Ecological Vineyards Governance Activities for Landscape's Strategies

Deliverable T1.1.1.

Document with definitions, criteria and methods for selection of demonstrative viticulture area and agro-ecological vineyards

Responsible Partner

Provincia Autonoma di Trento

date 05/11/2020

BASIC PROJECT INFORMATION:

PROGRAMME CALL: INTERREG V-B Adriatic-Ionian ADRION
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DOCUMENT INFORMATION

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Contributors	PP2
Dissemination Level	PPs

Project Summary

ECOVINEGOALS promotes sustainability and resilience in the winemaking industry by encouraging the transition of intensive viticulture towards agroecological management systems that protect natural habitats and landscapes, while reducing chemical and fossil fuel inputs and harmful emissions. The project aims to enhance stakeholders' skills in participatory local governance, to strengthen transnational cooperation and provide specific transnational instruments to promote, support and manage the agroecological transition.

Expected results

- Sharing between partners in the ADRION countries of fundamental concepts and practices necessary for the transition from intensive viticulture management systems, towards agroecological management methods.
- Improvement of the participatory local governance skills of decision makers and all other viticulture stakeholders, both public and private, to jointly develop and define strategies and plans aiming to protect natural habitats and rural landscapes.
- Transnational communication, cooperation, and exchange between regional authorities and civil society organizations concerning common objectives to protect vulnerable environments, to promote ecosystem services, to prevent or mitigate climate change, and to avoid social conflicts in land use.
- An increase in the number and quality of tools and strategies available to support the planning and management of the agroecological transition of viticulture systems in the region.

Partnership:

PP1- LP	**LAG EASTERN VENICE, VEGAL (IT)**
PP2	Autonomous Province of Trento, PAT (IT)
PP3	Chamber of Agriculture and Forestry of SIovenia, KGZS-Zavod GO (SI)
PP4	Research Centre of the SIovenian Academy of Sciences and Arts, ZRC SAZU (SI)
PP5	Agency for rural development of Istria Ltd. Pazin, AZRRI (HR)
PP6	Association for the promotion of employment, vocational training and education, INFORMO (HR)
PP7	Business Development Center Kragujevac, BDCKG (RS)
PP8	Foundation Business Start-up Center Bar, BSC BAR (ME)
PP9	Municipality of Bar, BAR (ME)
PP10	Mediterranean Agronomic Institute of Chania, CIHEAM MAICh (EL)

Associated Partners (APs):

General Union CISL Cultivators Venice (IT)
Bio district of production and biological community of central-eastern Venice - BIO VENICE (IT)
IAL - Innovation Learning Work S.r.l. - Social enterprise (IT)
AIAB-Italian Organic Agriculture Association (IT)
Agroecologiki SP (EL)

Municipality of Topola (RS)
Šumadija winemakers association (RS)
Ministry of Agriculture and Rural Development (HR)
Agroecology Europe (BL)

INDEX

INTRODUCTION

General objectives of the project are to define a common vision among the partners on agroecological principles and methods to be applied in vineyards, to promote agroecological transition in fragile viticultural areas, preserving ecosystem and traditional landscapes, identification of suitable tools and procedures, within a transnational agroecological strategy of the Adrion area in order to define integrated action plans in selected wine areas in partner regions.

ACTIVITY T 1.1

This activity is carried out through a review of definitions on agroecology and of experiences and practices already known and available to be applied to viticulture. The activity is carried out by PP2 (Provincia Autonoma di Trento), in collaboration with all other PPs, in order to achieve a shared transnational construction of tools that will allow selection of wine-growing areas of experimentation and of the pilot farms, as well as the choice of multi-criteria indicators that will allow monitoring of their agroecological and economic-productive performance.

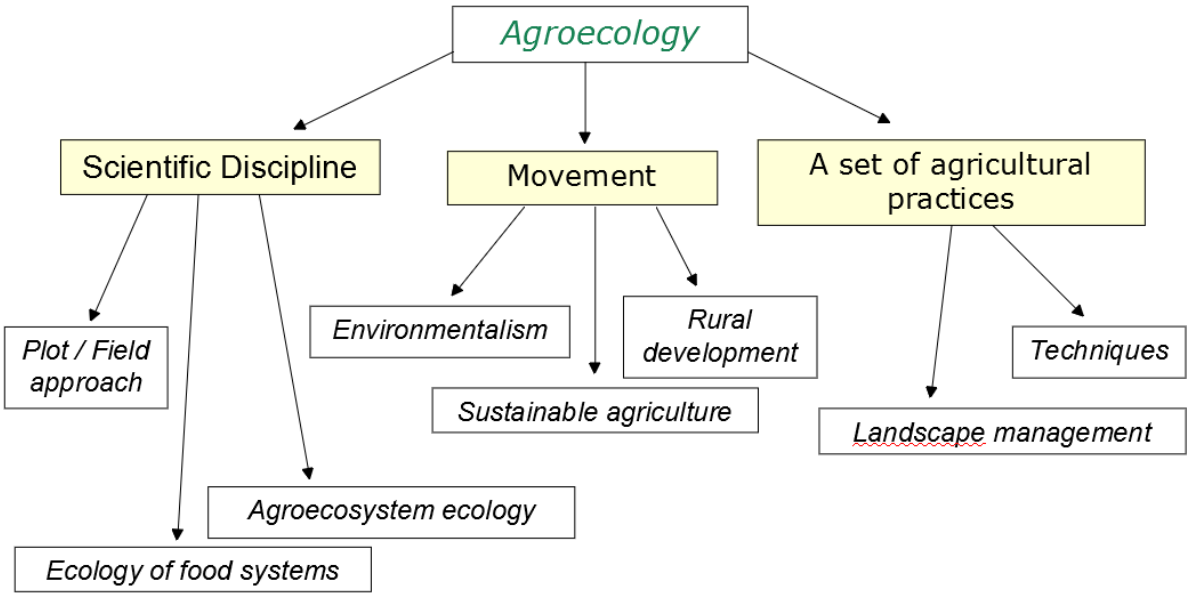
Construction of shared methods and ***criteria*** for the identification of agro-ecological systems, viticultural areas and pilot viticultural farms in each region involved.

Delieverable T 1.1.1

The goal of this deliverable is to produce definitions, criteria and methods for selection of demonstrative viticulture areas and agroecological vineyards.
Report containing the following: shared definition of agroecological system applied to viticulture sector. Criteria and methods for selection of wine-growing areas in each country involved in the project. Methods for structural analysis of demonstration areas. Criteria and methods for selection in each identified wine-growing area of agro-ecological pilot farms that already adopt agro-ecological viticulture systems. Detenction indicators for the field analysis of the agroecological and productive-economic performances of the selected pilot viticultural farms. Processing structure of the results of the field analyzes, finalized to drafting of local action plans and a transnational strategy for the agroecological transition of the wine-growing areas of the ADRIO regions.

1. WHAT IS AGROECOLOGY?

Agroecology is considered jointly as a science, a practice and a social movement.
It encompasses the whole food system from the soil to the organization of human societies. It is value-laden and based on core principles. As a science, it gives priority to action research, holistic andparticipatory approaches, and interdisciplinary that is inclusive of different knowledge systems. As apractice, it is based on sustainable use of local renewable resources, local farmers' knowledge andpriorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that providemultiple benefits (environmental, economic, social) from local to global.
As a movement, it defends smallholders and family farming, farmers and rural communities, local andshort food supply chains, diversity of indigenous seeds and breeds, healthy and quality food. Agroecologyacknowledges that the whole is more than the sum of its parts and hence fosters interactions between actors in science, practice and movements, by facilitating knowledge sharing and action.



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1.1 PRINCIPLES OF AGROECOLOGY

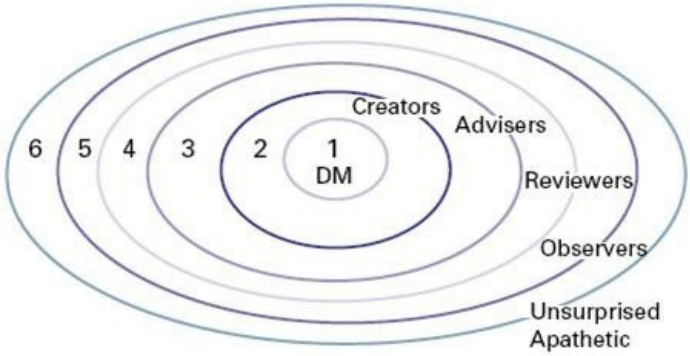
DEFINITION OF AGROECOLOGY IN UNITED NATIONS DOCUMENTS (CONSOLIDATED SET OF

13 AGROECOLOGICAL PRINCIPLES,2019)

1. **Recycling.** Preferentially use local renewable resources and close as far as possible resource cycles of nutrients and biomass.
2. **Input reduction.** Reduce or eliminate dependency on purchased inputs.
3. **Soil heath.** Secure and enhance soil health and functioning for improved plant growth, particularly by managing organic matter and by enhancing soil biological activity.
4. **Animal health**. Ensure animal health and welfare.
5. **Biodiversity.** Maintain and enhance diversity of species, functional diversity and genetic resources and maintain biodiversity in the agroecosystem over time and space at field, farm and landscape scales.
6. **Synergy.** Enhance positive ecological interaction, synergy, integration, and complementarity amongst the elements of agroecosystems (plants, animals, trees, soil, water).
7. **Economic diversification.** Diversify on-farm incomes by ensuring small-scale farmers have greater financial independence and value addition opportunities while enabling them to respond to demand from consumers.
8. **Co-creation of knowledge.** Enhance co-creation and horizontal sharing of knowledge including local and scientific innovation, especially through farmer-to-farmer exchange
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
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
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.
12. Land and natural resource governance. Recognize and support the needs and interests of family farmers, smallholders and peasant food producers as sustainable managers and guardians of natural and genetic resources
13. Participation. Encourage social organization and greater participation in decision-making by food producers and consumers to support decentralized governance and local adaptive management of agricultural and food systems.

2. SUGGESTIONS FOR LOCAL STAKEHOLDERS (LSH) IDENTIFICATION AND EVALUATION

A local stakeholder (LSH) is anyone or any group or any institution or organization that can have any kind of interaction/relationship with the project in your territory.
Among the AE principles participation is highlighted in order to support decentralized governance and local adaptive management of agricultural systems. Of course there are different levels of participation and involvement regarding project objectives and activities.



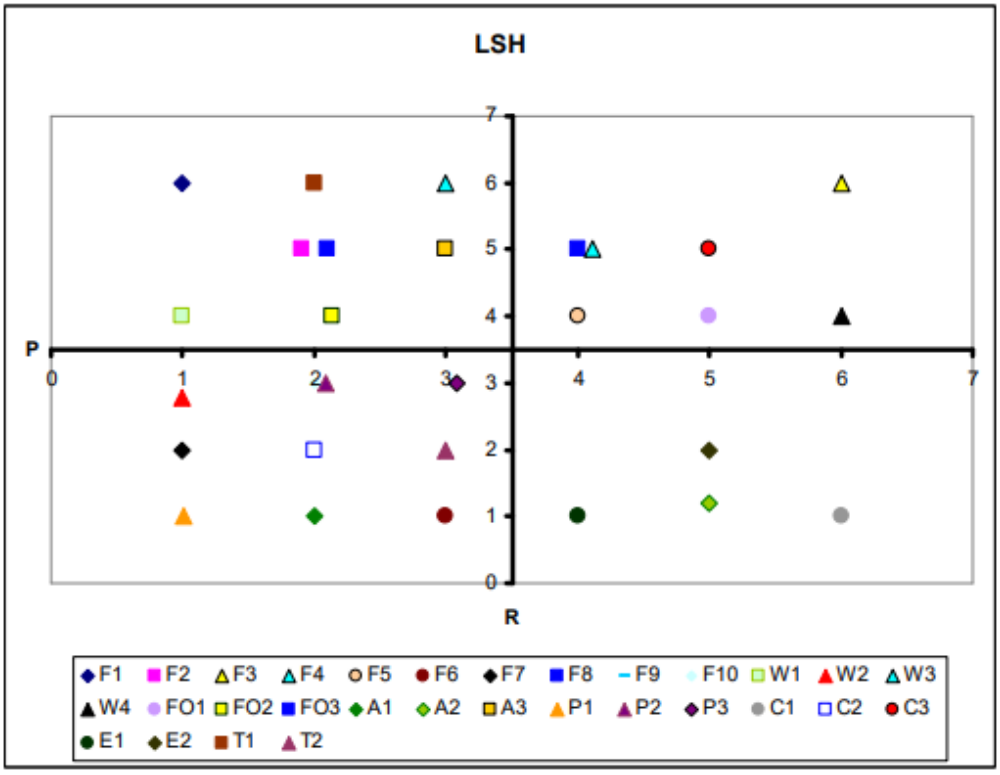
Some LSHs can play an "*active role*", as for example the pilot farms adopting some of the AE best practices or the consultants that help farmers for their implementation or the farmer's organizations that support the AE transition; some others LSHs are "*interested*" because they think they can benefit from the project activities and results, participating at meetings, seminars, technical visits to the pilot farm, consultancy or, on the other hand, others LSHs could be concerned because they see you as a competitor for founds or someone that can create problems in the "business as usual" frame; others LSHs can sustain or contrast the project from outside without having an active role or a specific interest in it but only on the basis on how close or far is the "project vision" from their personal or institutional "general vision". Any way, any local stakeholder can influence positively or even negatively the project activities and can be influenced by the project work.
It is important to identify and to evaluate LSHs position regarding the project at the beginning, during and at the end of the project life in order to understand if our work is effective and it is going on the right way for reaching the project expectations.
These short suggestions can also aid you in delivering the Report on methodology of active involvement of transnational partners (T1.1.2.). Other information and methods will be available in the participatory governance framework and key indicators document forWP4-T3

LSHs evaluation in each project stage has different method and purpose:
At the beginning: try to make a first list, with the information that you already have from previous experiences or using official database, grouping the stakeholders according their activity: farmers (F), wine producers (W), farmer's organisations (FO), associations (A), public institutions (P), professional organizations and consultants of agricultural sector (C), public or private bodies working on environment issues or for protected areas (E), wine route or other tourism related organisations (T)…

- remember to send to all of them a simple and clear information about the project or contact LSH personally (email, leaflet, letter, telephon..).
- assign to each one a value (from 1 to 6) for two parameters **relevancy** and **potential** (scale 0-7; central value 3,5)

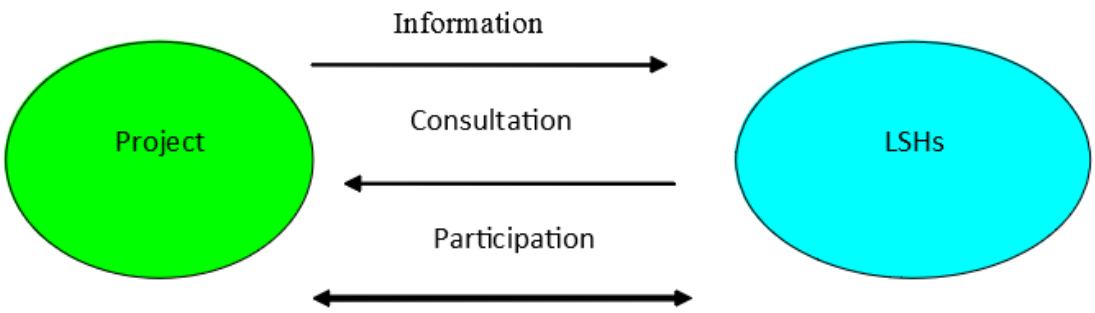
Relevancy/interest: measure the interest and the role that you think the LSH has in the success or failure of the project (level of interest);
Potential: measure the capacity of the LSH to contribute or to contrast the project depending on its relative position within the civil society, number of members, type of organization ecc…(level of influence)

Remember that is an internal evaluation based only on your opinion, don't circulate it because nobody likes to be classified, use code and not names.
This allows you to perform different communication strategies (inform, consult, involve, collaborate, empower) according the position in the quadrants (I high potential and high relevancy; II high potential and low relevancy; III low potential and low relevancy, IV low potential and high relevancy).



During the project life: prepare and send simple questionnaires, 4/5 questions with closed answer and only one with open answer, in order to understand if your initial opinions were correct or not and try to understand better expectations, concerns, motivations, needs, influence capacities of the LSH. On this basis you can build a more complex grid and adapt your initial evaluation work and communication strategy.
At the end of the project: you should focus on the key LSHs, as defined after the second assessment procedures, because they should commit themselves to joint the permanent network AVINE so is necessary to make another evaluation in order to understand their potential, relevancy, interest, expectations regarding the new phase.

Communication flow:



3. NOTE FOR LANDSCAPE UNIT AND PILOT AREA IDENTIFICATION

Introduction

According the project prevision, we have to select in each partner country at least one demonstration area using common criteria. For Italy: VEGAL (a plain area), PAT (a mountain area); for Slovenia: Nova Gorica Institute of Agriculture; for Croatia: AZRRI; for Serbia: BSC-Kraguievac; for Montenegro: BSC Bar; for Greece: MAICh. The partners: ZRC-SAZU, INFORMO and Municipality of Bar, will play a supporting role.
For each area the Partners have to provide data based on already existing information (statistical sources) and on indications of stakeholder involved and describe its fundamental geographical, political, economic and social structural characteristics.
Within the selected area the Partners have to identify an appropriate number of vineyards pilot farms that will be invited to join the ECOVINEGOALS farms network adopting different agroecological practices selected from the common list or others suggested by the farms and add to the list after a technical evaluation from the project board. The number of best practices applied could be the indicator for the agroecological intensification at farm level. The farms that are already adopting agroecological practices will be taken as example for the farms approaching agroecology for the first time.
Moreover the pilot areas, in order to be able to define agroecological models for the preservation and enhancement of cultural landscape heritage, should have a significant territorial and economic scale and contain at least one intensive wine-growing area that can be defined “fragile” according habitat, landscape and social aspects.
The Deliverable T1.2.1 consists in a report made for each area containing the description of the following aspects: structural data of viticultural farms; identification of the viticulture systems; identification of environmental, economic and social problems and conflicts.
At least one meeting with stakeholders will be carried out in each area, with the aim of identifying farms that will decide to apply agro-ecological practices.

Working methods

For the individuation of the criteria for the selection of the demonstration areas we have to consider the multidisciplinary approach of ECOVINEGOALS and trying to satisfy the practical and methodological needs of the three project thematic pillars: agroecological practices (WP2-T1) – landscape and habitat (WP3-T2) - participatory governance (WP4 –T3). In other words, the territorial breadth/extension and the various elements that are included in it, should able to give us enough information for develop strategies and action plans combining local scale and regional scale. We should integrate different method for capturing the multifunctional dimension of the landscapes: productive, natural and cultural aspects of the landscape combining the biophysical approach to landscape with the historical and social-cultural approach to landscape.

We have to take in consideration:
- geo-ecological and land-use-related properties of the landscape (soil properties, geo-morphology; geological and climate condition; hydrography; type of natural vegetation)
- visual perception and socio-cultural aspects of the landscape; (perception of the stakeholders, perception of the tourists, historical heritage, cultural functions provided by agricultural landscapes, visual art evidences related to a specific landscape).
- spatial analysis of the variation in the presence and/or abundance of landscape elements (artificial areas; agricultural area not vineyard; vineyard area; natural areas; water; disturbing elements, attractive elements).

We invite you to explore the possibility to use CORINE Land Cover (CLC) that could be an useful instrument for a first territorial analysis (data 2018) https://land.copernicus.eu/pan-european/corine-land-cover/clc2018 .

The proposal is to define an area in which there is a certain numerous and degree of variability of the various parameters considered in order to be able to analyse the viability and the effects of the agroecological practices in the different situations.
The pilot area should contain a minimum number of the following elements:
- Number of total viticulture farms: more than 20.
- Number of settlements/villages: more than 4 settlements or 2 villages, number of total inhabitant: more than 1000.
- Type of vineyards: at least three different grape varieties.
- Type of farm productions: at least two among this: a) farms that are producing only grape (monoculture vineyard farm) and b) farms with mixed production address in which vineyard prevails, c) farms with mixed production address in which vineyard is not prevalent d) farms with vineyard and livestock breeding.
- At least one intensive wine-growing area, using conventional method for grape cultivation;
- At least one vineyard area with farms already using agro-ecological practices.
Consider that more variability we have in the farming methods within the pilot area more richness we'll have in the data analysis, in the debate, discussion and social learning among farmers.
Presence of natural areas: at least 50 ha.

In order to be sure to reach all the criteria above mentioned we suggest starting the work analysing two different pilot areas in our region and than chose the one that can give you more chance to better perform the project activities.

When the pilot area is definitively selected the partner should make a landscape character assessment analysing the six landscape dimensions (see Groom 2005):
(1) the biophysical dimensions; (2) landscape ecological issues; (3) socio-economic-technical dimensions; (4) historical dimensions; (5) human-aesthetic dimensions; and (6) user participation and policy dimensions.

Definitions

- *Landscape*: ‘‘an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors’’ (Council of Europe, 2000 ELC)
- *Landscape*: ‘‘the visible features of an area of land, including physical elements such as landforms, living elements of flora and fauna, abstract elements such as lighting and weather conditions, and human elements such as human activity or the built environment” (Sustainable Sites Initiative, 2007, p. 1)
- *Winescape*: a specific kind of servicescape: i.e. those activities complementary to the product that facilitate the marketing of services composed by: ambient conditions; spatial layout and functionality; signs, symbols and artefacts.
"The “winescape” encapsulates the interplay of: vineyards; wineries and other physical structures; wines; natural landscape and setting; people; and heritage, town(s) and buildings and their architecture and artefacts within, and more."
- *Landscapital*: is how a landscape is perceived - in terms of values - by the autochthonous actors that live and shape a territory (hereafter, “locals”); and the extrinsic landscapital, that is how a landscape is perceived - in terms of values - by the visitors that enjoy a landscape.
- *Landsmarkers:* the symbolic elements of a landscape.
- *Landscape character:* ‘‘distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather then better or worse’’ (Swanwick, 2002).

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Groom, G., 2005. Methodological review of existing classifications. In: Wascher, D.M. (Ed.), European Landscape Character Areas – Typology, Cartography and Indicators for the Assessment of Sustainable Landscapes, Final ELCAI Project Report, Landscape Europe (pp. 32-45).

BEST PRACTICES LIST, 13.07.2020

	Best practice	**Note**	**on course ■; done ▶**
1.	Agroforestry		▶
2.	Biodistrict	Biovenezia, biodistretto Valle dei laghi	▶
3.	Biodiversity friend	CSQA	▶
4.	Biostimulants		▶
5.	Canopy management		▶
6.	Cover Crop		▶
7.	Dry stone walls		▶
8.	Green manure		▶
9.	Harvest with hands	SLO	▶
10.	HNV		▶
11.	Weed mechanical management		▶
12.	Irrigation		▶
13.	Landscapital Board game	FEM	▶
14.	Mating disruption		▶
15.	Mulching	PAT	▶
16.	Participatory guarantee system	Valoritalia	▶
17.	Participatory land maintenance systems; land stewardship		▶
18.	Placing nests for birds and pollinator insects		▶
19.	Pyro weeding		▶

20.	Reduce the pesticides		▶
21.	Resistant grape varieties		▶
22.	Social learning and knowledge generation	SLO	▶
23.	Soil fertility monitoring (fertilization plan)	SLO	▶
24.	Wine routes	Wine routes – SLO/PAT	▶
25.	Wood poles		▶
26.	Strategies for communication agroecology products (wines from resistant varieties)	Biovenezia	▶
27.	Erosion prevention		▶

4. IDENTIFICATION OF INDICATORS

Aim of this document is the identification of indicators to be used by project partners during ECOVINEGOALS project implementation.
Indicators (first column/theme) are classified according **agri-environment**, **economic**, **social** and **landscape cultural heritage** issues and for different themes. In the second column are listed the sub-indicators that can give you the information required to define the level of the theme indicator.
Indicators are used for identifying and quantifying, at different scale of observation (filed, farm, landscape unit), the actual situation of the pilot areas and the future changes, after the adoption of agroecological practices (pressure-state-response framework). Consider that even if some of them are not directly usable to identify a cause-effect chain in the interactions of agroecological practices with the economic, social and environmental aspects, they can be useful for comparing the different situations among partners and for highlighting critical aspect (critical/thresholds values) to be considered in the future action plans and for the implementation of EU agri-environmental measures.
Because of the practical and programming aims of the project, we have to describe complex situations with a limited number of indicators that can be easily used by PP. Probably they should be subjected to a re-evaluation by PP after a first round of their application on the basis of their feasibility.
Indicators should be seen as a shared way for collecting information for further discussion on the different themes and an ongoing learning process among partners and stakeholders.

"Indicators help to understand and to interpret a complex system by:
1) synthesizing data;
2) shoving the current state;
3) demonstrating the achievement or not of objectives;
4) communicating the current status to users for management decision" (Mitchel et all. 1995)

Some of the sub-indicators are quantitative/analytics and others sub-indicators are qualitative. For the qualitative ones we should use common scores: (1) Very low; (2) Low; (3) Medium; (4) High; (5) Very high and we could also identify a trend: ↑ Upward trend; → No change; ↓ Downward trend; ↗ slow/some increase; ↘ slow/some decrease.
The indicator (theme) is always qualitative and should represent the degree of achievement of the agroecological optimum on a scale from 0 to 10 for each theme.
The indicators are means of communication: they should be clearly presented to the stakeholders and be readily understood.
The global assessment for the agroecological transition of the pilot area should be formed by the analysis of all indicators, giving a proper relative weight to the specific theme indicator. The global assessment of the pilot area should be performed with participative methods and instruments.

Data source: monitoring systems, remote sensing, ground observations, GIS data/maps/models, soil and water sampling, agricultural and household/ farm survey; labour force survey, administrative data.
Data features to consider: availability, reliability, coverage, temporal and spatial variation.

INDICATORS	
Agri-Environment	
Theme	**Sub-Indicators**
1. Soil health The environmental sustainability of viticulture strongly relies on the maintenance of good soil quality, particularly in terms of physical structure, resource availability and biological activity. The 10 main threats to soil functions (FAO Intergovernmental Technical Panel on Soils - ITPS) are: soil erosion; soil organic carbon losses; nutrient imbalance; acidification; contamination (fertilizer pollution risk); waterlogging; compaction; soil sealing; salinization; loss of soil biodiversity. Proposed sub-indicators are the minimum data set needed to measure or characterize soil quality. Sub-indicators can be assessed by qualitative and/or quantitative techniques. The sub-indicators are used to assess management-induced changes in the soil and to link existing resource concerns to agroecological land management practices. **See:** Soil4Wine decision support tool **www.soil4wine.eu**	(At field level /mean farm value) soil structure soil organic matter soil erosion (level 0-5) soil depth soil compaction electrical conductivity (EC) soil pH Extractable nitrogen (N), phosphorus (P), and potassium (K) Water holding capacity; infiltration and bulk density Microbial biomass carbon (C) and N Potentially mineralizable N Cation Exchange Capacity, sulfate, calcium, magnesium, zinc, copper; aluminium; boron. Soil pollution, analysis of heavy metals like as As, Cd, Cr, Cu, Hg, Pb, Zn, Sb. Co, and Ni
2. Water use Efficiency The water intensity of crop production is defined as the total volume of water input (irrigation, rainfall and soil moisture; measured in cubic meters/ha (m^3/ha) or mm. The sub-indicators should supports the assessment of the pressure of crop production on water resources and the sustainability of resource use in crop production. The water use efficiency as output per unit of irrigation supply has to consider the source of irrigation water: - from surface fresh water sources - from groundwater fresh sources - from non-freshwater sources, including treated saline, brackish or reclaimed water. The total available of soil water that is retained in the soil profile can be evaluated through the soil water balance (SWB) represented by Equation: D * Capital delta SWB / Capital delta t = RR(t) – ETA(t) – SRO(t) – DP(t) (1) where D (in millimetres) is the depth of the modelled soil profile (root zone), and Capital delta_SWB (in cubic metres per cubic metre) is the change of the water volume over an area with depth D	• Moisture content of the soil and soil water capacity • Rainfall: mm (Weather conditions). • Measurement Irrigation volumes: for each irrigation treatment. • Type of irrigation method: drip, sprinkler, flood or furrow irrigation; • Farm delivery system efficiency: water to the plant/water taken from the source $$\text{water use efficiency} = \frac{\text{yield}}{W} = \frac{\text{biomass}}{E + T + \text{losses}} \times HI,$$ where, W is the global amount of water available (natural rainfall and irrigation), T = transpiration, E = evaporation, losses = amount of water lost at any level of the process, HI = harvest index. As it is difficult to separate E and T components, they are usually included in the term ET. • Water resource: surface, groundwater, rainfall, brackish water, natural or artificial reservoir. • Variation in water availability • Conflicts among water users $$\text{Output per unit irrigation supply } \left(\frac{\$}{m^3}\right) = \frac{\text{Production}}{\text{Diverted irrigation supply}}$$ $$\text{Output per unit water consumed } \left(\frac{\$}{m^3}\right) = \frac{\text{Production}}{\text{Volume of water consumed by evapotranspiration}}$$

between two consecutive steps (Capital delta_t). RR (in millimetres per day) is the amount of precipitation at the surface, ETA (in millimetres per day) is the actual evapotranspiration, SRO (in millimetres per day) is the surface runoff and DP (in millimetres per day) is the deep percolation. In addition to climate data, the equation takes account of other parameters such as, land cover, phenological phases, and hydrological soil properties. At field scale, the evapotranspiration (ET), may be estimated as: ET = P + I + G ± Q - ΔS where, P is precipitation, I is irrigation, G is net groundwater flow, Q is run-on or runoff and ΔS is change in soil water content within the root zone, all measured in millimetres of water. Evapotranspiration of crops is normally estimated from more easily measured climatic variables and the predetermined crop-coefficients (Allen et al., 1998). Water productivity (kg/m^3) = Agricultural benefit (kg/ha)/Water use (m^3/ha; 1 mm = 10 m^3/ha)	
3. Pesticide risk Correct management of pesticides (insecticides, fungicides, herbicides) in order to safeguard the health and the environment.	- Average treatment frequency index (TFI): is calculated by the theoretical number of pesticide treatments per hectare, based on standard dose rates of active ingredients, and the amount of pesticides sold yearly; the TFI does not account for the chemical or toxic properties of some specific substances of the pesticide - Pesticide indicators: persistence, risk for groundwater contamination, risk for surface water contamination, volatilization risk (air) - Management practices: 1. Adherence to label recommendations for pesticide application and decision to apply pesticides based on: • Experience, Calendar, Agronomist advise, Observation of populations in traps, Decision Support System, Central Directives of the Ministry of Agriculture • Use of Functional Agrobiodiversity (Flower strips) • Active measures to conserve and increase populations and biodiversity of natural beneficial • insects and animals (Provide and increase biodiversity of plants that act as their hosts) • Use of Biological Control Agents • Use of allelopathic plants, repellent and attractive plants and/or Push and pull strategies 2. Adopt any of the above good agricultura practices adjust planting time, mixed cropping or inter-cropping,crop rotations that favour natural enemies of pests and increase the resilience of cultivation. 3. Perform biological pest control or use biopesticides 4. Use of pest resistant/tolerant cultivars, and standard/certified seed and planting material 5. Systematic removal of plant parts attacked by pests 6. Maintenance and cleansing of spray equipment after use and safe disposal of waste (cartons, bottles, bags) 7. Use one pesticide no more than two times or in mixture in a

	season to avoid pesticide resistance. 8. Perform treatments in the necessary period (in relation to weather conditions and in relation to the presence of the disease) and with the proper pesticides
4. Fertilizer pollution risk The management of plant nutrients addresses two sustainability issues: avoiding pollution, and maintaining a good level of soil fertility	Management of fertilizers Sources of nutrients (mineral; organic) Use of DSS or precision agriculture tools to avoid overfertilizing Measures to prevent fertilizers leaching into the groundwater and or nearby bodies of water
5. Management regime Can show different effects on the agro-ecosystem, in organic or biodynamic farm should be more soil organic matter and more biodiversity. This is due to a more conscious management of the vineyard.	(number of farms – number of ha for each management regime) Biodynamic (5), Organic (4), In transition to organic (3), Conventional with best practices (2) Conventional (1)
6. Biodiversity	Use of agro-biodiversity-supportive practices (list) Flora and fauna Number of different crop/cultivation: Ecosystem Diversity-Ecosystem enhancing Practices Species Diversity- Intercropping, Diverse Crop rotations, Agroforestry, Polyculture vs Monoculture Use of cover crops, green manure plants etc Genetic Diversity, Wild genetic diversity enhancing practices Use of locally adapted varieties/Breeds, Landraces In situ conservation of local species Farming activity increases or decreases biodiversity? Number of different land-use/landscape elements Deforestation (landscape unit level)
7. Ecological connectivity	Refuge for migratory species Habitat for fauna Habitat for flora Presence of buffer zones (connection with 6. and 24.)
8. Protected areas	Quantitative: Number / hectares Qualitative: (5) Protected areas cover key resources and are well-connected with ecological corridors. (4) Protected areas cover key resources. (3) Protected areas are small and don't cover key resources. (2) Protected areas are very small and fragmented. (1) No protected areas
9. Carbon footprint Evaluate only the direct emissions/sequestrations of greenhouse gases (CO_2; CH_4; N_2O) for the cultivation of one hectare of vine for one year (system boundary "from cradle to gate"). Divide viticulture practices into the following categories: Application of fertilizers and manures Irrigation Canopy management Harvest Pest and disease management Soil maintenance Trellis management and maintenance Winter pruning	Carbon storage (soil, biomass) carbon sequestration, (wood structures) GHG, greenhouse gas emissions List of the mechanical equipment of the farm (tractors, weeders etc.) and their horsepower and fuel consumption and hours they operate (quantification of CO2 emission)

Transport farm - plot. The assessment can be made for each phase using data collected on the farm: number of sub-operations, types of tools used, power of the engines, types and quantities of inputs applied; quantities of biomass carbon sequestration; Non permanent vine growth (grape production; Emissions of GHG other than CO2 related to the use and degradation of biomass. Permanent and incremental stock of carbon due to vineyard and soil management years amortisation quota calculated according to the expected lifetime of the vineyards: Carbon sink of vine wood structures Land use change (conversion to a vineyard)	
10. Resilience Absorptive, anticipatory and adaptive capacities of the farming system that allows farms to deal with shocks and stresses, to persist and to continue to be well functioning providing stability, predictable rules, security and other benefits to its members.	Risk mitigation mechanisms Diversification of farming systems
Economic	
11. Land productivity Is a measure of agricultural value of outputs obtained on a given area of land. (farm level – pilot area level)	Farm output value per hectare (Yield - crop and livestock; quantity multiplied by prices). Territorial output value per hectare
12. Profitability Economic viability of the farm	Net farm income (average of the pilot farms) Net farm income (average of the pilot area) Trend of the last five years (each farm; pilot area)
13. Vine health	Longevity of the vineyard
14. Value chains	Transportation Storage, Processing, Distribution and marketing (Access to the commercial market, Use of Short Food Supply Chains)
15. Externalities Take into account only the direct externalities (+/-) of agriculture. - non-tradable by-products of agriculture - damage restoration costs (purification costs, damage to roads from soil erosion, water over-use - replacement cost method) multifunctional value added (“willingness to pay” approach WTP)	negative externalities (list /trend) positive externalities (list/trend)
Social	
16. Right employment	Wage rate in agriculture Level of out-migration

	Level of in-migration (for permanent or seasonal work) Labour rights, employment relations, child labour, workplace safety, health coverage and access to medical care, total employment in viticulture, women's employment in viticulture, youth employment in viticulture.
17. Land tenure Since agricultural land is a key input for agricultural production, having secure rights over land ensures that the agricultural holding controls such a key asset and does not risk losing the land used by the holding for farming. According Ostrom (2009) consider the following aspects: (1) access – the right to enter a specified property, (2) withdrawal – the right to harvest specific products from a resource, (3) management – the right to transform the resource and regulate internal use patterns, (4) exclusion – the right to decide who will have access, withdrawal, or management rights, and (5) alienation – the right to lease or sell any of the other four rights.	Secure tenure rights to land
18. Food security Regards the access to adequate food at the household level, the value is given through the answer to 8 questions The set of eight questions compose a scale that covers a range of severity of food insecurity: mild, moderate, severe. Note: we have to evaluate if it is important for our situation	Food Insecurity Experience Scale (FIES) 1. You were worried you would not have enough food to eat? 2. You were unable to eat healthy and nutritious food? 3. You ate only a few kinds of foods? 4. You had to skip a meal? 5. You ate less than you thought you should? 6. Your household ran out of food? 7. You were hungry but did not eat? 8. You went without eating for a whole day?
19. Knowledge, learning and innovation	Farmers education level Presence of research institutes Extension service / technical assistance Capacity development of the farmer and the workers, safety and health training
20. Social equity	Gender inequality and social exclusion (5) all genders and social groups are involved in decision-making and communication with outsiders, and have the same access to resources and opportunities. (4) all genders and social groups are involved in decision-making and communication with outsiders, and have access to resources and opportunities, but some less than others. (3) specific gender or social groups are partially or occasionally involved in decision-making and have limited access to resources and opportunities. (2) specific gender or social groups are rarely involved in decision-making and have limited access to resources and opportunities. (1) specific gender or social groups are not involved in decision-making and have no access to resources and opportunities. -Non-discrimination, support to vulnerable people
21. Social capital (cooperation between farmers and other	Forms of cooperation in the viticulture farming system Presence of associations dealing with sustainability issues,

stakeholders; capacity to act and plan and to produce social learning;)	natural resource management and local cultural heritage. Community clubs and groups. Interdependency among stakeholders/actors: - synergies;- trade-offs and negotiations; level of cooperation. Trust among stakeholders, reciprocity among stakeholders.
22. Happy neighbours	Communications among neighbours, Conflicts for land use, Satisfaction with relationships among neighbours.
23. Effects on territory	Financial return and viability Fair trading practices, sustainability and environmentally conscious practices, recognition and protection of indigenous knowledge, investment in local community development.
Landscape Cultural Heritage	
24. Aesthetic Landscapes and Ecology	Opportunity for walking Agritourism Visitation to vineyards Climate Mitigation
25. The architectural heritage and local production	Winescape: spatial structure of vineyard architecture (linear or dispersed vineyard architecture %) Presence of buildings with traditional wine architecture: number of preserved buildings Loss of traditional architectural heritage: changes of traditional wine buildings (function and purpose) % Presence of new construction for wine production (n.) Building materials (%): wood; stone; clay; bricks, others; a combination thereof Presence of drywalls (%, meters, km)
26. Land cover type and area (ha; % on total pilot area; Number) See: https://land.copernicus.eu/pan-european/corine-land-cover/clc2018 .	Artificial areas; (ha, %) (anthropogenic/transformed /built areas) Agricultural area not vineyard; (ha, %) a) extensive agriculture; b) intensive agriculture Vineyard area; (ha, %) Natural areas; (ha, %) consider a) virgin nature b) semi-natural system Water; (ha, %) Landmarks: Disturbing elements; (N) Attractive elements; (N)
27. Landscape structure	Landscape diversity, mosaics, connectivity and fragmentation (5) Heterogeneous landscape consists of diverse land-use types and well-connected ecosystem patches. (4) Landscape mosaic consists of several land-use types and some ecosystem patches. (3) Landscape consists of several land-use types and fragmented ecosystem patches. (2) Landscape consists of two or three land-use types and few ecosystem patches. (1) No heterogeneity, i.e. one type of land-use predominates in the landscape.
28. Infrastructures	Assess the spatial importance of the infrastructures on the pilot area (0-5)

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ANNEX 1: BEST PRACTICES

ECOVINEGOALS QUESTIONNAIRE FOR FARMERS:

Date of the interview:	Name of the interviewer:	Organization:
SECTION 1: Farm general Information		
Name of the interviewed: Position in the fare:	Farm name:	Type of farm management': IDSDCD
Address:	City:	Zip code:	Region: State:
VAT N.:	Phone:	E-mail:
Farmer's experience (years):	Educational level of the farmer: ❑None ❑elementary school ❑middle school ❑professional school ❑high school ❑university ❑other	Age of the farmer: years old Gender: M❑ F❑ Current total number of people working on farm:_____persons, of whom: family worker s_____;employees_____; seasonal employed_____
TOTAL FARM AREA (FA) [2]: ha_____	Utilised agricultural area (UAA) [3]: ha_____	[4] Natural area: ha__ Semi natural area and pasture: ha _____ Artificial area: ha_____
The size of your farm is big enough for your needs?	Yes ❑ No ❑	Why?
Geographical reference (DMS)	Latitude:	Longitude:	Altitude (AMSL):

SECTION 2: Crop data			
Crop (species) [5]	Variety (indicate if is an international, local or resistant/PIWI variety)	Hectares (ha)	Crop yield (t)

Animal husbandry [6]: Yes ❑ No ❑	Species:	Breeds:	N. of heads	Livestock Unit (LSU)

SECTION 3: Farming Management					
Conventional ❑	Integrated **(IPM)** ❑	Organic ❑	Biodinamic ❑	Mixed ❑	Other:

How many Landscape Units (LU) do you recognise in your farm[7]? _____ _____ _____ _____ _____	List the Landscape Unit (LU), assign a code, a name, a short description and the category of the slope (1. 0-10% flat; 2. 11-30% moderated; 3. 31-50% steep; 4. > 50% very steep); exposure: N, NE, E, SE, S, SW, W, NW
LU CODE 1_____ 2_____ 3_____ 4_____ 5_____ 6_____ 7_____ 8_____ 9_____	LU: short description, categories of slope and exposure _____ _____ _____ _____ _____ _____ _____ _____ _____

Soil Fertility Management interviewer note [6]:	LU CODE	Difference for each Landscape units (LU)

What are your soil types? [9]	LU CODE	Difference for each Landscape units (LU)

What are your soil/nutrient deficiencies?	LU CODE	Difference for each Landscape units (LU)

Organic matter (level) LU 10	Very low 0-1%; low 1-1,8%, medium 1,8-2,5%; high 2,5- 3,5% very high >3,5%					
Do you have soil erosion problems? DYES ❑N0 [11]	.					
Weeds control [12]	Permanent crops					
	Arable crops					
	Others					

Pest and disease management for vineyards	Var.	n. of treatments per year	The major disease	The most used product (active substance)

Pest and Disease (for each of the following vine parasites indicates the degree of damage in a typical year (I none, 5 a lot of damage)	1	2	3	4	5
Plasmopara viticola					
Erysiphe necator					
Botrytis cinerea					
Guignardia bidwellii					
Lobesia botrana					
Empoasca vitis					
Planococcus ficus					
Halyomorpha halys					
Metcalfa pruinosa					
Thrips tabaci/Frankliniella sp					
Candidatus Phytoplasma vitis					
Xylella fastidiosa					
Does farm produce energy?	❑YES ❑NOT (if YES) indicate which kind produce: ❑Solar power energy ❑biogas/biomass❑wind power❑other_____ ❑directly engaged in the farm ❑entered into the regional/local network				
Irrigation management	YES ❑NO				
Source of water:	well	river	pond/lake	spring	municipal	irrigation district	other (specify)
Water quality problems (salinization-ECw-, pollution, scarcity)							
Type of irrigation [13]	drip	flood	furrow	sprinkler	other (specify)	pumping or free fall system

Irrigation management

SECTION 4: land setting, hydraulic arrangements, terracing rural road network					
Describe for each LU the type of land setting, the hydrological arrangements, the presence of terracing and the state of the rural roads (accessibility)					
LU	LAND SETTING DESCRIPTION				
SECTION 5: grape production, wine making and market					
Grape utilization	Fresh table grape ❑wine grapes ❑other .				
Wine making	On own farm ❑; Made by other wine makers for my farm ❑; Made by other wine makers and sold by them ❑;				
Products Sales Destination	Directly to consumers ❑; Retailers ❑; wholesalers ❑; Exporters ❑ Processors ❑				
They are multi annual contracts with buyers?	Yes ❑ No ❑ Sometimes ❑				
Do you participate at quality systems?	Yes ❑ No ❑ If yes, please list:_____ _____ _____				
VALUE OF SALES					
	VARIETIES:				
	Wine bottle selling €/ 0,75 l				
	Grape selling €/t				
	Wine selling _____€/t and/or _____€/ l				
Do you use labeling and farm communication strategies?	Yes ❑ No ❑ (if YES) which is the attractive element of the label? _____ _____ _____ Other communication strategies of your farm: _____ _____ _____				
SECTION 6: BEST PRACTICES					
Already adopted BEST PRACTICES	Describe				

Interested to adopt BEST PRACTICES [14]	From the EVG BP list

SECTION 7: KNOWLEDGE ON AGROECOLOGY AND ORGANIC FARMING	
Do you know organic regulations?	Yes ❑ No ❑ Very few ❑ Enough ❑
Have you previously applied for organic certification?	Yes ❑ No❑
Do you intend to certify wine/grape as organic in future?	Yes ❑ No❑
Do you know agroecology?	Yes ❑ No ❑ Very few ❑ Enough ❑
Which is the meaning of agroecology: Explain	

SECTION 8: OTHER INFORMATION	
PROJECT AND EXPECTATIONS [15]	Please describe briefly:
PARTICIPATION IN COOPERATIVE, ASSOCIATION, PROGRAMMES	Yes ❑ No❑ If yes, please make a short description:
Do you participate at initiatives with other farmers to solve farming problems (production and marketing problems)?	Yes ❑ No❑ If yes, please make a short description:

Observations and comments of the interviewed:

_____
_____
_____
_____
_____
_____

Observations and comments of the interviewer:

[0]**Position in the farm:** farm owner, employee, partner,

tenant other [l]**Type of farm management:**

l= lndivdual farm

5= Society/Company (e.g: Ltd. Joint stock

Company,...) C=Cooperative o social winery or

winegrower organizations

[2]**Total Farm Area (FA):** is the farm total extension, means the whole area owned by the farmer.

[3] **Utilised Agricutural Area (UAA):** is the total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens used by the holding, regardless of the type of tenure or of whether it is used as a part of common land.

[4] **Natural area** :is a natural habitats and is characterized by species native to the area which regenerate themselves without direct human intervention.

Semi natural area is an ecosystem with most of its processes and biodiversity intact, though altered

by human activity in strength or abundance relative to the natural state and is

characterized by extensive agriculture.

Artificial Area is an urbanized area and it has been changed by human activity, for

example with the buildings.

[5]**Crop species:** manly vines but if if other species are grown, indicate it in the

questionnaire (apple tree potatoes, corn, barley)

[6]**Animal Husbandry:** every kind of animals that are present on the farm

LSU= INDICATE ON QUESTIONNAIRE only for livestock animals, productive meaning

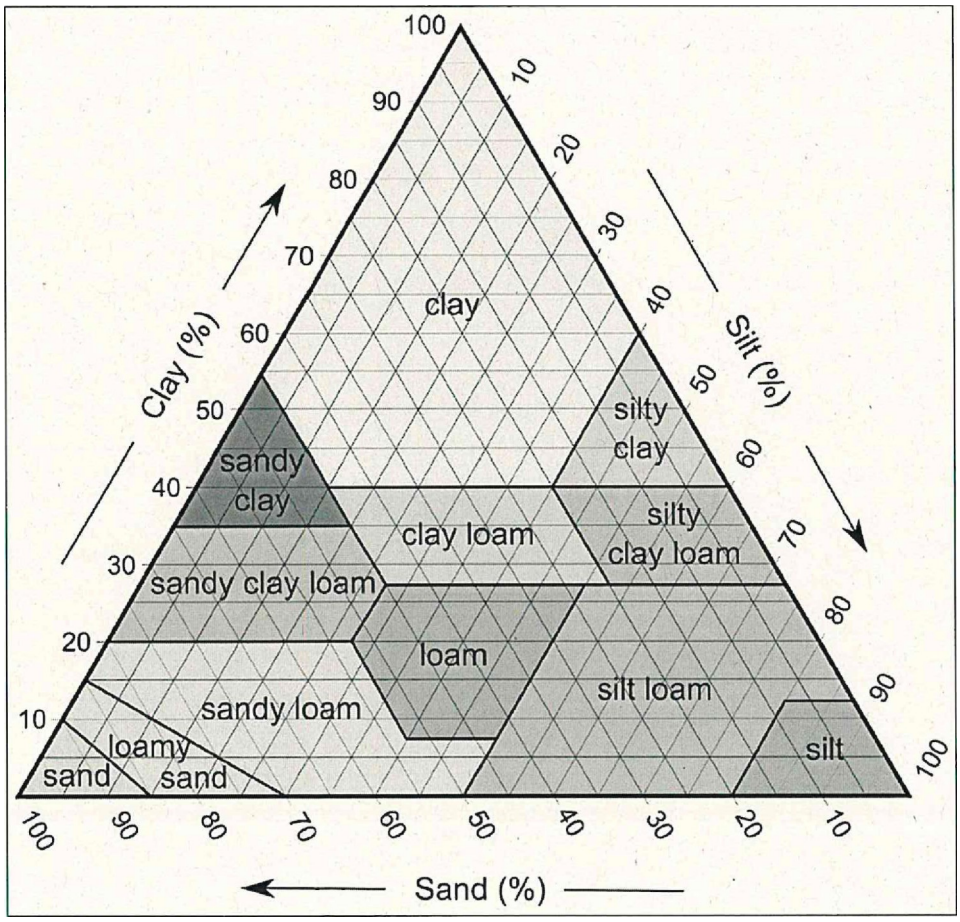
[7]**Landscape Unit (LU):** To be indicated if the farm is not homogeneous = difference areas with presence of intensive cultivation (vineyards, orchards) or livestock, semi-natural, natural areas, the presence of areas with water. If the farm is fragmented, difference into several particles.

Then, give a Code for each LU identified, with this criteria: LU 001, LU 002, LU 003,...

Exposure meaning: N=North, NE=North East, E= East, SE= South East, S= South, SW= South West, W= West, NW=North West

[10] **Soil fertility management:** it referees to fertilization plan adopted at farm level

[9] **Soil types:** Indicate for each LU the type of soil. Indicates the type of soil based on the classes reported by the texture triangle by side.



[10] **Organic matter:** for each LU give organic matter range value.

[11] **Erosion problem:** Explain erosion problem, if you have, that affects farm.
[12] **Weed Control:** chemical, mechanical or other (explain).

[13] **Type of irrigation**: indicate LU CODE under into blank spaces that you find under each type of irrigation system.
[14] **Best Practice**: Report the number that you find on the best practices collection.

[15] **Project and expectations:** Some suggestion: are you going to renew? are you going to switch to organic or other type of management?