et al*. 2016; Wezel *et al*. 2014) and contribute to food security and livelihoods (HLPE, 2019). This inclusiveness of the concept and its meaning allows us to identify as AEPs, not only agricultural practices but also a great diversity of experiences that have different effects on value chains and food systems. In Kerr *et al*. (2021) we find that “*Agroecological practices aim to optimize ecological processes, environmental and public health and well-being, and minimize social-ecological costs from agriculture such as soil degradation, water contamination, greenhouse gas emissions, exhaustion of non-renewable resources, and inequitable social structures*” (HLPE 2019; Wezel 2016; Wezel *et al*., 2014; Dumont *et al*., 2013).

2.1 NATAE's Common Vision

2.1.1 Agroecological Practices (AEPs) and Agroecological Practices' Combinations in NATAE[3]

In North Africa, agroecology appears to be a relatively undeveloped concept compared to other regions of the world (Boughamourra *et al*., 2022). The agroecological reality of this region, which is still very rural and agricultural, deserves to be understood and characterized for several reasons:

The major pressures and risks that weigh on the region, climatic pressures, environmental pressures and food security issues within an overall context of water stress, invite to reconsider agroecology as a multidimensional solution adapted to a rural development framework.

In literature, agroecology is applied to family-based production systems, often small-scale and based on local knowledge; three elements that are characteristic of the vast majority of farms in the region (Marzin *et al*., 2016).

Numerous projects on the sustainability of agricultural systems or climate change adaptation have been implemented since the 2000s, some of which promote sustainable and adaptive management practices that respond to the principles and elements of agroecology as formulated by FAO (2018) and HLPE (2019).

In general, the few works conducted on farms that can be described as agroecological do not comment on the economic benefits of these practices (Landert *et al.,* 2019). For North Africa, some studies even question the attractiveness of agroecological practices for producers who might consider them as economic constraints, and use, for example, few (chemical) inputs only because they do not have access to more and therefore is not by their own choice (Ameur *et al*, 2020).

Ultimately, it seems more legitimate to speak of "agroecological-inspired practices" in North Africa, rather than "agroecological practices", in reference to historical or local practices that pre-existed the notion of agroecology in the field. Consequently, however, we will retain the term "agroecological practices" and "combination of agroecological practices", considering that they potentially include practices that have never been formally (or scientifically) referenced as agroecological.

2.1.2 The notion of combinations of agroecological practices

Agroecology is described through the 13 principles of the HLPE and the 10 principles of the FAO (Barrios, 2020); each agroecological practice has multiple effects but no practice is a standalone one and the transition makes only sense if more practices are applied in the meantime to activate ecological processes and behavioural changes (theory of change).

A single agroecological practice is not sufficient to qualify a farm as agroecological (even if it is a monoculture). The idea is therefore to consider a diversity of complementary practices, some of which will be inspired by agroecology, applied at the level of farms, agricultural territories, or food value chains, and to propose and to assess how the notion of combination of agroecological practices can allow for an in-depth analysis of the links between these practices for each combination under study. After a first identification of practices will be done on the base of their performance, a modelling phase will follow (WP2) to identify the better potential combination of practices to be proposed to the Field Living Labs communities. It is these combinations of practices, once identified, that will need to be evaluated for their multiple benefits by WP2 and proposed for adoption in the Field Living Labs.

[3] Contribution from the Working document "The notion of AEP (Agroecological Practices) combinations in NATAE, a proposition" by Mélanie Requier, 17 April 2023.

Indeed, in the region, there is no clear reference of agroecological practices as systems of practices or set of interrelated practices at the scales of the production system, the value chain or the territory. The NATAE project hypothesizes that “sets of practices”, which we will refer to as “combinations of practices”, can be identified in each major type of agroecosystem selected for the implementation of the Living Labs.

The project assumes that these combinations of practices inspired by agroecology could be globally beneficial at different scales and according to different evaluation dimensions.

We will therefore speak of multiscale and multidimensional practices and combinations of practices.

2.1.3 Multidimensional evaluation

As mentioned previously, although a single practice does not qualify a farm as agroecological, a single agroecological practice could achieve an impact on several dimensions at the same time such as the environment and the food security of farm households (self-consumption of part of the production resulting from the agroecological practice). This calls for a multidimensional evaluation of the agroecological practices.

The quality of agroecological practices and combinations of practices identified, their qualification in agroecological terms calls for different types or simultaneous dimensions of analysis: for example, agronomic quality (yield) and environmental quality (territory, biodiversity), socio-economic quality (food security, living conditions, economic value) of a combination of practices.

However, a single agroecological practice cannot suffice to induce a behavioural change in people or communities.

The identification and selection of AEPs combinations can thus be based on the multidimensional evaluation of each single practice. This multidimensional assessment can also be adopted, in a later in project phase, for characterizing and evaluating the agroecological performances on farms, value chains or in territories, adopting the criteria explored in this conceptual framework (WP1) and monitored by indicators (T1.1 and T1.2).

Coming back to the notion of combination of practices, we will call a combination of agroecological practices a set of practices that respond to several principles of agroecology in a multidimensional or multiscale logic. The term combination responds to the need to link these practices together considering synergies, integration, and the generation of circular economy processes, etc., and not their juxtaposition, to demonstrate the level of complementarity and to highlight the place of local knowledge or associated skills.

Thus, a combination of an agroecological practices with positive impacts on the ecosystems surrounding the farm and a practice allowing for a better valorisation of the resulting production could be considered as a combination of AEPs (improvement of living and environmental conditions); in this case, the link of the combination connects the production system in its agronomic dimension to the economic value chain. In this example, we note that these two practices are integrated, and that the agroecological qualification is linked to the overall food safety[4] of the production ("One Health" approach).

[4] Sanitary quality of production. Food safety is linked to the aspects relating to the hygiene and wholesomeness of a food. It relate to a set of rules aimed at protecting human health and the right to health.

Behind this example, we suggest that it is the adoption of a combination of complementary practices in reference to the principles of agroecology, and which can be called an agroecological combination, that could allow the sustainability and profitability of the agricultural activity and therefore its durability.

For example, the combination of two agroecological practices on the farm, such as one practice of input reduction and another of production diversification, is a combination of agroecological practices, if the diversification of production allows for the reduction of the use of inputs and is therefore integrated with the reduction of chemical inputs. The idea is to take into account, not the juxtaposition of potentially agroecological practices in the production system as a basis for defining the combination of AE practices, but the integration of several complementary practices between them: either the integration of several technical or management practices at the farm scale, or the integration of at least one agroecological practice at the farm scale with one or more practices linked and identified in the value chains (practices of product valorisation, such as local products, certified products, etc.) as well as at the scale of the territory (organised practices of mutual aid, exchange of knowledge or material, meeting between producers and consumers, etc.).

2.1.4 Territorial approach and Multiscale evaluation

The agroecological transition refers to a societal process of change in agriculture and food production to respond to the realities of global change: in particular, the effects of climate change, water stress, food insecurity and loss of ecosystem services. The expectations placed on agroecology are therefore particularly high and it is important, on one hand, to assess to what extent they are realistic and, on another hand, how they can be met.

The process of AET is context-based, localizable or localized at certain scales, and NATAE hypothesizes that it can be initiated, supported, or accelerated by multiple levels of citizen and socio-economic interactions and exchanges between agroecological actors in the broadest sense. In the NATAE project, the animation approach of the living laboratories is intended to stimulate or support such a multi-actor dynamic (WP4). This animation should allow the construction of a common vision of agroecology in the territories of the living labs, the identification of combinations of agroecological practices adapted to the territories, and the actions necessary to promote their adoption.

Agroecological practices can be applied at the scale of production systems, but also of value chains and food systems, particularly those that are characterised by having one or more producer-consumer links and that could be defined as “territorialized”.

Then agroecology is also and above all interested in the interactions and relationships between these practices, whether they are located at the scale of the farm (plot-farm continuum), or at the scale of its environment (farm-landscape continuum, but also territory-field continuum).

This "potentially agroecological territory" can be more or less vast depending on whether one is looking at it from the point of view of local governance, the associative and cooperative world, value chains, producers or their consumers, and according to the different levels of the AET (Gliessman, 2016).

2.2 Which agroecology for the NATAE project?

Agroecological agriculture is a form of agriculture based on the valorisation of natural and ecological processes. It refers to the scientific fields of systemic agronomy and ecology, as well as to the knowledge coming from the civil society and the farming populations at the scale of the production systems.

With reference to the characteristics of the region and the associated risks, it is possible to prioritize certain objectives to guide the choices of agroecological practices and combinations of agroecological practices that will be adopted in the Living Labs.

These objectives can be gathered in the notion of One Health that has been developing for several years; thus, these agroecological practices should contribute to:

- An improvement in household food security (either through self-consumption, or by increasing income, or by facilitating local access to diversified food products of good nutritional quality, etc.),
- An improvement in the quality of the environment and natural resources, including water availability,
- An improvement in the organisation of local actors (producers, value chains, local authorities) to better explore the agroecological potential of the territory and facilitate its implementation.

Agroecological agriculture is thus translated by practices allowing:

- A zero or lesser use of chemical products,
- An economic management of the natural resources on which agriculture depends,
- Via choices of technical itineraries and natural developments that promote the following multiple benefits: food security, human and environmental health, preservation of agricultural opportunities for future generations.

Thus, agroecology has the potential to mitigate pollution and its associated costs, but it also has the potential for net contributions in terms of common benefits.

2.3 NATAE's Multidimensional Multiscale Methodological Framework

The multiscale multidimensional evaluation framework is the first document of NATAE project aiming to start the whole evaluation process that will take place and continue all along the project actions with the first step being the multidimensional and multiscale assessment of the performance of mapped AEPs.

Within the workflow of NATAE's activities, the evaluation framework will allow the analysis of the performances of AEPs mapped/censed in North Africa countries to identify the ones that could be feasible to replicate in the contexts targeted by the project. The results of this first assessment will be used by WP2 and WP4 to develop and implement their activities.

On the basis of this first assessment, best combination of practices will be elaborated in the course of a modelling phase (WP2), and entry points and tailored strategies will be proposed and agreed with local communities in the Field Living Labs territories (WP4) to further promote the AET of food systems.

By fostering the adoption of science-based, locally-tailored AEPs and combinations for the co-designing of AE strategies in North Africa, this initial phase shall pave the way and induce the process of transformational change.

The interpretations of the term agroecology and the evolution of the definitions that are given from time to time are often linked to the differences that the historical development of agroecology has had in the different countries and regions of the world (Wezel and Jauneau, 2011).

This multidimensional approximation of the term has also been adopted by international organizations, such as the FAO, and by international experts such as the International Panel of

Experts on Sustainable Food Systems (IPES-Food, 2016) and reflects both the great complexity of agroecology itself, and the emphasis placed by the various actors on the functions and role that agriculture has in society and in the food system (Rivera-Ferre, 2012; Ortega-Cerdà and Baumgärtner, 2013).

The at least threefold interpretation of the term agroecology also reflects (Rivera-Ferre, 2012) the components and moments of decision-making processes in agriculture and within the knowledge society: *1)* the moment of evaluation understood as analysis, i.e. the relationship between science and knowledge; *2)* the management or governance of the system with the relationship between institutions, social systems and regulatory legislative aspects; *3)* practices related to production, distribution and markets and related technologies.

The Multidimensional Multiscale Evaluation Framework represent a first moment of the evaluation process to be developed in NATAE, and by supporting the analysis of the performance of agroecological practices it will connect and bridge the “science and knowledge” aspects, with the aspects related to the practices related to production, distribution and markets and related technologies.

Agroecology has actually evolved as a scientific discipline since the 1970s thanks to the work of many scientists (Bellon *et al*. 2016). Being a scientific discipline, it includes the necessary knowledge of a series of theoretical and applied knowledge. Theoretical knowledge has a more general validity, which does not depend on the context, whereas the more applicative knowledge, which derives from experiments or AEPs, is linked to the contexts, and their performances depend on the places in which one operates; for example, the principles are valid in whatever context one operates. The functioning and the effects deriving from the application of the principles and individual practices, as well as the quantitative and measurable aspects that describe the effectiveness of agroecological actions and practices, can vary depending on the different environmental contexts, above all in consideration of the conditions of departure and of the resources at our disposal (resource status), therefore we say that they are dependent on the context, i.e., context specific.

The credentials of agroecology as a scientific discipline, have been measured against the norms of science and defined by Robert King Merton (1973) as communitarianism, universality, disinterestedness, originality and doubt.
It is concluded that agroecology satisfies many of these norms, and where it differs, it does so in a way that perhaps anticipates the way and direction in which the social position of science is changing. All sciences evolve in their content and definitions, and this evolution should not be considered as a problem but a valuable feature.
There are multiple definitions and meanings that refer to different objects of study, concepts, levels of scale, and research methods that define agroecology. While this can be seen as richness, our experience reveals that this rich diversity is also a source of misunderstanding therefore the question "Is agroecology a science?" persists. Dalgaard *et al*. (2003) provide convincing evidence that it is a science, but this is only true when applied to their specific definition of agroecology in relation to production practices and systems. It would be wrong to define agroecology as a science in all its three main meanings.

Despite the well-documented positive impacts of agroecology, in some contexts the visible impact or performance of AEPs can be hidden by many context-specific obstacles of different nature requiring solutions from different fields of competence (Beudou *et al*., 2017; El Bilali, 2019). There is no single way to apply agroecology and AET should be designed in an inclusive manner that embodies the local contexts and constraints (Barrios *et al*. 2020). Such technical, political, social, cultural, economic obstacles can hide the effects of ongoing AET process, therefore a more wide and inclusive definition of AEPs will be adopted by NATAE project in order to map and value existing “seeds” of practices that could foster a transition to a more sustainable food system in North Africa and propose for wider adoption. These “seeds” or practices should anyway contribute to the inclusion of the 13 consolidated AE principles (Wezel *at al*. 2020) viz. recycling, biodiversity, land and natural resource governance,

input reduction, soil health, animal health, connectivity, synergy, fairness, participation, co-creation of knowledge, social values and diets, and economic diversification.

2.3.1 Building on previous experiences and connection with other methodological frameworks

In the past years, various multidimensional evaluation methods for AEPs have been developed in relation to AE and AET (Darmaun *et al*., 2023). Each of them aims to assess the benefits and limits of AETs in different contexts and promote sustainable development[5] by meeting own specific different and relevant objectives (Mottet *et al*., 2020).

The various evaluation frameworks that were developed over the years have pursued several objectives simultaneously. Those taken into consideration by the above-mentioned report were specifically developed starting from the need to favour the development of agroecology in identifying ruptures and levers of the agroecological transition process.

All the methodologies try to interpret what is happening at a territorial level on the basis of contextualized data collected at the farm level. They use and offer tools to evaluate the performance of agricultural practices, providing indicators to be elaborated on the basis of the available data collected. Most of them measure the level of agroecology according to a main frame and multiple objectives (Mottet et al., 2020, Levrad et al., 2023), some others evaluate the differences between agroecological and non-agroecological farms (Fleury et al., 2021; Landert et al., 2019)

In addition, all frameworks also aim to influence public policies and decision-makers, because there is still a certain degree of scepticism about the relevance and feasibility of agroecology as a response to the challenges and problems that put pressure on agricultural production systems today (Levard *et al.* 2019). Therefore, pursuing these objectives, all the methodological frameworks considered and reported have contributed to providing analyses and methodologies, and to proposing sets of consolidated and often common indicators.

Some of these frameworks were tested and adopted also in North Africa. Important advancements were achieved and may allow to address a change in the entire food system, but some dimensions connected to human and environmental health particularly important for NATAE contexts are still overlocked (Table 1).

[5] See report of T1.1 “State of the art of multidimensional performance evaluation framework”. Marion Comptour (CARI) https://cloud.natae-agroecology.eu/index.php/s/NRa7HGfYaLN9KBm

Table 1: Synthesis of the comparative analysis on the in State of the art of multidimensional performance evaluation framework

Methodological framework	ARCHITECTURE			FOOD SYSTEM DIMENSION	HUMAN & ENVIRONMENTAL HEALTH DIMENSION	GENDER & YOUTH DIMENSION
	Description	+	-			
AVACLIM	**4 dimensions** • Tech. and economic performances • Quality of life and well being • Agroecosystem health • Resilience **72 indicators**	Holistic, multidimensional Adaptable Many tools and an application	Difficult to compare different initiatives Time consuming, difficult to implement	VC dimension covered by some indicators: participation in knowledge exchange networks; share of direct sales or short circuits in the turnover …)	3 indicators for pesticides uses 18 indicators for "biodiversity"	No specific indicator addressing the gender dimension
Handbook GTAE	**2 dimensions** • Socio-economic • Agro-environmental **104 indicators**	Adaptable to different situations Evaluation of both the impacts and the condition of development of AE Ambition to be easily usable by development actors Step by step approach and tools Requires minimum skills	In-depth farm case studies are quite time-consuming	VC and FS dimension covered by some indicators : food security, empowerment of women, appeal of agriculture for youth…	4 indicators for pesticides uses 10 indicators covering the biodiversity' criteria Effect "farm resilience and adaptation to climate change'	Several indicators related to empowerment of women in the older version Data collected and analysed by gender when possible
TAPE	**5 dimensions** • Governance • Economy • Health & nutrition • Society & culture • Environment & climate change 10 core criteria **60 indicators**	Widely applicable Limited number of core criteria with flexible indicators Easy to implement in a relative short time	Less accurate and less context-specific than others methods	Include indicators on health and nutrition and society and culture	Include indictors related to exposure of pesticides Include indicators related to agricultural biodiversity	Include indicators related to women's empowerment Data are disaggregated by gender when possible.

Source: Presentation by Marion Comptour, CARI – NATAE 1st consortium meeting, Bari 26-28 April 2023.

2.3.2 Connections with other conceptual frameworks

The analysis of the pre-existing methodological frameworks made it possible to identify some potential areas for improvement that the present framework intends to explore. The methodological framework of NATAE aims to improve the connection between the performance of the AEPs and the components identified by the FAO (Barrios, 2020) and the principles of agroecology identified by the HLPE (2019). At the moment the methodological framework does not have the objective of evaluating the level of ecological transition reached by farms, contexts and communities. Improving this aspect would support the modelling phase in WP2, and would allow to better operationalize agroecological practices and evaluate the potential effect of the combinations, thus improving the connection with the levels of ecological transition identified by Gliessman (2016).

The methodological framework also aims, where possible, to identify an eventual contribution of the AEPs to the Sustainable Development Goals (SDGs). This aspect is partly present in GTAE 2019 (Levrard *et al*.,2019) and in the TAPE method (Mottet *et al*., 2020).

An important aspect is to insert a connection between the performance of the AEPs and the provision of ecosystem services that would deserve particular attention in the frame of agroecology, also in relation to the connection of AEPs with ecosystem services attributable to an improvement in living conditions (well-being, quality of life, food security).

Another important aspect that will be considered is the correlation of AEPs and their contribution and congruence and convergence of NATAE's framework with trendlines related to the One Health approach.

The NATAE's methodological framework builds on those previous methodological frameworks and on their experiences to develop and on its own tool with the specific objective of making an evaluation

of performances of AEPs tailored for North African Countries, and aiming at overcoming problems that may raise in the replicating the AEP elsewhere and could hinder the possibility to achieve a proper agroecological transition in such contexts.

Keeping in mind the previous experiences, the aspects that characterise AE (meant as scientific discipline) and the AEPs and the purpose of the methodological framework, it is of outstanding importance to be able to accommodate all the conceptual and practical facets that will express the adaptation of the evaluation of the methodological frameworks to the reference contexts in which we perform our actions.

The multidimensional assessment of the performance of AEPs and of their combinations is meant to evaluate their potential and actual contribution to agroecological transitions of North African countries, assessing the performance of AEPs or AEPs combinations to several dimensions and across multiple scale of analysis.

For the purpose of our project with the term "dimensions" we refer to 5 domains: *i)* environment and climate change; *ii)* health and nutrition; *iii)* society and culture; *iv)* economy; and *v)* governance.

The Methodological Framework will address these 5 domains identifying the impact of AEPs in relation to the five main dimensions including the economic, social and environmental dimensions are reported as pillars of Sustainability, considering health and nutrition dimension and governance dimensions.

Sustainability is usually seen as a guide for economic and social policymaking in equilibrium with ecological conditions and is one of the most relevant concepts at the basis of agroecological transition.

More than two decades after the World Commission on Environment and Development (WCED) defined 'sustainable development' and put the concept of sustainability on the global agenda, the 2030 Agenda for Sustainable Development came into force in January 2016 as the central United Nations (UN) platform for achieving 'integrated and indivisible' goals and targets across the three characteristic dimensions of sustainable development: the social, environmental and economic. For a long time since its setting, the sustainable development agenda tried to operationalize the integration of economic and social development with environmental sustainability; in this effort more dimensions were time to time added (Purvis *et al*. 2018, Najjar, 2022) governance sustainability was considered another pillar (Bogliotti and Spangenberg, 2006) and nutrition among the sustainability dimensions (El Bilali *et al*. 2019).

In addition, other sub-dimensions will be considered in order to capture the effects of practices. For the social dimension the sub dimensions of gender, youth, and vulnerable categories will be considered. In relation to environmental dimension other subdimensions will allow to understand performances and impacts on air, water, soil health and biodiversity intended as component of the natural capital.

In September 2015, the United Nations (UN) General Assembly adopted 17 Sustainable Development Goals (SDGs) as an integral part of the 2030 Agenda for Sustainable Development. These 17 goals were to build upon and broaden the scope of the earlier Millennium Development Goals[6] (MDGs),

[6] The Twelve Manhattan Principles are the following: 1. Recognize the essential link between human, domestic animal and wildlife health and the threat disease poses to people, their food supplies and economies, and the biodiversity essential to maintaining the healthy environments and functioning ecosystems we all require. 2. Recognize that decisions regarding land and water use have real implications for health. Alterations in the resilience of ecosystems and shifts in patterns of disease emergence and spread manifest themselves when we fail to recognize this relationship. 3. Include wildlife health science as an essential component of global disease prevention, surveillance, monitoring, control and mitigation. 4. Recognize that human health programs can greatly contribute to conservation efforts. 5. Devise adaptive, holistic and forward-looking approaches to the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases that take the complex interconnections among species into full account.6. Seek opportunities to fully integrate biodiversity conservation perspectives and human needs (including those related to domestic animal health) when developing solutions to infectious disease threats. 7. Reduce the demand for and better regulate the international live wildlife and bushmeat trade not only to protect

which expired at the end of that year, but above all, mark the most ambitious effort yet to be realized: to place goal setting at the center of global policy and governance.

To complete the analysis of the performances, the framework related to the impact on ecosystem services will be also included as the provision of clean water or crop pollination, are often undervalued aspects of natural capital that should be incorporated also into economic discussions of sustainability. Besides the obvious connection with environmental dimension this kind of framework allows to have an insight on cultural aspects and human well-being that well relate to the approach of One Health trough the twelve Manhattan Principles of "*One World, One Health*".

Building on such background, NATAE will explore the performance of AEPs in relation to the previously mentioned "dimensions" and frameworks.

The 13 consolidated AE principles (Wezel *at al*. 2020) viz. recycling, biodiversity, land and natural resource governance, input reduction, soil health, animal health, connectivity, synergy, fairness, participation, co-creation of knowledge, social values and diets, and economic diversification, will support the analysis of performances at different scale (Figure 1).

Principle	Scale of application	Correspondence to FAO elements
1. Recycling. Preferentially use local renewable resources and close as far as possible resource cycles of nutrients and biomass.	FI, FA	Recycling
2. Input reduction. Reduce or eliminate dependency on purchased inputs and increase self-sufficiency.	FA, FS	Efficiency
3. Soil health. Secure and enhance soil health and functioning for improved plant growth, particularly by managing organic matter and enhancing soil biological activity.	FI	Reflected in diversity, synergies and resilience
4. Animal health. Ensure animal health and welfare.	FI, FA	Reflected in resilience
5. Biodiversity. Maintain and enhance diversity of species, functional diversity and genetic resources and thereby maintain overall agroecosystem biodiversity in time and space at field, farm and landscape scales.	FI, FA	Part of diversity
6. Synergy. Enhance positive ecological interaction, synergy, integration and complementarity amongst the elements of agroecosystems (animals, crops, trees, soil and water).	FI, FA	Synergies
7. Economic diversification. Diversify on-farm incomes by ensuring that small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers.	FA, FS	Parts of diversity as well as circular and solidarity economy
8. Co-creation of knowledge. Enhance co-creation and horizontal sharing of knowledge including local and scientific innovation, especially through farmer-to-farmer exchange.	FA, FS	Co-creation and sharing of knowledge
9. Social values and diets. Build food systems based on the culture, identity, tradition, social and gender equity of local communities that provide healthy, diversified, seasonally and culturally appropriate diets	FA, FS	Human and social values Culture and food traditions
10. Fairness. Support dignified and robust livelihoods for all actors engaged in food systems, especially small-scale food producers, based on fair trade, fair employment and fair treatment of intellectual property rights.	FA, FS	Part of human and social values
11. Connectivity. Ensure proximity and confidence between producers and consumers through promotion of fair and short distribution networks and by re-embedding food systems into local economies.	FA	Part of circular and solidarity economy
12. Land and natural resource governance. Strengthen institutional arrangements to improve, including the recognition and support of family farmers, smallholders and peasant food producers as sustainable managers of natural and genetic resources.	FA, FS	Responsible governance
13. Participation. Encourage social organisation and greater participation in decision-making by food producers and consumers to support decentralised governance and local adaptive management of agricultural and food systems.	FS	Part of human and social values

Figure 1 – Consolidated set of 13 agroecological principles, their scale of application and correspondence to FAO elements of Agroecology. FI, field; FA, farm/agroecosystem; FS, food system. *Source: Wezel et al., 2020*

wildlife populations but to lessen the risks of disease movement, cross-species transmission, and the development of novel pathogen-host relationships. The costs of this worldwide trade in terms of impacts on public health, agriculture and conservation are enormous, and the global community must address this trade as the real threat it is to global socioeconomic security. 8. Restrict the mass culling of free-ranging wildlife species for disease control to situations where there is a multidisciplinary, international scientific consensus that a wildlife population poses an urgent, significant threat to human health, food security, or wildlife health more broadly. 9. Increase investment in the global human and animal health infrastructure commensurate with the serious nature of emerging and resurging disease threats to people, domestic animals and wildlife. Enhanced capacity for global human and animal health surveillance and for clear, timely information-sharing (that takes language barriers into account) can only help improve coordination of responses among governmental and nongovernmental agencies, public and animal health institutions, vaccine / pharmaceutical manufacturers, and other stakeholders. 10. Form collaborative relationships among governments, local people, and the private and public (i.e.- non-profit) sectors to meet the challenges of global health and biodiversity conservation. 11. Provide adequate resources and support for global wildlife health surveillance networks that exchange disease information with the public health and agricultural animal health communities as part of early warning systems for the emergence and resurgence of disease threats. 12. Invest in educating and raising awareness among the world's people and in influencing the policy process to increase recognition that we must better understand the relationships between health and ecosystem integrity to succeed in improving prospects for a healthier planet.

NATAE project will act evaluating the performance of AEPs and identifying AEPs combination in relation to five scales of intervention:

PHYSICAL SCALE

1. Plot level
2. Farm level
3. Landscape level

ECONOMIC/SOCIAL SCALE

4. Value chain level
5. Food system level.

This would allow to capture the potential and actual contribution of each initiative, AEP or combination of practices to the AE transitions and to adapt each AEP or combination of practices to the specific contexts identified for their replicability.

The methodological framework will build on previous experiences to provide a flexible tool with a congruous set of indicators through which to analyse a diversity of AEPs.

Apart from mobilizing previously mentioned agroecology assessment methodologies, it appears important to refer to main international perspectives in the field of environment and human development such as the Ecosystems services, the Sustainable Development Goals and the One Health Approach that are briefly presented in the next page.

Ecosystem Service (s) - The well-being of human society depends on a wide range of the benefits and services derived from the ecosystems functioning stock called Ecosystem Services (ESs) (Daba and Dejene, 2018). These benefits flowing from ecosystems / natural capital could be either directly or indirectly enjoyed, consumed, or used by humans to maintain or progress human well-fare (Boyd and Banzhaf, 2007; Fisher, 2009; Maseyk *et al*., 2017). Agriculture and Ecosystem Services are strongly connected because agroecosystems produce ESs such as soil retention, food production, and in the meantime, they receive and use beneficial ESs from other ecosystems e.g., pollination service. The growing of human population and the increasing of food demand made agriculture a major driver of land use change leading to environmental damage and degradation of several ESs (Costanza *et al.,* 1997; Daily *et al.,* 1997; Haines-Young, 2009). Agriculture impact on ecosystems and on their ability to provide ESs in two main ways, by changing the landscape and by impacting natural resources and environment with agricultural practices. While the impact of agriculture practices is very much context dependent and can greatly vary, the modification in terms of land use can be more easily detected and measured. Several studies all over the world demonstrated that the economic value of the direct and indirect benefits of ES can be substantial (Costanza *et al.,* 1997; Daily *et al.,* 1997; Sandhu *et al.,* 2008), therefore, together with the growing awareness of the importance of the utilization of these services, in recent years scientific community and policy makers recognized the need to incorporate economic evaluation of ESs into decision-making processes through the determination of their values (Costanza *et al.,* 1997; Costanza *et al*., 2014; Daily *et al.,* 1997; De Groot *et al.,* 2010; Sandhu *et al.,* 2010).

One Health Approach - In 2004, the Wildlife Conservation Society held a conference at Rockefeller University in New York called "One World, One Health", during the conference the twelve Manhattan Principles were created to describe a unified approach to the prevention of epidemic diseases[7] (Gibbs, 2014). They emphasize links between humans, animals, and the environment, the importance to understand disease dynamics and the need for interdisciplinary approaches to prevention, education, investment, and policy development. The approach sees public health as no longer in purely human terms[8] (Rabinowitz *et al*., 2013) due to a shared environment and highly conserved physiology, animals and humans suffer from the same zoonotic diseases, and can also be treated by either structurally related or identical drugs. The approach started to focus on devoting special care in avoiding unnecessary or over-treatment of zoonotic diseases, (Scott *et a*l., 2020). The objectives of "One Health" are supported by several organizations throughout the world that have published a guide to support the various countries in the fight against these diseases according to the One Health approach. Recently, the WHO drafted a Manifesto with 6 prescriptions for a 'healthy and green' post-Covid-19 recovery: 1) conserve nature; 2) ensure access to clean water; 3) ensure a swift and healthy energy transition; 4) promote healthy and sustainable food systems; 5) build healthy and liveable cities; 7) reset incentives for fossil fuels. These recommendations are perfectly in line with the sustainable development objectives of the 2030 Agenda.

Sustainable Development Goals (SDGs) – The Sustainable Development Goals [9]or Global Goals are seventeen interlinked objectives designed to serve as a "*shared blueprint for peace and prosperity for people and the planet, now and into the future*". SDGs were formally articulated and adopted in a United Nature Global Assembly resolution called the 2030 Agenda, known as Agenda 2030[10]. They emphasize the interconnected environmental, social and economic aspects of sustainable development by putting sustainability at their centre (Schleicher *et al*., 2018). There are cross-cutting issues and synergies between the different goals. On 6 July 2017, the SDGs were made more actionable by a resolution that identifies specific targets for each goal and provides indicators[11] to measure progress. AE strategies have thought to be optimal pathways to reach concomitantly several SDGs[12], in particular SDG1-no poverty, SDG2-zero hunger, SDG3-good health and well-being, SDGI0-reduced inequalities, SDG13-climate action and SDG15-life on land. Integrating health and well-being across the SDGs are both preconditions and outcomes of sustainable development and this connect to One Health Approach.

[7] http://www.oneworldonehealth.org/sept2004/owoh_sept04.html

[8] https://library.buffalo.edu/PDFs/onehealth.pdf

[9] The SDGs are: 1.no poverty; 2.zero hunger; 3.good health and well-being; 4.quality education; 5.gender equality; 6.clean water and sanitation; 7.affordable and clean energy; 8.decent work and economic growth; 9.industry, innovation and infrastructure; 10.reduced inequalities; 11.sustainable cities and communities; 12.responsible consumption and production; 13.climate action; 14.life below water; 15.life on land; 16.peace, justice, and strong institutions; and 17.partnerships for the goals.

[10] United Nations (2015) Resolution adopted by the General Assembly on 25 September 2015, Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1 Archived).

[11] United Nations (2017) Resolution adopted by the General Assembly on 6 July 2017, Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313 Archived).

[12] https://www.fao.org/agroecology/overview/agroecology-and-the-sustainable-development-goals/en/

2.3.3 Results of the co-creation process

The multidimensional multiscale AEPs evaluation framework is made of three different parts interconnected with each other:

1. A conceptual framework including some conceptual aspects on agroecology and agroecological practices that constitute NATAE's common vision.
2. A set of indicators
3. A glossary

The conceptual framework builds on the common understanding of the project requirements. It is shaped to include concepts and definitions underlying all project actions, the selection criteria of the AEPs and the basic settings that will motivate our evaluations.

The joint evaluation framework is meant as a living document to be updated and amended all through the NATAE project. The final result will contribute to the construction of the NATAE design identity. As such, the whole Consortium was involved in a co-creation process for its development.

The process allowed to share and agree on relevant questions that go beyond the project prescriptions and the function of the assessment of the performances that are finalised to the workflow of the project tasks. It started with a process of aligning views of partners by sharing, discussing and commenting definitions and comments. The first outcome expressed the common background and the expectations of the consortium about the methodological framework.

2.3.3.1 What is the main purpose or objective for evaluating the performances of agroecological practices?

Various multidimensional evaluation methods for AEPs have been developed in the past years. Those frameworks are the ones on which NATAE builds on to develop its own tool as the project needs its own framework to adapt the evaluation performances of the AEPs and their combinations to North African Countries.

The objective of the evaluation framework is to capture the performances of AEPs trough different dimensions and different scales, with the aim of measuring the effects and impacts of agroecological practices in environmental, agronomic, economic, and social domains to accompany/support the farmers in identifying the most promising AEPs and combinations tailored for the contexts of North African countries. This is considered of utmost importance for all countries participating in the project. This would in turn allow to influence public policy and decisions-makers and will facilitate to achieve a better policy environment for agroecology and agroecological transition for future in medium term.

Moreover, the evaluation of the performances of AEPs and of AEPs' combinations will allow identifying breaks and levers of agroecological transition process opening the possibility to foster the development of AE in those territories.

Developing a good diagnostic tool[13] together with the dissemination of agroecological practices will promote local expertise, allowing to match local knowledge with the new insight provided by NATAE.

It would be important for farmers access to the output of the evaluation and also to be able to perform their own evaluation of the AEPs at household level because socio-economic assets and environmental conditions are very variable also within the same region.

[13] The methodological framework and the database of indicators together perform a "diagnosis" of the performances of AEP, in that sense they are also a diagnostic tool.

2.3.3.2 *Who should be or will be the end-users of NATAE AEPs performances evaluation framework[14]?*

Keeping in mind that the tool should allow NATAE partners to identify the AEPs on the base of the performances and, in a subsequent moment within project development, it should allow assessing the performances of AEPs' combinations, but it should also be adopted by experts, national and international organisations working on AE pathways and transitions, by people working in living labs and possibly by farmers.

Due to the interdisciplinarity of NATAE project, those different audiences may use the evaluation framework in different ways, as soon as they share the common conceptual vision.

In some contexts, farmers might be illiterate, this would hamper them from adopting and apply the tool independently, but can be supported by other local actors (advisory and extension services …), as long as the output of the tools will include information valuable for them and easily sharable.

The ambition of NATAE is that also students and researchers outside the consortium, as well as experts belonging to future research projects could adopt the methodological framework and the dataset.

Also, private companies interested in the promotion of AEPs should be able to use the framework and an interesting point was raised about the possibility for policy makers to adopt the tools and share the NATAE's vision. Because as a transdisciplinary project the information should be useful for multiple stakeholders and this would contribute achieving transdisciplinary outcomes.

2.3.3.3 *How the multiple dimensions[15] of the AEPs can be embraced by the NATAE AEPs performances evaluation framework?*

The performance of each AEP or AEPs combinations will be analysed and evaluated by considering the impacts and achieved benefits on the economic, social, governance and environmental dimensions.

It is necessary to consider a diversity of dimensions and subdimensions that could include and consider equity, by reducing inequalities through particular attention to local communities and gender issues.

The tool should consider synergies, trade-offs, bad performances of AEP in/between dimensions as it is important to assess all dimensions - holistic like agroecology- and show trade-off and synergies. Knowing that it will not always be possible to link a practice to each dimension, the tool should allow to clarify potential trade-off/ synergies between the dimensions, to enrich knowledge of what is AE and what can AE perform or cannot perform.

Attention should be paid on how farmers evaluate the performance of their own / applied practices aiming at enriching the most common evaluation framework with farmers' criteria.

[14] It is important to underline that we only refer to the users of the evaluation framework, the issue do not refer to the end users of the result of the assessment.

[15] The considered dimensions are: environmental dimension, social dimension, economic dimension and governance dimension, reflecting dimensions of sustainable development: economic development (including ending extreme poverty), social inclusion, environmental sustainability, and good governance (including peace and security) (The future we want: outcome of the Conference on Sustainable Development, Rio de Janeiro, Brazil, 20-22 June 2012).

2.3.3.4 How the multiple scale[16] of the AEPs can be embraced by the NATAE AEPs performances evaluation framework?

The performances of each AEP or AEPs combination will be analysed/evaluated based on impacts on plot, farm, value chain and territorial scale, to consider synergies and trade-offs between scales, and/or bad performances of the AEPs in a specific scale. In this way we will improve our knowledge and understanding of what AE can be or can do in a realistic way. The multiscale approach of the assessment is relevant to capture the potential impact on value chains and on territories.

The analysis of performances is one component of the evaluation process that is going to be carried out by NATAE about AEPs and their combinations because if we are going to capture the impacts of national level and on multiple value chains (food system) then economy-wide analysis are required, to capture workflow, cropping system and plot system changes. As such a partial equilibrium or general equilibrium (CGE) could be adopted as modelling approach during the NATAE development.

2.3.3.5 How complex our framework should be to evaluate the AEPs performances?

The methodological framework should be flexible enough to meet a degree of precision coherent with the project outputs and needs as the diversity of partners (interdisciplinarity) and territories along with the diversity of AEPs need flexible framework.

It should be simple enough to use since it should be understandable and easily applicable by all partners of the project, though complex enough to allow a detailed and effective diagnosis.

Results need to be understandable, but the framework needs to be detailed. Results should be easily sharable and including what is relevant for any stakeholder. They should also be transparent to the stakeholders and the public (science communication) and it is important the style and less Jargons is recommended in communicating.

The framework should also take in consideration that the complexity and the effectiveness and detail of results will also depend on data availability, it should be as complex and detailed as the data available allows. Data availability is really a key aspect for running the assessment and not just for us as consortium but for the end-user who will implement the method.

2.3.3.6 How the diversity of approaches, definitions, and reference frame of agroecology will be fitted in the NATAE AEPs performances evaluation framework?

The diversity of approaches, definitions, and reference frame of agroecology are included in the NATAE AEPs performances evaluation framework by the co-creation process[17].

The approach of the consortium is going to be inclusive and gather all the opinions because the project wants to stick with the stakeholders and the diversity of interests of the different partners should be considered for each territory.

To do so, special importance would be given to undocumented, *de-facto*, because AEPs that are consciously or unconsciously practical by farmers (farm to fork, home production for home consumption). Therefore, the assessment of AEPs performance is going to be considered a "living" and adaptive process, that combines in time and in space with feedback loops and it should avoid being locked into an ex-ante or ex post normative framework.

The contribution of AEPs to SDGs should be seriously considered and effort will be made in early future to integrate our common vision and tools with other existing tools dealing with agroecology and

[16] The scales mentioned by the NATAE project proposal are: plot, farm, value chain and territorial scale.

[17] The process of co-creation so far includes the three workshops of task 1.2 of NATAE held on 26th April, 26th May and 15th June and also the possibility that all people belonging to NATAE Consortium had to modify the Glossary, the Methodological Framework and the Database of indicators on the NATAE CLOUD.

agroecological transition for example with One CGIAR - Agroecology initiative is working for identifying the different indicators for different innovation.

The theoretical and specific approach of the project to the evaluation of the performance of the practices will be developed all along the project implementation and it will be finalized at the end of the project. It will flow into the identity approach of the project. Open regular discussions on the most relevant approach and definitions and about most important points will go on during the implementation of the project.

The approach will reflect the agroecological principles of the HLPE (High-Level Panel of Experts) It will build on approaches already developed by consortium members or other stakeholders and communities involved or engaged.

2.3.4 Connection with other work packages in NATAE

The fruitful discussion about the multiscale multidimensional framework for the assessment of performances of AEPs and their combinations brought about the question of which are the criteria needed to identify performances and what could be an acceptable level of performance of AEPs or of their combinations.

Even if the performance of an AEP doesn't improve all four dimensions, it could be acceptable if it doesn’t have a reduced performance in any of them, when compared with the current practices. This leads to the need to integrate "*bad*" performances in certain areas by introducing a mechanism of trade-off and arbitration.

A warning was made about, being aware of "no regret" measure. Reports should be positively framed and highlight / take into consideration the incremented (stepwise) nature of the AE transition.

It is important to have an evaluation of AEPs under a “cost & waste” saving mechanism to avoid the risk of jeopardise farmers income.

The methodological framework aims to provide an assessment and some simple criteria to include “best” performing AEPs among the ones that could be adopted. The final choices about practices to be adopted will be performed by local communities in the LL during the participatory processes.

The preliminary work on the single AEPs will support WP2 in proposing AEPs combinations able to achieve good performances in all the four dimensions. The contexts and cases will be taken into consideration to fit the specificities of each LL context through the joint efforts of WP2 and WP4.

Chapter 3

Database of indicators

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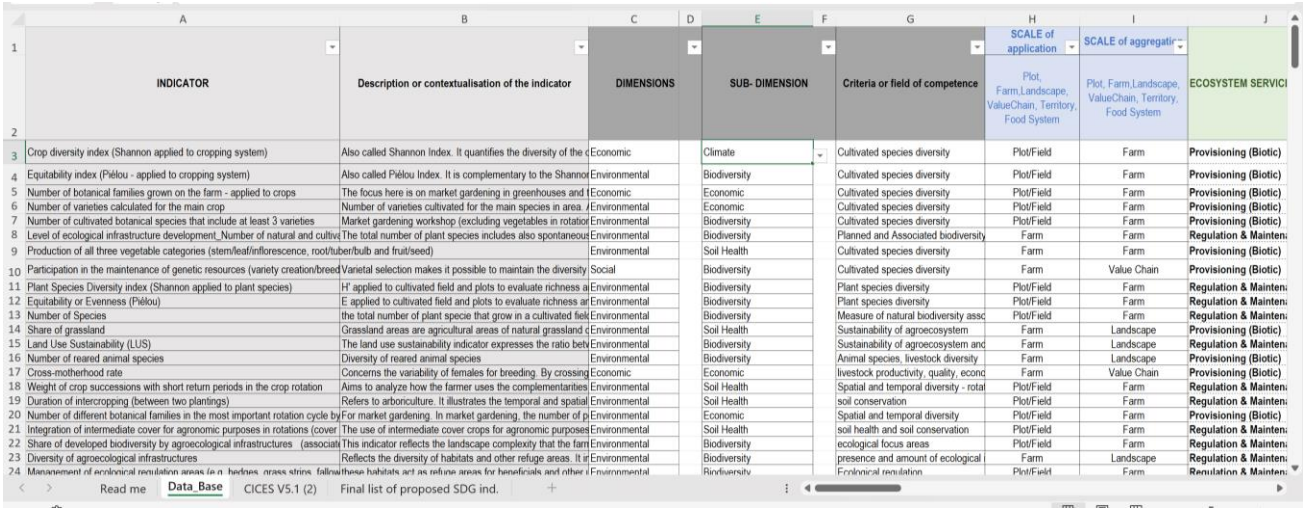
Chapter 3 - Database of Indicators

The objective of Task 1.2 (WP1) is to design a multidimensional, multiscale (from plot and farm system levels to the wider value chain and food system) evaluation framework of AEP strategies in North Africa.

The developed database includes a list of indicators and corresponding short description that builds on the deliverable of Task 1.1 carried out by CARI within the same WP.

It is the result of a co-construction process that took in consideration the concerns and comments expressed by partners and engaged people and reported the set of indicators in an xls sheet connecting them to the 5 dimensions relevant to NATAE, sub-dimensions, and other related criteria.

The table includes 199 indicators and indexes, they can be chosen and selected by different entry points.



	A	B	C	D	E	F	G	H	I	J
1								SCALE of application	SCALE of aggregatic	
2	INDICATOR	Description or contextualisation of the indicator	DIMENSIONS		SUB- DIMENSION		Criteria or field of competence	Plot, Farm,Landscape, ValueChain, Territory, Food System	Plot, Farm,Landscape, ValueChain, Territory, Food System	ECOSYSTEM SERVICI
3	Crop diversity index (Shannon applied to cropping system)	Also called Shannon Index. It quantifies the diversity of the c	Economic		Climate		Cultivated species diversity	Plot/Field	Farm	Provisioning (Biotic)
4	Equitability index (Piélou - applied to cropping system)	Also called Piélou Index. It is complementary to the Shannor	Environmental		Biodiversity		Cultivated species diversity	Plot/Field	Farm	Provisioning (Biotic)
5	Number of botanical families grown on the farm - applied to crops	The focus here is on market gardening in greenhouses and t	Economic		Economic		Cultivated species diversity	Plot/Field	Farm	Provisioning (Biotic)
6	Number of varieties calculated for the main crop	Number of varieties cultivated for the main species in area. /	Environmental		Economic		Cultivated species diversity	Plot/Field	Farm	Provisioning (Biotic)
7	Number of cultivated botanical species that include at least 3 varieties	Market gardening workshop (excluding vegetables in rotatior	Environmental		Biodiversity		Cultivated species diversity	Plot/Field	Farm	Provisioning (Biotic)
8	Level of ecological infrastructure development_Number of natural and cultiv	The total number of plant species includes also spontaneous	Environmental		Biodiversity		Planned and Associated biodiversity	Farm	Farm	Regulation & Mainten
9	Production of all three vegetable categories (stem/leaf/inflorescence, root/tuber/bulb and fruit/seed)		Environmental		Soil Health		Cultivated species diversity	Farm	Farm	Provisioning (Biotic)
10	Participation in the maintenance of genetic resources (variety creation/breed	Varietal selection makes it possible to maintain the diversity	Social		Biodiversity		Cultivated species diversity	Farm	Value Chain	Provisioning (Biotic)
11	Plant Species Diversity index (Shannon applied to plant species)	H' applied to cultivated field and plots to evaluate richness a	Environmental		Biodiversity		Plant species diversity	Plot/Field	Farm	Regulation & Mainten
12	Equitability or Evenness (Piélou)	E applied to cultivated field and plots to evaluate richness ar	Environmental		Biodiversity		Plant species diversity	Plot/Field	Farm	Regulation & Mainten
13	Number of Species	the total number of plant specie that grow in a cultivated fiel	Environmental		Biodiversity		Measure of natural biodiversity assc	Plot/Field	Farm	Regulation & Mainten
14	Share of grassland	Grassland areas are agricultural areas of natural grassland c	Environmental		Soil Health		Sustainability of agroecosystem	Farm	Landscape	Provisioning (Biotic)
15	Land Use Sustainability (LUS)	The land use sustainability indicator expresses the ratio betv	Environmental		Biodiversity		Sustainability of agroecosystem and	Farm	Landscape	Regulation & Mainten
16	Number of reared animal species	Diversity of reared animal species	Environmental		Biodiversity		Animal species, livestock diversity	Farm	Landscape	Provisioning (Biotic)
17	Cross-motherhood rate	Concerns the variability of females for breeding. By crossing	Economic		Economic		livestock productivity, quality, econc	Farm	Value Chain	Provisioning (Biotic)
18	Weight of crop successions with short return periods in the crop rotation	Aims to analyze how the farmer uses the complementarities	Environmental		Soil Health		Spatial and temporal diversity - rotat	Plot/Field	Farm	Regulation & Mainten
19	Duration of intercropping (between two plantings)	Refers to arboriculture. It illustrates the temporal and spatial	Environmental		Soil Health		soil conservation	Plot/Field	Farm	Regulation & Mainten
20	Number of different botanical families in the most important rotation cycle by	For market gardening. In market gardening, the number of pl	Environmental		Economic		Spatial and temporal diversity	Plot/Field	Farm	Provisioning (Biotic)
21	Integration of intermediate cover for agronomic purposes in rotations (cover	The use of intermediate cover crops for agronomic purposes	Environmental		Soil Health		soil health and soil conservation	Plot/Field	Farm	Regulation & Mainten
22	Share of developed biodiversity by agroecological infrastructures (associat	This indicator reflects the landscape complexity that the farm	Environmental		Biodiversity		ecological focus areas	Plot/Field	Farm	Regulation & Mainten
23	Diversity of agroecological infrastructures	Reflects the diversity of habitats and other refuge areas. It ir	Environmental		Biodiversity		presence and amount of ecological	Farm	Landscape	Regulation & Mainten
24	Management of ecological regulation areas (e.g. hedges, grass strips, follow	these habitats act as refuge areas for beneficials and other (	Environmental		Biodiversity		Ecological regulation	Plot/Field	Farm	Regulation & Mainten

Read me | Data_Base | CICES V5.1 (2) | Final list of proposed SDG ind.

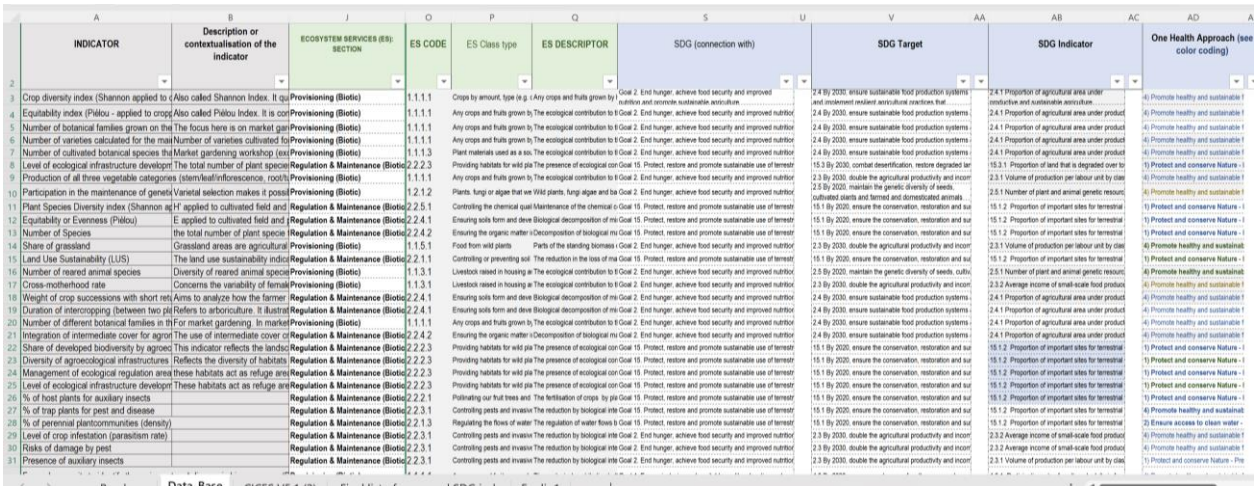
Figure 2: Print screen for the Database sheet showing the possibility to select Dimension, Sub-dimension and Scale for each indicator.

One entry point can be the scale or the main scale at which the AEP has been adopted, or the scale at which its performance can be detected.

Another entry point could be the dimension, sub dimension or criteria, we would like to assess.

After selecting the scale or the dimension (o criteria) only the indicators appropriate to that level will be shown and the next choice should be done on the base of data available that relate to the performance of the practice.

The evaluation framework includes and rely on a set of indicators previously adopted and evaluated in other methods.



	A	B	J	O	P	Q	S	U	V	AA	AB	AC	AD	A
2	INDICATOR	Description or contextualisation of the indicator	ECOSYSTEM SERVICES (ES): SECTION	ES CODE	ES Class type	ES DESCRIPTOR	SDG (connection with)		SDG Target		SDG Indicator		One Health Approach (see color coding)	
3	Crop diversity index (Shannon applied to c	Also called Shannon Index. It qu	Provisioning (Biotic)	1.1.1.1	Crops by amount, type (e.g. c	Any crops and fruits grown by	Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture		2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that		2.4.1 Proportion of agricultural area under productive and sustainable agriculture		4) Promote healthy and sustainable f	
4	Equitability index (Piélou - applied to crops	Also called Piélou Index. It is cor	Provisioning (Biotic)	1.1.1.1	Any crops and fruits grown by	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
5	Number of botanical families grown on the	The focus here is on market gar	Provisioning (Biotic)	1.1.1.1	Any crops and fruits grown by	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
6	Number of varieties calculated for the mai	Number of varieties cultivated fo	Provisioning (Biotic)	1.1.1.1	Any crops and fruits grown by	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
7	Number of cultivated botanical species tha	Market gardening workshop (ex	Provisioning (Biotic)	1.1.1.3	Plant materials used as a so	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
8	Level of ecological infrastructure developm	The total number of plant specie	Regulation & Maintenance (Biotic	2.2.2.3	Providing habitats for wild pla	The presence of ecological con	Goal 15. Protect, restore and promote sustainable use of terrestr		15.3 By 2030, combat desertification, restore degraded lar		15.3.1 Proportion of land that is degraded over to		1) Protect and conserve Nature - I	
9	Production of all three vegetable categories	(stem/leaf/inflorescence, root/t	Provisioning (Biotic)	1.1.1.1	Any crops and fruits grown by	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.3 By 2030, double the agricultural productivity and incom		2.3.1 Volume of production per labour unit by class		4) Promote healthy and sustainable f	
10	Participation in the maintenance of genetic	Varietal selection makes it possi	Provisioning (Biotic)	1.2.1.2	Plants, fungi or algae that we	Wild plants, fungi algae and ba	Goal 2. End hunger, achieve food security and improved nutrition		2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals		2.5.1 Number of plant and animal genetic resources		4) Promote healthy and sustainable f	
11	Plant Species Diversity index (Shannon ap	H' applied to cultivated field and	Regulation & Maintenance (Biotic	2.2.5.1	Controlling the chemical qual	Maintenance of the chemical c	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
12	Equitability or Evenness (Piélou)	E applied to cultivated field and	Regulation & Maintenance (Biotic	2.2.4.1	Ensuring soils form and deve	Biological decomposition of mi	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
13	Number of Species	the total number of plant specie	Regulation & Maintenance (Biotic	2.2.4.2	Ensuring the organic matter is	Decomposition of biological ma	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
14	Share of grassland	Grassland areas are agricultural	Provisioning (Biotic)	1.1.5.1	Food from wild plants	Parts of the standing biomass o	Goal 2. End hunger, achieve food security and improved nutrition		2.3 By 2030, double the agricultural productivity and incom		2.3.1 Volume of production per labour unit by class		4) Promote healthy and sustainab	
15	Land Use Sustainability (LUS)	The land use sustainability indic	Regulation & Maintenance (Biotic	2.2.1.1	Controlling or preventing soil	The reduction in the loss of ma	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
16	Number of reared animal species	Diversity of reared animal specie	Provisioning (Biotic)	1.1.3.1	Livestock raised in housing ar	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.5 By 2020, maintain the genetic diversity of seeds, cultiv		2.5.1 Number of plant and animal genetic resources		4) Promote healthy and sustainab	
17	Cross-motherhood rate	Concerns the variability of femal	Provisioning (Biotic)	1.1.3.1	Livestock raised in housing ar	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.3 By 2030, double the agricultural productivity and incom		2.3.2 Average income of small-scale food produce		4) Promote healthy and sustainable f	
18	Weight of crop successions with short rete	Aims to analyze how the farmer	Regulation & Maintenance (Biotic	2.2.4.1	Ensuring soils form and deve	Biological decomposition of mi	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
19	Duration of intercropping (between two pla	Refers to arboriculture. It illustrat	Regulation & Maintenance (Biotic	2.2.4.1	Ensuring soils form and deve	Biological decomposition of mi	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
20	Number of different botanical families in th	For market gardening. In market	Provisioning (Biotic)	1.1.1.1	Any crops and fruits grown by	The ecological contribution to t	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
21	Integration of intermediate cover for agron	The use of intermediate cover o	Regulation & Maintenance (Biotic	2.2.4.2	Ensuring the organic matter is	Decomposition of biological ma	Goal 2. End hunger, achieve food security and improved nutrition		2.4 By 2030, ensure sustainable food production systems		2.4.1 Proportion of agricultural area under product		4) Promote healthy and sustainable f	
22	Share of developed biodiversity by agroec	This indicator reflects the landsc	Regulation & Maintenance (Biotic	2.2.2.3	Providing habitats for wild pla	The presence of ecological con	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
23	Diversity of agroecological infrastructures	Reflects the diversity of habitats	Regulation & Maintenance (Biotic	2.2.2.3	Providing habitats for wild pla	The presence of ecological con	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
24	Management of ecological regulation areas	these habitats act as refuge are	Regulation & Maintenance (Biotic	2.2.2.3	Providing habitats for wild pla	The presence of ecological con	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
25	Level of ecological infrastructure developm	These habitats act as refuge are	Regulation & Maintenance (Biotic	2.2.2.3	Providing habitats for wild pla	The presence of ecological con	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
26	% of host plants for auxiliary insects		Regulation & Maintenance (Biotic	2.2.2.1	Pollinating our fruit trees and	The fertilisation of crops by pla	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		1) Protect and conserve Nature - I	
27	% of trap plants for pest and disease		Regulation & Maintenance (Biotic	2.2.3.1	Controlling pests and invasive	The reduction by biological inte	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		4) Promote healthy and sustainab	
28	% of perennial plantcommunities (density)		Regulation & Maintenance (Biotic	2.2.1.3	Regulating the flows of water	The regulation of water flows b	Goal 15. Protect, restore and promote sustainable use of terrestr		15.1 By 2020, ensure the conservation, restoration and su		15.1.2 Proportion of important sites for terrestrial		2) Ensure access to clean water -	
29	Level of crop infestation (parasitism rate)		Regulation & Maintenance (Biotic	2.2.3.1	Controlling pests and invasive	The reduction by biological inte	Goal 2. End hunger, achieve food security and improved nutrition		2.3 By 2030, double the agricultural productivity and incom		2.3.2 Average income of small-scale food produce		4) Promote healthy and sustainable f	
30	Risks of damage by pest		Regulation & Maintenance (Biotic	2.2.3.1	Controlling pests and invasive	The reduction by biological inte	Goal 2. End hunger, achieve food security and improved nutrition		2.3 By 2030, double the agricultural productivity and incom		2.3.2 Average income of small-scale food produce		4) Promote healthy and sustainable f	
31	Presence of auxiliary insects		Regulation & Maintenance (Biotic	2.2.3.1	Controlling pests and invasive	The reduction by biological inte	Goal 2. End hunger, achieve food security and improved nutrition		2.3 By 2030, double the agricultural productivity and incom		2.3.1 Volume of production per labour unit by class		1) Protect and conserve Nature - Pre	

Figure 3 Print screen for the Database sheet showing the connection of each indicator to the ES, SDG and One Health Frameworks.

Data and performances of the AEP could be benchmarked or compared with the situations and data existing in the same context before the application of the AEP, or assessed time to time, to monitor the incremental achievements in time.

3.1 The database in the project phases

The database is a tool in continuous development that could also track the achievements of the project itself. In the first step it can be used to identify and map the many characteristics of most promising AEP for North Africa, while in a second moment it could support the project monitoring activities on the impact of the AEP combinations adopted by the LLs.

This database will be continuously revised and open to additional modifications. New indicators could be added, the effectiveness of some indicators will be tested, and the whole set of indicators could be connected to the general view of the project reflecting the renewed vision of knowledge time to time achieved in the NATAE's development, that will bring in a more in-depth territorial understanding of AEP potentialities for North African region.

More specifically:

- For transdisciplinary purposes, the process of internal evaluation of the database will be opened again in order to improve our views on the specific contents i.g. indicators that are more accessible to local users (i.g. cooperatives, producers etc.), or more adapted to living labs contexts.
- For academic research purpose, this methodological framework is also a guide and support to WP2 WP4 WP6 and WP3 in their methodologies and data collection so as to include different dimensions of AE assessment. Meanwhile, it is a living tool that will evolve during the project implementation to include more indicators, especially on missing dimensions (governance for example).

At the moment, the database includes a number of indicators per dimension that is not yet balanced. In particular, the number of indicators related to the "Governance" dimension is not satisfactory and sufficient to capture all the elements that NATAE's Consortium deems important for achieving of the expected outcomes.

The times of analysis and active co-creation of the documents by participants allowed a first selection of essential indicators mainly borrowed from other methodological frameworks, but we have not yet

had the opportunity to work long and all together as a consortium to produce new indicators. We also need to discuss and exchange ideas and opinions in relation to the connection of indicators to the dimensions, sub-dimensions and scales that NATAE wants to explore. The database, as well as the word document of the methodological framework, will soon be the subject of other moments of sharing and discussion and co-creation that will lead us to have a flexible but effective tool to achieve the project objectives. To this end, there are already proposals for additions and modifications that have not been yet finalized, but will certainly find space and will generate a common reflection starting from the time in which the project begins to work in the territorial contexts at the LL level. The link between indicators, dimensions and scales will be also highlighted and materialized.

In particular, the database will be enriched by additional social indicators that can be needed to assess both the AEP, and their combinations impacts, in the LLs (WP4) (see a potential list provided by WU in Table 2).

Table 2: Potential list of additional indicators required to work in the LL (WU)

Satisfaction of being a farmer
Women working in agriculture (%)
Pride of profession
Extent to which farms are involved in public activities; education, tourism, healthcare.
Number of weekends and days off
Number of accidents
Health of agricultural workers
Retention of young people in the area
Percentage of population having access to sewerage network (%)
Happy to be a farmer
Access to public services
Happiness index (OECD) of rural populations
Level of services in rural areas
Broadband coverage
Share of villages having schools and medical offices in total number of villages (%)
Share of villages having water and sewerage networks in total number of villages (%)

A phase of testing will provide and confirm indications about potential or suggested users for each indicator. It will lead to determine whether each indicator is usable by all categories of users (farmers, representative board members and researchers), or only for some of them (i.e., representative board members and researchers) or just for academic researchers.

3.2 A snapshot of the dataset

In the columns **DIMENSIONS** and **SUB-DIMENSION**, the set of indicators has been connected to the 5 dimensions relevant for NATAE, (i) environment and climate change; (ii) health and nutrition; (iii) society and culture; (iv) economy; and (v) governance, as well as to several sub-dimensions. In the column **CRITERIA** or field of competence other additional criteria have been included. These columns can be used as entry points in case the choice of indicators is made on the base of the dimensions to be explored. They are also entry points for partners to enrich and/or comment on the plurality of the dimensions and the choice of the major dimension.

Each indicator has been also connected to the different scales mentioned by the project (field/plot, farm, landscape, value chain, food system) in the column **SCALE OF APPLICATION** to enable assessing the performance of AEP trough scales.

The column **SCALE OF AGGREGATION** (field/plot, farm, landscape, value chain, food system) proposes a potential way to read the performances of AEP based on the indicators, in the case data or info are available for representative samples of the analysed universe.

A correlation of the performance of AEP to the Ecosystem Services was deemed relevant as AEPs aim at producing sufficient quantities of food by enhancing natural ecological processes and ecosystem services, and this would enable to highlight the contribution of AEPs to their provision. Therefore, many of the proposed indicators have been connected to the framework of Ecosystem Services, which is considered as another entry point for the selection of indicators. The choice of indicators across this section is facilitated through a hierarchical approach to the selection.

The column of **ECOSYSTEM SERVICES (ES) SECTION** allows to select the ES on the base of their general description. Through the **ES CLASS** the choice can be further refined. The column **ES CODE** identifies each ES and connect with the CICES V5.1 (Haines-Young and Potschin, 2018) and the adjoining columns **ES CLASS TYPE**, **ES DESCRIPTOR**, **CLAUSE OF USE** that will be automatically filled, detail information about the service that can facilitate the final choice. Not all the indicators have been connected to ES, only when the matching was sound and possible.

The potential contribution of each practice to the SDGs has been considered, although not always this was straightforward or possible since practices can each act at different scales, while altogether might contribute to achieve one or more SDGs. As a result, some (and not all) proposed indicators have been connected to the framework SDGs as another potential way to select the indicators. Here also the choice of indicators across the section is facilitated through a hierarchical approach. The column of **SDG (CONNECTION WITH)** allows to select the indicators on the base of the most relevant and corresponding SDG reporting their general description. Through the **SDG TARGET** column, the choice can be further refined, while the column **SDG INDICATOR** identifies the indicator to which potentially the practice and the corresponding indicator could contribute.

For all the indicators the potential contribution to the One Health Approach has been proposed in the column **ONE HEALTH APPROACH**. It has been done by connecting each indicator with the prescription of the WHO Manifesto. In this case the level of connection and the potential contribution should be wisely used. We propose a colour coding to express the level of appropriateness of this connection and relevance of indicator to achieve the One Health Approach. The colour coding is: blue

= weak contribution; brown = medium contribution; dark green = full contribution; red cells indicate a relevance because the indicators deal with animal husbandry. One Health Approach should be only mentioned and relevant in case of practices or combinations of practices that address the landscape or the food system level of scale.

For all the indicators of the set the connection to the most related of the 13 principles of Agroecology **HLPE** (HPLE, 2019) has been proposed.

Chapter 4

Glossary

Chapter 4 – Glossary

The present glossary is a collection of terms belonging to the specific scope of the NATAE methodological framework and project which aims to bring together high-level research and education institutions from around the Mediterranean, international organisations, and specialized NGOs with long-term presence on the ground to demonstrate that agroecological approaches, tailored locally to the diversity of farming systems, can offer adequate solutions to food system challenges in North Africa.

The NATAE glossary is part of the project's common methodological framework and serves to unequivocally share the meaning of some terms and or the concept attributed to them in the practice of the project by the partners.

AGROECOLOGY (AE) - As agroecology is in the meantime a scientific discipline, a set of practices and a social movement (Wezel *et al*., 2009). As a practice, it seeks to boost the resilience and the ecological, socio-economic, and cultural sustainability of farming systems (Oberč *et al*. 2020).

AGROECOLOGICAL PRACTICE (AEPS) - Agroecological practices embrace soil health management, biological pest, diseases and weeds control, efficient water harvesting, use of local resources, biodiversity conservation and agroecosystem integrity (Lampkin *et al*. 2016; Wezel *et al*. 2014; Oberč *et al*. 2020) and contribute to food security and livelihoods (HLPE, 2019). Agroecological practices can be very different and act at several scale of intervention from plot and farm level to landscape, value chain and wider territorial level. To bring about full food system change, AEPs can include actions that induce desired changes by acting on the three different typologies of ecosystem services, i.e., on provision services, on regulation services and also on cultural services. In Kerr *et al*. (2021) we find that "*Agroecological practices aim to optimize ecological processes, environmental and public health and well-being, and minimize social-ecological costs from agriculture such as soil degradation, water contamination, greenhouse gas emissions, exhaustion of non-renewable resources, and inequitable social structures*" (Kerr *et al*., 2021) (HLPE 2019; Wezel 2016; Wezel *et al*., 2014; Dumont *et al*., 2013).

AGROECOLOGICAL PRACTICE COMBINATION - A single AEP alone is not able to promote a change in the whole food system, but combinations of practices can act in synergic way leading to optimize ecological processes, environmental and public health and well-being, and minimize social-ecological costs from agriculture such as soil degradation, water contamination, greenhouse gas emissions, exhaustion of nonrenewable resources, and inequitable social structures" (Kerr *et al*., 2021) (HLPE 2019; Wezel 2016; Wezel *et al*., 2014; Dumont *et al*., 2013).

CROP SYSTEM – An arrangement of crop populations that transform solar energy, nutrients, water and other inputs into useful biomass ie. food, feed, fuel, and fibre. Crop system comprised of soils, crop, weed, pathogen, and insect subsystems. The crop can be of different species and variety, but they only constitute one crop system if they are managed as a single unit. The crop system is a subsystem of cropping system. For example, in the maize crop system, maize is the dominant crop which is grown in association with other crops (Rana S.S. and Rana M.C., 2011).

CROPPING SYSTEM – The term cropping system refers to the crops grown of a farm or on a site, area. It includes reference to crop sequences and management techniques used on a particular agricultural field over a period of years. It includes all spatial and temporal aspects of managing an agricultural system. Cropping system is a commonly and broadly used word to explain a more integrated approach to cropping as compared to monoculture approaches (Rana S.S. and Rana M.C.,

2011) and from a conceptual point of view is a first attempt in agriculture and agronomy to adopt a "system approach" though limited to achieving production as it consider all crops being part of a productive system (cultivation, equipment, labour, …).The term can be also referred to a wider scale of analysis considering a specific area or territory; in this case it includes reference to common crops, cultivation and management techniques and to more adopted practices (Rana S.S. and Rana M.C., 2011). From an Historical point of view, cropping systems have been designed to maximise yield, but at present, agriculture is increasingly concerned with promoting environmental sustainability at the level of farm cropping systems. A core concept of the cropping system is related to the choice of crops. The cropping system is the concept at farm level which is more straight forwardly related to value chains.

DIMENSIONS - For the purpose of our project with the term "dimensions" we refer to 5 domains: (i) environment and climate change; (ii) health and nutrition; (iii) society and culture; (iv) economy; and (v) governance. Sustainability is usually seen as a guide for economic and social policymaking in equilibrium with ecological conditions and is one of the most relevant concepts at the basis of agroecological transition. The economic, social and environmental sustainability dimensions are reported as pillars of Sustainability. For a long time since its setting, the sustainable development agenda tried to operationalize the integration of economic and social development with environmental sustainability; in this effort more dimensions were time to time added (Purvis *et al*. 2018, Najjar, 2022) governance sustainability was considered another pillar (Bogliotti and Spangenberg, 2006) as well nutrition was considered among the sustainability dimensions (El Bilali *et al*. 2019).

ECOSYSTEM SERVICE (S) - Ecosystem Services are defined as "*the benefits flowing from natural capital stocks that could be either directly or indirectly enjoyed, consumed, or used by humans to maintain or progress wellbeing*" (Maseyk *et al.,* 2017), or as "*the contributions of ecosystems to benefits used in economic and other human activity*.[18]"These services and benefits result from the interactions among biotic and abiotic components of the ecosystems (Maseyk *et al.,* 2017). They are produced along the full spectrum of well managed ecosystems (e.g., agroecosystems) to ecosystems with low human imprint (Guerry, 2015). The Common International Classification of Ecosystem Services (CICES)[19] categorizes ESs into three classes (Haines-Young and Potschin, 2018): 'provisioning', 'regulation, and 'cultural' that can be shortly described as follow: 1) *Provisioning services* are mainly related to the provision (from the wild) or production of high variety of food, feed, fibers or other goods; 2) *Regulating services*: are those that regulate environmental changes, they are very much associated with agriculture (e.g., climate regulation, pest/disease control, fluctuation in water provision and temperature) (Cardinal et *al.,* 2012; Sandhu, 2008; De Groot *et al.,* 2002); 3) *Cultural services*: are benefits obtained from ecosystems through spiritual enrichment (religion or heritage value or natural) recreation, aesthetic experience and education opportunities (De Groot *et al.,* 2002; MEA, 2015).

FARM SYSTEM – In 1988, a farm system has been defined by Fresco and Westphal as '… a decision-making unit comprising the farm household, cropping and livestock systems, that transform land, capital (external inputs) and labour (including genetic resources and knowledge) into useful products that can be consumed or sold (Fresco and Westphal, 1988). This definition content to look at the farm as a system; it goes beyond the cropping system definition as it physically includes also facilities and areas of the farm which are not directly interested by crop cultivation and growing but that are considered relevant because they are elements that impact on farmer's choices and on farm management (Fresco and Westphal, 1988). This definition is still very much used, but sometimes it is mixed up with the one of "farming system".

[18] https://seea.un.org/sites/seea.un.org/files/seea_long-bro-final-small.pdf
[19] https://cices.eu/; https://cices.eu/resources/

FARMING SYSTEM – There is a very widespread definition of "farming systems" from Dixon (Dixon, 2001) who says that "*Farming systems is a population of individual farm systems that have broadly similar resource bases, enterprise patterns, household livelihoods and constraints, and for which similar development strategies and interventions would be appropriate. Depending on the scale of the analysis, a farming system can encompass a few dozen or many millions of households*[20]". This definition helps to consider "farming systems" as *systems of farm systems* that exhibit varying degrees of interdependency and interact in use of common property resources, but the farms grouped within a type of farming system identified at a territorial level can be characterized by a series of production factors (capital and labour) whose variability can greatly influence their economic dimension and also the possibility of concretely analysing the "farming systems"(Giller, 2014); for the purposes of NATAE the diversity of farm enterprises requires that development strategies, interventions and policies could to be tailored to their different needs and opportunities.

LAND HEALTH - The concept of land health can used as a point of common interest between agriculture and conservation actors, defined as "the capacity of land, relative to its potential, to sustain delivery of ecosystem services (Shepherd *et al*., 2015).

MULTIDIMENSIONAL – The term "multidimensional" underlines the characteristic of some practices that exert their effect on several "dimensions" of sustainability. For the purpose of our project with the term "dimensions" we refer to (i) environment and climate change; (ii) health and nutrition; (iii) society and culture; (iv) economy; and (v) governance dimensions that we consider the pillars of Sustainability in North Africa. When a practice impacts, in a positive or negative way more than one dimension we can say that it has multidimensional impact. AEPs are intrinsically multidimensional as they address multiple issues at the same time and have an effect on multiple dimensions (Lucantoni *et al*., 2023) and because each AEP has a multidimensional impact as it acts promoting ecological processes at ecosystem and agroecosystem level, enhancing the provision of more ESs (Palomo-Campesino *et al*., 2018) providing multiple benefits to people and to environment.

MULTISCALE – NATAE project will act, evaluate the performance of AEPs and will identify AEPs combination in relation to five scales of intervention: 1) plot level; 2) farm level; 3) landscape level; 4) value chain level; 5) food system level. This would allow to capture the potential and actual contribution of each initiative, AEP or combination of practices to the agroecological transitions and to adapt each AEP or combination of practices to the specific contexts identified for their replicability.

NATURAL CAPITAL – Natural capital is a key concept highly related to the value of nature, ecosystem and biodiversity. The words "natural capital" indicates the world's stock of natural resources, which includes geology, soils, air, water and all living organisms, i.e., ecosystems. Natural capital assets provide people with good and services, that are called Ecosystem Services (ESs). ESs (i.e., clean water, fertile soil, ...) make human life possible and underpin our economy and society. The word and concept of Natural Capital is an extension of the economic notion of capital (resources which enable the production of more resources) to goods and services provided by Nature. The term 'natural capital' was first used in 1973 by E.F. Schumacher in his book Small Is Beautiful (Schumacher, 1973) and was developed by Herman Daly, Robert Costanza, and other founders of the science of Ecological Economics, as part of a comprehensive critique of the shortcomings of conventional economics (Costanza *et al*., 1992; Farber, 1999). Natural capital is a concept central to economic assessment ecosystem services valuation which revolves around the idea, that non-human life produces goods and services that are essential to life. The concept highlights that ecosystems/natural capital are essential to the sustainability of the economy.

[20] FAO, univ.fao.org/farming systems.

NATURE-BASED SOLUTIONS (NBS) – It is an umbrella concept that covers a range of different approaches that have emerged from a variety of fields, such as ecosystem-based adaptation, green infrastructure, and ecological restauration. Some of these approaches have emerged from the scientific research domain, while others from practice or policy contexts. However, they all share the objective of enhancing the beneficial features and processes of ecosystems to address societal challenges, such as food security, natural disasters, or climate change. More broadly, the development of the NbS concept has been grounded in the recognition of the linkages and interdependencies between people and nature, as well as an increasing understanding of the complexity of social-ecological systems. NbS acknowledges that biodiversity conservation and the protection of ecosystem services are critical for several aspects of human well-being. The NbS concept emerged as part of a paradigm shift that began in the 1980s, which viewed people as proactively protecting, managing, or restoring ecosystems to address major societal challenges, rather than being passive beneficiaries of nature (Cohen-Shacham *et al*., 2019). IUCN defines NbS as actions to protect, sustainably manage and restore natural or modified ecosystems, which address societal challenges effectively and adaptively, while simultaneously providing human well-being and biodiversity benefits (IUCN, 2020).

ONE HEALTH APPROACH – The One Health approach developed in 2000 in response to evidence of the spreading of zoonotic diseases between species and increasing awareness of "the interdependence of human and animal health and ecological change". It calls for "the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals and our environment", as defined by the One Health Initiative Task Force (OHITF)[21] (Riley, 2021; Bird *et al*., 2018). In 2004, the Wildlife Conservation Society held a conference at Rockefeller University in New York called "One World, One Health", openly recalling the term "One Medicine" coined in 1964 by Calvin Schwabe in veterinary medical textbook; in the course of the conference the twelve Manhattan Principles were created to describe a unified approach to the prevention of epidemic diseases[22] (Gibbs, 2014) These principles emphasized links between humans, animals, and the environment, their importance in understanding disease dynamics and the need for interdisciplinary approaches to prevention, education, investment, and policy development. The approach sees public health as no longer in purely human terms[23] (Rabinowitz *et al*., 2013) due to a shared environment and highly conserved physiology, animals and humans not only suffer from the same zoonotic diseases but can also be treated by either structurally related or identical drugs. The approach started to focus on devoting special care in avoiding unnecessary or over-treatment of zoonotic diseases, particularly in the context of drug resistance in infectious microbes (Scott *et al*., 2020). The objectives of "One Health" are supported by a number of organizations throughout the world including the One Health Commission (OHC), One Health Initiative, One Health Platform, The FAO-OIE-WHO collaboration, CDC One Health Office and others. FAO, the World Health Organization and the World Organization for Animal Health (intergovernmental organization, Office International des Epizooties - OIE) have published a guide to support the various countries in the fight against these diseases according to the One Health approach10. More recently, the WHO drafted a Manifesto with six prescriptions for a 'healthy and green' post-Covid-19 recovery: 1) conserve nature; 2) ensure access to clean water; 3) ensure a swift and healthy energy transition; 4) promote healthy and sustainable food systems; 5) build healthy and liveable cities; 7) reset incentives for fossil fuels. These recommendations are perfectly in line with the sustainable development objectives of the 2030 Agenda and with the foundations of One Health regarding the impact of the environment on human health.

21 "One Health : A New Professional Imperative". American Veterinary Medical Association. 15 July 2008. p. 9;
22 http://www.oneworldonehealth.org/sept2004/owoh_sept04.html
23 https://library.buffalo.edu/PDFs/onehealth.pdf

SCALE - NATAE project will act, evaluate the performance of AEPs and will identify AEPs combination in relation to five scales of intervention: A) PHYSICAL SCALE of AEPs and their impact on the sustainability dimensions: 1) plot level; 2) farm level; 3) landscape level. B) ECONOMIC SCALE of AEPs and their impact on the sustainability dimensions at 4) value chain level; 5) food system level.

SUSTAINABLE DEVELOPMENT GOALS (SDGS) – The SDGs [24]were formulated in 2015 by the United Nations General Assembly (UNGA) as part of the Post-2015 Development Agenda, to create a future global development framework to succeed the Millennium Development Goals, which ended that year. The Sustainable Development Goals [25]or Global Goals are seventeen interlinked objectives designed to serve as a "*shared blueprint for peace and prosperity for people and the planet, now and into the future*". SDGs were formally articulated and adopted in a United Nature Global Assembly resolution called the 2030 Agenda, known colloquially as Agenda 2030[26]. They emphasize the interconnected environmental, social and economic aspects of sustainable development by putting sustainability at their centre (Schleicher *et al*., 2018). There are cross-cutting issues and synergies between the different goals and on 6 July 2017, the SDGs were made more actionable by a resolution that identifies specific targets for each goal and provides indicators[27] to measure progress. The SDGs are monitored by the UN High-Level Political Forum on Sustainable Development (HLPF), an annual forum held under the auspices of the United Nations Economic and Social Council. AE strategies have thought to be optimal pathways to reach concomitantly several SDGs[28], in particular SDG1 (no poverty), SDG2 (zero hunger), SDG3 (good health and well-being), SDGI0 (reduced inequalities), SDG 13 (climate action) and SDG 15 (life on land). Integrating health and well-being across all the SDGs are both preconditions and outcomes of sustainable development and this connect to One Health Approach.

[24] https://sdgs.un.org/goals
[25] The SDGs are: 1.no poverty; 2.zero hunger; 3.good health and well-being; 4.quality education; 5.gender equality; 6.clean water and sanitation; 7.affordable and clean energy; 8.decent work and economic growth; 9.industry, innovation and infrastructure; 10.reduced inequalities; 11.sustainable cities and communities; 12.responsible consumption and production; 13.climate action; 14.life below water; 15.life on land; 16.peace, justice, and strong institutions; and 17.partnerships for the goals.
[26] United Nations (2015) Resolution adopted by the General Assembly on 25 September 2015, Transforming our world: the 2030 Agenda for Sustainable Development (A/RES/70/1 Archived)
[27] United Nations (2017) Resolution adopted by the General Assembly on 6 July 2017, Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313 Archived).
[28] https://www.fao.org/agroecology/overview/agroecology-and-the-sustainable-development-goals/en/

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Appendix

Appendix

Questionnaire for the 1st participatory workshop on the multidimensional multiscale assessment framework

The present document reports the Questionnaire delivered in the course of the 1st Workshop of Task 1.2 and the Results presented in the course of the on-line 2nd Workshop as part of the co-creation work to set up D 1.1.

The co-creation work on the methodological framework was introduced to the partners in the kick off meeting of NATAE project on 19th January 2023.

It started during Session 1 of the meeting of the NATAE project that was held in Bari, during which the questionnaire reported in this ANNEX was administered to all NATAE partners present at the Consortium Meeting held in Bari on 26th of April 2023.

The results from the questionnaire were reported at the 2nd workshop (held on-line on May the 26th) when a first draft version of the glossary was introduced to partners and made available to all for comments reviews and suggestions.

Conclusions are reported in the main document.

Working document – questionnaire for the 1st participatory workshop on the multidimensional multiscale assessment framework

This working document is a questionnaire, administered to all NATAE partners present at the Consortium Meeting held in Bari from 26 to 28 April 2023.

The questionnaire is aimed at collecting the opinions and perceptions of the participants to contribute to the ongoing collective work on the multidimensional and multiscale methodological framework.

It will allow to collect data on the perceptions of the partners in relation to the process of construction of the methodological framework of evaluation of the performance of agro-ecological practices (AEPs) for North Africa.

This format will be attached to Deliverable 1.1 due for Month 7 of the NATAE project.

Horizon Europe's NATAE Project Consortium Meeting

1st participatory Workshop on the multidimensional multiscale assessment framework

Date	**26 - 28 April 2023**
Time	**14h00 – 16h30**
Location	CIHEAM Bari Valenzano (BA)
Type of meeting:	**Partners' Participatory Workshop**
Reviewer:	Elen Lemaitre-Curri, Melanie Requier-Desjardins
Authors:	Marie Reine Bteich, Generosa J. Calabrese

26th April 2023

NATAE Project

Task 1.2 Building a multidimensional, multiscale evaluation framework on AEP performances in NA

1st Meeting of participants to NATAE project (including LLs leaders) to build a Conceptual Methodological Framework for the assessment of the Performance of Agroecological Practices

Dear Participant,

Welcome to this first workshop of Task T1.2 - Building a multidimensional, multiscale evaluation framework on Agroecological Practices (AEPs) performances in North Africa.

This is the first of three meetings to which all project participants will be called to participate. This first meeting aims at co-creating the methodological conceptual framework that will accompany us in all phases of the project. In future meetings you will be free to continue contributing to the process or to delegate your participation to a member of your work team.

WP1 aims at developing a conceptual integrated evaluation framework to perform a multidimensional assessment of the performance of AEPs combinations to evaluate their potential and actual contribution to agroecological transitions.

Evaluation will be at the basis of our common work and different evaluation moments are foreseen in all WPs from WP2 to WP7 and results of the steps of evaluation will contribute to the overall project achievements and impact and finally flow and converge in the scientific reflexivity on the project evaluation methodology.

The conceptual framework will include the concepts underlying all our actions, the selection criteria of the AEPs and the basic settings that will motivate our evaluations and, also our project actions. It is an ambitious and complex work that begins now and will continue throughout the project to accommodate all the conceptual and practical facets that will express the adaptation of the evaluation methodological frameworks to the reference contexts in which we perform our actions. The final result will contribute to the construction of the NATAE project identity.

This type of work requires the participation and contribution of all partners and of all the people involved through various competencies in the project activities and will be particularly useful in capturing points of view.

The structure of the conceptual framework will be built based on the understanding of the project requirements. It will be gradually defined and refined all through the project to best accommodate the understanding, needs and innovative ideas that will be generated. It will become the first of the chapters of the NATAE Guidebook (D 1.3 due in month 48).

This questionnaire serves to share some basic aspects and collect your individual opinions on some key issues. We ask you to participate and answer the questions in your own capacity using the pre-filled answers or adding further elements to the conceptual framework. The answers are personal to better understand the variety and diversity of opinions. Answers will be reported and shared through descriptive statistics to provide a concrete contribution to the process of constitution of the common conceptual framework of the NATAE project.

How we will work together

Each question will be briefly introduced by the working group of Task 1.2, then space will be given to eventual questions or clarifications. Subsequently we kindly ask you to flag an option, write your own answer and/or add more details. Later, when the work will touch the field aspects, you will be contacted at the email address reported bellow in case further details or integration are needed. Your answers will be collected at the end of the working session and results will be shared with all participants.

For each question you may choose one or more a answers/options.

Please fill the following:

Affiliation	
Role in the project	
Field of competences	
e-mail	

Let's start!

Q1 – Various multidimensional evaluation methods for Agro-Ecological Practices (AEPs) have been developed in the past years to meet different objectives and Agro-Ecological Practices will be evaluated for their performances in NATAE WPs (for example in WP2 and WP4) following different objectives.

What is, according to you, the main purpose or objective for evaluating the performances of agroecological practices in the NATAE project and contexts?

- To evaluate the effects and impacts of agroecological practices in environmental, agronomic, economic, and social domains in order to accompany/support the farmers
- To identify most promising AEPs on the base of their performances tailored for North-African countries
- To foster the development of agroecology in identifying breaks and levers of agroecological transition process
- To influence public policy and decisions-makers
- Other, please specify:

Q2 – Who do you think should be or will be the end-users of NATAE AEPs performances evaluation framework?

- Farmers
- Living labs
- Experts and researchers of the consortium
- National and international organisations working on AE pathways and transitions
- All the above
- There is no need to specifically consider this issue
- Other, please specify:

Q3 – How the multiple dimensions[29] of the AEPs can be embraced by the NATAE AEPs performances evaluation framework?

- The performance of each AEP or AEPs combination will be analysed/evaluated considering the impacts and achieved benefits on the economic, social, governance and environmental dimensions
- AEPs will include practices with good performances in all the four dimensions
- AEPs will include practices with good performances in at least two dimensions
- Other, please specify:

Q4 – How the multiple scale[30] of the AEPs can be embraced by the NATAE AEPs performances evaluation framework?

- The performance of each AEP or AEPs combination will be analysed/evaluated based on impacts on plot, farm, value chain and territorial scale
- AEPs will include practices with good performances in all the four mentioned scales
- AEPs will include practices with good performances in at least two of the mentioned scales
- Other, please specify:

Q5 – How the diversity of approaches, definitions, and reference frame of agroecology will be fitted in the NATAE AEPs performances evaluation framework?

- The theoretical and specific approach of the project will be developed at the end of the methodological framework construction process
- The approaches and expectations of the various partners will be collected and flow into the identity approach of the project
- The approach will reflect the agroecological principles of the HLPE (High-Level Panel of Experts)
- The approach will reflect the agroecological components of FAO
- There is no need to specifically consider this issue

[29] The considered dimensions are: environmental dimension, social dimension, economic dimension and governance dimension, reflecting dimensions of sustainable development: economic development (including ending extreme poverty), social inclusion, environmental sustainability, and good governance (including peace and security) (The future we want: outcome of the Conference on Sustainable Development, Rio de Janeiro, Brazil, 20-22 June 2012).
[30] The scales mentioned by the NATAE project proposal are: plot, farm, value chain and territorial scale.

☐ Other, please specify:

Q6 – How complex our framework should be to evaluate the AEPs performances?

- ☐ Very simple: simplified method easily applicable by all partners of the project and understandable by end users
- ☐ Complex: Complex method allow better detailed evaluation though might limit usability by all end users
- ☐ Flexible enough to meet a degree of precision coherent with the project outputs and needs
- ☐ Other, please specify:

Thank you for your answers! 😊

Working on Multidimensional and Multiscale Evaluation Framework

WP1 Task 1.2

M.R. Bteich, G.J. Calabrese,

26th/05/2023

Short report on the output from questionnaire from the 1st participatory workshop on the multidimensional multiscale assessment framework

The questionnaire was submitted to all partners attending to the session and was filled by 46 participants. A short report of the results is here given.

All the 23 institutions members of the NATAE's Consortium answered the questionnaire.

46 questionnaires were collected, 5 of which from the advisory board members

Only 2 responses were without any specification about the institution of origin.

Q1. Various multidimensional evaluation methods for Agro-Ecological Practices (AEPs) have been developed in the past years to meet different objectives and Agro-Ecological Practices will be evaluated for their performances in NATAE WPs (for example in WP2 and WP4) following different objectives.

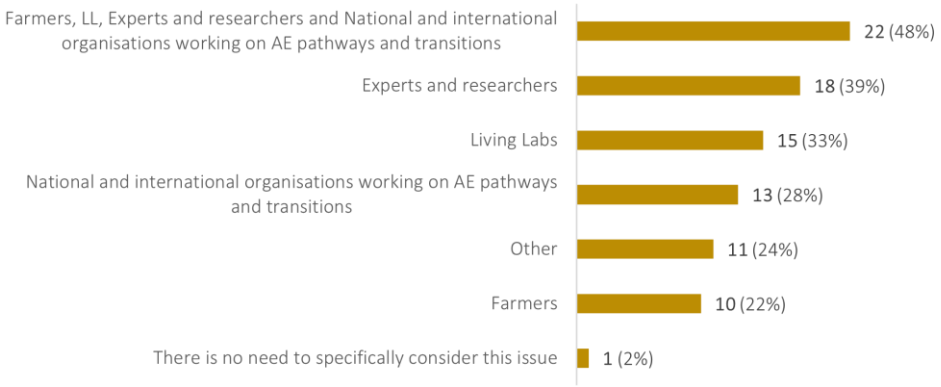
Total answers 46

Comments added by participants in the note:

1. *Develop diagnostic tools and the dissemination of agroecological practices and promote local expertise*
2. *Refers to the 2nd choice: also consider Mauritania, which is participating in the project*
3. *The first option results will influence the second option of one choice*
4. *Determine how farmers assess the performances of AEPs (what performances mean for them)*
5. *To support agricultural development in N.A. taking into account environmental, economic and social domains, AEP are a tool for this*
6. *For stakeholders on the ground to be empowered in their own progress/development*
7. *To evaluate the effects and impacts of agroecological practices in environmental, agronomic, economic, and social domains in order to accompany/support the farmers evaluating*
8. *I am bit concerned about the idea of identifying the "most promising AEPs" since the AEPs will vary by socio-economics + environmental context within a region*

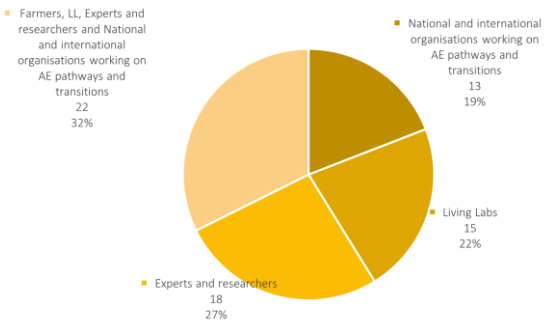
Q2. Who do you think should be or will be the end-users of NATAE AEPs performances evaluation framework?

Total answers 46



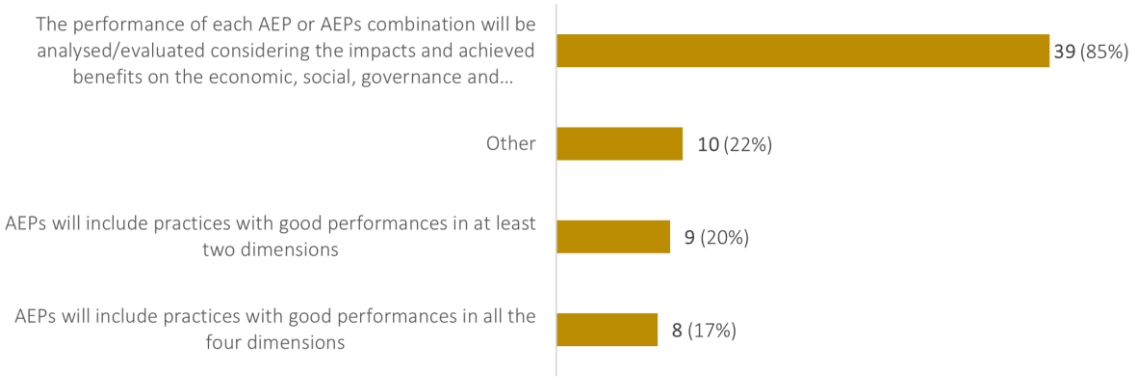
Comments added by participants in the note:

9. *Due to the transdisciplinarity of NATAE & even though those different audiences may use these evaluation in different ways... , framework.*
10. *For farmers it depends on the level of evaluation, in Morocco some farmers are illiterate*
11. *Students and researchers outside the consortium*
12. *As well as future experts/research projects*
13. *Some farmers, not all. Private companies through the promotion of agroecological practices*
14. *Decision makers*
15. *Farmers' advisors*
16. *Farmers' advisors and decision makers*
17. *The framework is too complicated so farmers cannot use it*
18. *The country policy - Ministry of Agriculture*
19. *As a transdisciplinary project the information should be useful for multiple stakeholders*



Q3. How the multiple dimensions[31] of the AEPs can be embraced by the NATAE AEPs performances evaluation framework?

Total answers 46



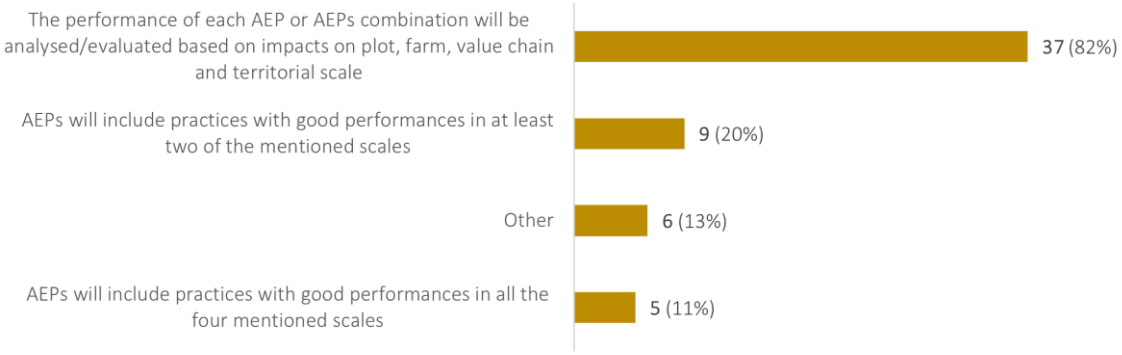
Comments added by participants in the note:

1. *Considering a diversity of dimensions and subdivisions of AEP is needed to clarify potential trade-off/ synergies between these dimensions (i.e., to enrich knowledge of what is AE and what can AE perform or not = AE boundaries*
2. *Yet, beware of "no regret" measure and report should be positively framed and take into consideration the incremented (stepwise) nature of the AE transition. Important to have EAP as a cost & waste saving mechanism and their focusing on AEP that won't jeopardise farmers income!*
3. *a question: how to fit the specificities of each LL context?*
4. *Even if the performance of an AEP doesn't improve on all four dimensions, it should certainly not have a reduced performance in any of them, compared with the current practices.*
5. *More equity, reducing inequalities. special focus on local communities and gender issues. We must integrate "bad" performances in certain areas: trade-off / arbitration*
6. *the first answer seems to be the only proposed that could consider synergies, trade-offs, bad performances of AEP in/between dimensions*
7. *Knowing that it will not always be possible to link a practice to each dimension*
8. *By considering how farmers evaluate the performance of their practices (the goal being to enrich the most common evaluation framework with farmers' criteria)*
9. *AEPs will include practices with good performances in all the four dimensions taking into consideration the context and cases*
10. *I think it is important to assess all dimensions - holistic like agroecology + show trade-off + synergies*

[31] [1] The considered dimensions are: environmental dimension, social dimension, economic dimension and governance dimension, reflecting dimensions of sustainable development: economic development (including ending extreme poverty), social inclusion, environmental sustainability, and good governance (including peace and security) (The future we want: outcome of the Conference on Sustainable Development, Rio de Janeiro, Brazil, 20-22 June 2012).

Q4. How the multiple scale32 of the AEPs can be embraced by the NATAE AEPs performances evaluation framework?

Total answers 45



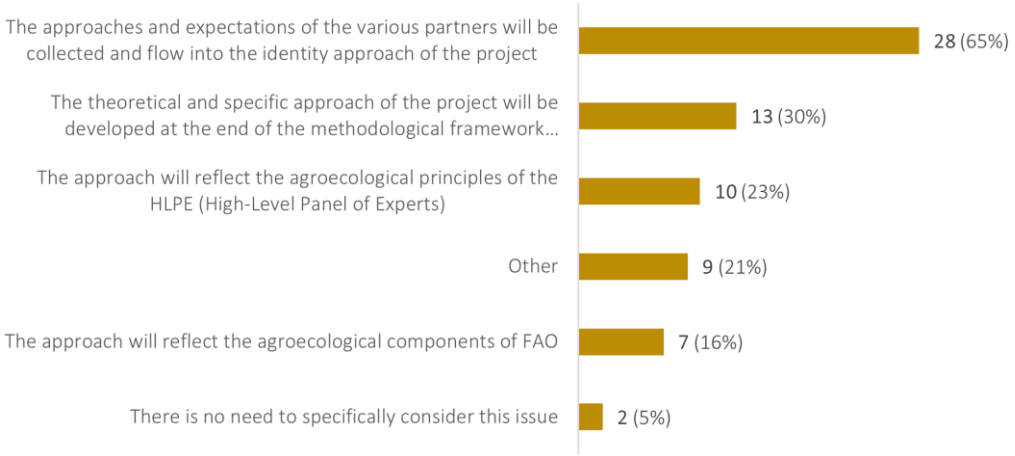
Comments added by participants in the note:

1. *We will improve our knowledge and understanding of what AE is (can be a realistic way)*
2. *If we are to capture the impacts of national level and on multiple value chains (food system) then economy-wide analysis is required, to capture WF, CS & PS changes on the entire economy. I suggest partial equilibrium or general equilibrium (CGE) as modelling approach*
3. *The first answer seems to be the only proposed that could consider synergies and trade-offs between scales, and bad performances of AEP in a specific scale*
4. *As long as the impact on a given scale exists indeed "the value chain is interscalar per itself!!*
5. *One CGIAR - Agroecology initiative is working for identifying the different indicators for different innovation. It may add value to collaborate with this innovation*
6. *The performance should look at trade-offs between scales, relevant scale*

[32] The scales mentioned by the NATAE project proposal are: plot, farm, value chain and territorial scale

Q5. How the diversity of approaches, definitions, and reference frame of agroecology will be fitted in the NATAE AEPs performances evaluation framework?

Total answers 43

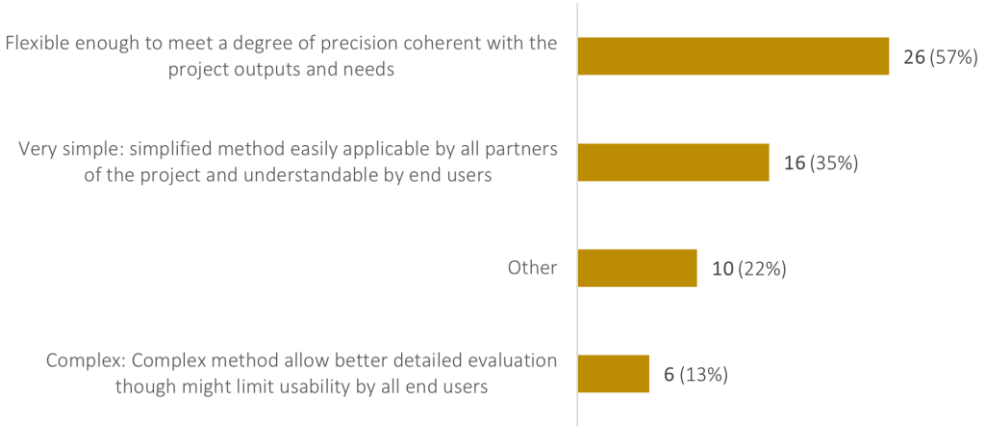


Comments added by participants in the note:

1. *Build on approaches already developed by consortium members or others*
2. *We should be more inclusive and gather all the opinions if we want to stick with the stakeholders*
3. *Special importance should be given to undocumented, de-facto, AEPs that are consciously or unconsciously practical by farmers (farm to fork, home production for home consumption)*
4. *consider SDG*
5. *The final approach should take into consideration and build upon the statements in point 2-4*
6. *EAP assessment is a "living" and adaptive process, combining (time and space), with feedback loops. We should avoid being locked into an ex ante or ex post normative framework*
7. *The diversity of interests of different partners should be considered for each territory*
8. *The WP leaders could propose what they consider as the most relevant approach, definitions, the most important point being to open regular discussions during the implementation of the project*

Q6. How complex our framework should be to evaluate the AEPs performances?

Total answers 46



Comments added by participants in the note:

1. *In my opinion the objective is to have an effective and not simple evaluation framework, even if the use will be limited!*
2. *It depends on the end users*
3. *Flexible enough to meet a degree of precision consistent with the project outputs and needs, It depends what we call complex. The definition in 8 WP is complex by nature. Results needs to be understandable but the framework is to be detailed*
4. *Should also be transparent to the stakeholders and the public (science communication, style and less Jargons)*
5. *It depends on the end users*
6. *The complexity of the method will depend on data availability, it should be as complex and detailed as the data available allows. Data availability not just for us as consortium but for the end-user who will implement the method.*
7. *The framework and its level of complexity must be adapted to the end users of the results. Identify the recipients of quantified "advocacy" according to the territories and the LL*
8. *Diversity of partners and territories along with the diversity of AEPs need flexible framework*
9. *But it should still make sense*

NATAE

North African Transition to AgroEcology

www.natae-agroecology.eu

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