Agroecology Europe

OASIS

THE ORIGINAL AGROECOLOGICAL SURVEY INDICATOR SYSTEM

Methodology and guidelines for the assesor.

Agroecology Europe

Brussels, 2023

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OASIS

THE **O**RIGINAL **A**GROECOLOGICAL **S**URVEY **I**NDICATOR **S**YSTEM

Methodology and guidelines for the assesor.

This document is the second of two. It explains the methodology of the indicator system in detail and guides the evaluator on how to assign a value to each criterion, conduct the assessment and interpret the results.

The first document introduces the system of indicators and describes its principles.

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CONTENT

HOW TO USE THE GUIDEBOOK

In this guidebook you will find the full methodology of the OASIS framework needed for farm assessments. Before commencing to study it, please consult 'OASIS, the Original Agroecological Survey Indicator System. A simple and comprehensive system for agroecological transition assessment'[1] brochure, in order to understand the full scope of the framework. The four steps described below corespond to the nine steps mentioned in the brochure.

- **STEP 1: STUDY**

  In the section **GUIDE THROUGH CRITERIA** all criteria are operationalized with: definition and explanation, best practice examples, suggested indicators for evaluation, corresponding interview questions, and interpretation (scale). The surveyor should carefully study the guide before conducting interviews to have a good understanding of the indicators and how they are measured. They should also thoroughly research the context in which they will be using OASIS to properly evaluate the criteria. For three criteria: 2.1.1, 2.1.2 and 5.2.7. it is possible to also evaluate separate indicators, which requires more specific information , such as quantities of inputs or spendings. This step is optional and can be ommited.

- **STEP 2: INTERVIEW**

  The interviews with the farmer should be conducted following the **INTERVIEW PROTOCOL.** All questions for the farmer are formed in a logical sequence and grouped in blocks following the topic they deal with (done to avoid repetition since one question sometimes yields information needed for several indicators or criteria). The criteria that will probably be impacted by the answers received from any question are enumerated with each block of questions, to help with the coding of the interviews. The surveyor should be a good observer and listener. While responding to all questions from the protocol is vital, interviewers should be open to discuss other issues and allow the farmer to have small digressions, if deemed necessary.

- **STEP 3: TRANSCRIPTION AND CALCULATION**

  After all of the necessary information is recorded, the surveyor should, as soon as possible, translate the data into the corresponding values from the scales, inside of the Excel **SPREADSHEET**. All the information (abbreviated criteria names) required for the spreadsheet is listed on the page 99. Average values should then be calculated and radar charts created following the template document provided.

- **STEP 4: REPORT**

  Besides the Excel spreadsheet, there is a template for the **FARM PORTRAIT,** which is designed to provide qualitative information alongside the radar charts.

GUIDE THROUGH OASIS CRITERIA

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1 AGROECOLOGICAL FARMING PRACTICES

1.1 NATURAL RESOURCES AND AGROFORESTRY

1.1.1 Use of agroecological soil tillage techniques

DEFINITION

Tillage is the physical loosening of the soil via mechanical agitation of various types, such as harrowing, digging, stirring, and ploughing, with the objective of optimizing conditions for seed germination, establishment, crop growth, and weed and pest control[2]. Negative impacts associated with the use of conventional tillage systems include increased loss of soil organic matter and carbon emissions, soil structure destruction and erosion, high energy use, leaching and runoff of agricultural chemicals, and decreased abundance and richness of soil biota[3].

Conservation tillage (CT) is an agronomic practice that includes reduced or minimum tillage, ridge tillage, strip or zonal tillage, mulch tillage, and no-till practices. It excludes any conventional tillage operations that invert the soil and bury crop residues[2]. Conversion to CT, when done right, has been proven to bring benefits such as increasing soil organic carbon, minimizing soil erosion risks, improving soil structure, conserving soil moisture, enhancing soil quality, and decreasing fluctuations in soil temperature[4]. However, there are some differences in effects within different climates[5,6], which should be taken into account.

GOOD EXAMPLES

In agroecological systems, conservation tillage is coupled with permanent organic soil cover (cover crops in main crops or between two main crops, and well-designed crop rotations) to suppress weeds without using herbicides. In reduced tillage systems, the soil is disturbed minimally (no more than 3-5 cm deep) and with no inversion (soil 'cracking' up to 25 cm is allowed to de-compact the soil), whereas in a no-till system the crop is seeded directly into a mulch or living crop (which is usually mown, rolled or tarped prior to seed), without any soil disturbance preceding[7].

INDICATORS

Type of soil tillage technique, number of times soil is disturbed per year, and tillage depth in cm.

INTERVIEW QUESTIONS

- Do you till the soil?
- Using what machines (the farmer should enumerate all the machines and

processes used)?

- Do you know how deep you go when tilling – if yes, how deep?
- Using what speed?
- How often do you work the soil per year?
- Is it the same in all plots or do some have different management?

SCALE		
	1	deep ploughing (more than 30 cm in depth) or rotavating several times per year
	2	rotavating or deep ploughing once a year
	3	ploughing maximum 30 cm in depth and/or using power harrow once a year
	4	reduced tillage up to 5 cm (e.g., superficial disc-harrowing, wide-cutter or rotary hoe), strip tillage, ridge tillage
	5	no-till

1.1.2 Agroecological soil fertility management

DEFINITION

Soil fertility refers to the ability of the soil to support and sustain plant growth, including through making N, P and other nutrients available for plant uptake and by providing favourable chemical, biological, and physical habitat for plant growth[8]. When restoring organic matter and nutrient content to the soil is disregarded, the nutrient cycles are broken and soil fertility declines[9]. In general, the supporting, provisioning, and regulating ecosystem services provided by the soil should be maintained or enhanced[10]. Agroecological fertility management is hence based on enhancing the process of recycling biomass to optimize organic matter decomposition and nutrient cycling over time, by managing soil organic matter and enhancing soil biological activity.

GOOD EXAMPLES

Using organic manure, pulses in crop rotation, mixtures of legume-based green manure, legume-based temporary grasslands in crop rotations, recycled crop waste, wood chips (or ramial wood chip (RWC)), organic agro-industrial waste, biochar, etc. is very important, as well as regular physical, biological, and chemical soil diagnostics.

INDICATORS

The nature and extent of agroecological fertility management practices used, both in time and space, as well as any synthetic fertilizers.

INTERVIEW QUESTIONS

- What processes do you use to enhance fertility in your fields?
- Are any of the following methods used: legume-based temporary grassland in crop

rotation, pulses in crop rotation, complex mixtures of legume-based green manure, organic manure (surface composting), heap composting, Bokashi, companion plants sown in the main crop, recycling crop waste, Ramial Wood Chip (RWC) or other wood chips, organic agro-industrial waste, biochar, or any other methods?

SCALE		
	1	no agroecological practices used (the fertility management is completely based on synthetic fertilizers)
	2	rarely used practice and/or only in a small part of the farm (up to 30% of used farmed land)
	3	moderate use of practice and/or in up to one half of the farmed land
	4	often used practice and/or in 75% of the farmland, several strategies implemented
	5	several strategies are implemented and there are no (or almost no) use of synthetic fertilizers

1.1.3 Agroecological crop pest management

DEFINITION

Crop pest management refers to the practices that control the negative effects of different animal pest species and their abundance in the agroecosystem[11]. Rather than using pesticides, agroecological pest management should be based on a long-term strategy of incorporating preventative ecological measures that keep organisms from reaching 'pest status' via crop diversification, while maintaining or creating habitats to attract indigenous beneficial fauna (natural enemies of crop pests) and/or repel pest fauna[12].

GOOD EXAMPLES

The use of conservation biological control methods (manipulation of the natural environment in order to maintain and enhance the reproduction, survival, and efficacy of native natural enemies i.e. predators, parasitoids, and pathogens of pests[13]) such as implementing dense ecological networks designed to provide habitat and food for the natural enemies of the pest in question; using polycultures with push-pull crops[14]; planting species and cultivars tolerant or resistant to crop pests, and other cultural practices such as balanced fertilisation, intercropping*, cultivar mixtures, long and diverse crop rotation that prevent pest proliferation, etc. Sampling and monitoring for pests and their natural enemies is an important job that requires on-going dedication.

* *Intercropping is the cultivation of two or more crops simultaneously on the same field. There are several types of intercropping, according to the degree of spatial and temporal overlap of the crops: mixed intercropping in which the component crops are totally mixed; row cropping where crops are arranged in alternate rows; strip intercropping, where several rows of a plant species*

are alternated with several rows of another plant species; temporal intercropping that combines a fast-growing crop with a slow-growing crop, and the fast-growing crop is harvested before the slow-growing crop starts to mature; relay cropping where the second crop is sown during the growth of the first crop, so that the first crop is harvested to make room for the full development of the second.

INDICATORS

The use of chemical pesticides compared to the local IPM recommendations (according to the crop), presence of a diverse crop rotation and diversity of crops; presence, quantity and quality of ecological networks; use of other agroecological pest management practices listed above.

INTERVIEW QUESTIONS

- Do you have problems with crop pests?
- Which pests present the biggest problem?
- How do you deal with them?
- Is there any ecological network structure designed for pest management on your farm (e.g., flower strips or hedgerows)?

SCALE

1	use of more than 30% more of chemical pesticides than is recommended by the local IPM recommendations
2	IPM (moderate use of pesticides, some biological control agents) or use of broad-spectrum organic pesticides (e.g., Spinosad)
3	the primary strategy is the use of biological pesticides (target-specific plant extracts) or commercial natural enemies of pest organisms
4	a mixed management with some ecological networks and use of commercial biological pesticides
5	no use of insecticides, well designed and managed ecological networks supporting natural enemies of pest organisms, diversified crop rotations, and the use of resistant/tolerant plant species

1.1.4 Agroecological crop disease management

DEFINITION

Crop disease management refers to the prevention and suppression of the occurrence of plant disease by preventing the disease-causing pathogens to appear or by inhibiting their growth. The degree of suppression is linked to the soil management, physical condition of the soil, fertility level, biodiversity, and populations of soil organisms[15]. Instead of using fungicides, fumigants, nematicides, and bactericides, agroecological crop disease management techniques primarily rely on enhancing the soil microbial life, as it has been proven that a more complex soil community promotes greater ecological stability[16-18].

GOOD EXAMPLES	Soil fertility management with complex mixtures of green manures, compost, farmyard manure, compost tea, etc.; long and well-designed crop rotations; mulching; drip irrigation; and removal of diseased plants. Selecting appropriate sites for planting, and resistant or tolerant varieties of crops are critical, as well as regular sampling and monitoring for disease symptoms.
INDICATORS	Presence of crop diseases, use of fungicides compared to the local IPM recommendations (according to the crop), (excessive) use of chemical fertilizers, use of soil solarisation, type of soil tillage technique, use of copper and/or sulphate, extent of implementation of agroecological practices supporting disease management (see above). Regular monitoring and sampling for disease symptoms.
INTERVIEW QUESTIONS	• Do you have problems with crop diseases? • What represents the biggest problem? • How do you deal with it (see answers from 1.3 as well, if applicable)? • Do you use copper sulphate, soil solarisation, efficient microorganisms? • If yes, how often?

SCALE	**1**	use of more than 30% of chemical fungicides than recommended by the local IPM recommendations; copper sulphate applied more than 5 times per year; and/or deep and frequent tillage, excessive nitrogen application and/or regular use of soil solarisation. There is no clear prevention strategy
	2	IPM (moderate use of fungicides), occasional use of soil solarisation or copper sulphate applied up to 5 times per year
	3	use of commercial biological control agents, efficient microorganisms and some fungicides, rare use of soil solarisation or applying copper sulphate up to 3 times per year
	4	mixed management with various supporting practices - e.g., conservation tillage, agroecological soil fertility management (well-designed crop rotation, mulching, compost tea), intercropping, choice of resistant crop species and cultivars, no use of soil solarisation, implemented with occasional use of commercial biological control agents (BCAs) and efficient microorganism
	5	no use of fungicides or commercial BCAs and efficient microorganisms, well-established use of best practices for disease prevention and soil health* enhancement, no use of synthetic fertilizers

** Soil health is defined as "the capacity of soil to function as a vital living system to sustain biological productivity, maintain environmental quality, and promote plant, animal, and human health"[18].*

1.1.5 Agroecological weed management

DEFINITION

A weed is a spontaneous flora that interferes with human objectives for crop production and the management of the agroecosystem[19]. Agroecological weed management is primarily based on understanding weed biology and ecology, and using predominantly preventive and cultural biological measures, rather than direct mechanical ones, and positioning chemical measures as the least desirable option due to their effects on weed resistance, and due to the negative effects of chemical residues on human and soil health. Farmers can also use weeds as bioindicators of soil health and determine their soil management plan according to the weed populations present in the fields.

GOOD EXAMPLES

Choosing competitive crop genotypes, appropriate sowing/planting patterns, long crop rotations, temporary grassland in crop rotations, simple crop mixtures (e.g., cereal and pulse) and intercropping in general, complex mixtures of green manures (cover crops), main crop sown in green manure mulch, permanent soil cover with companion species of the main crop(s), using allelopathic crops, etc. Regular observation of weed abundance and richness.

INDICATORS

Use of herbicides compared to the local IPM recommendations according to the crop in question, use of mechanical weeding, use of flame weeding, use of bioherbicides, extent of use of agroecological practices supporting weed management (see above).

INTERVIEW QUESTIONS

- (If applicable) Does the farm engage in crop rotations?
- Is there one or several of types of crop rotations?
- Are rotations applied in all fields or only in some?
- How are they set up?
- Do you have problems with weeds?
- How do you deal with them?
- Do you use mechanical weeding?
- Are any of the following methods used:
  long crop rotations, temporary grassland in crop rotations, competitive crop species and cultivars, intercropping, complex mixtures of green manures (cover crops), main crop sown in green manure mulch, permanent soil cover with companion species of the main crops?

SCALE

1 synthetic herbicide used on the whole surface at the total amount of more than 30% than is recommended by the local IPM recommendations

2	use of recommended regional chemical weed management practices and mechanical weeding in the crop and in the period between the two main crops
3	frequent mechanical weeding (more than twice or three times per ha, per year) or frequent flame weeding or use of bioherbicides
4	mixed management using occasional mechanical weeding/ flame weeding/ bioherbicides with some weed management-supporting agroecological practices (e.g., long crop rotation, crop mixtures, temporary grassland) partially implemented
5	no use of herbicides and less than 2 instances of mechanical weeding per crop and per year, well-established use of different weed management-supporting agroecological practices

1.1.6 Maximisation of soil cover

DEFINITION

Cover crops are plants planted to protect the soil from wind and water erosion, from sun UV radiations, temperature fluctuations, nutrient leaching, and to ameliorate soil qualities. They are useful for protecting the soil when it does not have a cash crop, providing an additional source of organic matter to improve soil structure and fertility, recycling nutrients (especially P and K) and mobilizing them for the following crops, and for stimulating soil life. They provide 'biological tillage' by improving soil structure and increase the water percolation capacity of the soil, they can supress weeds and some can even 'catch' leached nutrients (especially nitrogen)[20] or fix nitrogen. The presence of a mulch layer inhibits the evaporation moisture within the soil and leads to increased water in the soil profile. Complex mixtures of green manure stimulate soil symbiotic microorganisms, which in turn provide the crops with many ecosystem services (management of pathogenic microorganisms, synthesis of growth hormones, etc.).

GOOD EXAMPLES

Using permanent soil cover of biological origin (mulch and/or living plants, not including plastic foil mulches) on the whole surface of the arable field or in the inter-row of permanent crops; or implementing cover crops or companion plants in intercropping.

INDICATORS

Average proportion of time (months) that the soil is covered with biological material (living plants or mulch) during one year, from sowing to harvest/destruction.

INTERVIEW QUESTIONS

- What happens after harvest?
- Do you leave the crop residues, compost them, or burn them?
- Do you use cover crops? If so, what kind?
- Do you use mulch or companion plants to cover the soil?
- Are any of the following methods used:
  long crop rotations, temporary grassland in crop rotations, intercropping, complex mixtures of green manure (cover crops), main crop sown in green manure mulch, permanent soil cover with companion species of the main crops, etc.?

SCALE

1	the soil is covered (with plants or biological material) less than 50% of the time (less than 6 months of the year)
2	the soil is covered 50-75% of the time
3	the soil is covered 76-90% of the time
4	the soil is covered 91-95% (around 11 months of the year)
5	the soil is covered more than 95% of the time (more than 11.5 months)

1.1.7 Use of plant reproductive material adapted to low input systems

DEFINITION

Cultivars bred for conventional, high-input agriculture, lack important traits required for agroecological cropping systems. This is primarily due to the selection being carried out in and for systems that use high levels of inorganic fertilizers and synthetic crop protection inputs. Some of the traits (e.g., semi-dwarf genes) that were introduced to address problems that emerged in high-input systems, were shown to have negative side-effects on the performance of cultivars under organic and low-input agronomic conditions[21]. Agroecological systems, on the other hand, require crop genotypes that are able to form active symbiotic relationships with beneficial organisms in the rhizosphere, establish mechanisms that increase nutrient uptake and water-use efficiency (e.g., increased rooting depth), control weeds, and are resistant to pests and diseases[21].

GOOD EXAMPLES

Use of plant reproductive material (seeds, seedlings, plants, cuttings, etc.) that are adapted to local conditions, manage stress factors well, do not require large inputs of fertilizers, pesticides and water, and can be propagated/saved for the following year. This involves peasant/folk seed, cultivars bred in and for organic conditions, heirloom seed, population varieties, and stress-tolerant cultivars and species - such as neglected and underused crops that could be used as an

alternative to winter wheat (e.g., triticale, oats, spelt) or to maize (e.g., sorghum, millet) for instance.

INDICATORS

Proportion of farmland in which plant reproductive material which requires low amounts of inputs (water, synthetic fertilizers and pesticides) is used.

INTERVIEW QUESTIONS

- What kind of seed/seedlings do you use?
- Have you noticed that some of the crops you grow require more water than others to thrive? If so, which ones?
- Have you noticed that some of the crops you grow specifically require frequent and 'heavy' fertilisation to thrive?
- Have you noticed that some of the crops you grow require frequent use of pesticides or herbicides to thrive?

SCALE

1	more than 80% of the plant reproductive material that is used at the farm requires significant amounts of inputs
2	60-79% of the plant reproductive material that is used at the farm requires significant amounts inputs
3	40-59% of the plant reproductive material that is used at the farm requires significant amounts of inputs
4	20-39% of the reproductive plant material that is used at the farm requires significant amounts of inputs
5	less than 20% of the plant reproductive material that is used at the farm requires significant amounts of inputs

1.2 NATURAL RESOURCES AND AGROFORESTRY

1.2.1 High level of animal welfare

DEFINITION

Animal welfare is often presented through the concept of the 'Five Freedoms' - the conditions that must be met to ensure animal's wellbeing and basic needs. These include:

1 the absence of hunger, thirst and malnutrition: the animal must have access to water and food, in appropriate quantity and quality, and corresponding to the needs of their species;

2 the absence of fear and distress: the breeding conditions must not induce psychical suffering;

3 the absence of physical and/or thermal stress: the animal must have a certain physical comfort (including sufficient space for movement);
4 the absence of pain, injury and illness: the animal must not be subjected to treatment that could hurt or injure them, and all must be treated in case of illness;
5 the freedom to express themselves with the normal behaviour of its species: its environment must be adapted to its species (it must be in a group if it is a social species and create conditions where natural reproductive behaviour can be engaged within, for example)[22].

GOOD EXAMPLES

The farmer must respect the national and/or EU regulations concerning animal welfare. All of the livestock species present on the farm must be provided with an environment in which they can express their natural (or near to natural) behaviour in feeding, reproduction, social needs, and preferences[23]. Special attention is given to the following aspects: free-range barns with sufficiently low animal density, where the animals are not continuously attached; access to an outdoor range during the housing period; sufficient parasite and disease management to avoid unnecessary suffering; shelters in the pasture; diversified feeding; and the use of transport and slaughtering techniques that minimize stress and pain.

INDICATORS

Extent of use of measures favourable to animal welfare: conditions in the stables, shelter in paddocks, appropriate feed, presence of parasites and diseases in animals, expression of innate behaviour, life expectancy of non-meat animals, use of humane transportation and slaughtering methods.

INTERVIEW QUESTIONS

- Do your animals live outdoors?
- For how many months of the year do they stay outside?
- Are there shelters in the paddocks?
- *Ask to see the barns – the density shouldn't be too high and the animals should be clean.*
- Are the animals attached (tied-up during the housing period)?
- Do you have problems with animal parasites?
- If so, which represents the biggest problem?
- How do you deal with it?
- Do you have problems with animal diseases?
- If so, which represents the biggest problem?
- How do you deal with it?
- What kind of feed do the animals eat?
- Is the feed routinely checked for mycotoxins?
- How are animals slaughtered? Who does it?
- If they are transported to a slaughtering facility - how is the transport carried out?

SCALE	**1**	very low use of measures favourable to animal welfare - immediate separation of young animals from mothers, regular castration, disbudding, dehorning, beak trimming or tail docking with invasive procedures and without pain relieving drugs, the animals are constantly tied-up during the housing period, the density of animals in the stable is very high, animals frequently suffer from thermal stress (exposure to sun or no air flow), no natural light, insufficient or no bedding, no access to pasture, high presence of injury marks or parasites on animals, the animals are malnourished, short life expectancy for non-meat animals, using transportation and slaughtering methods that cause large stress for the animals
	2	low use of measures favourable to animal welfare - early separation of young animals from mothers, high density of animals, animals are tied most of the time during the housing period or have very restricted movement (cages, stalls), insufficient or no bedding, some natural light in the stalls, frequent issues with certain illnesses or parasites, short life expectancy for non-meat animals, regular castration, disbudding, dehorning, beak trimming or tail docking performed on young animals, with invasive procedures and without pain relieving drugs, using transportation and slaughtering methods that cause stress for the animals
	3	moderate use of measures favourable to animal welfare - early separation of young animals from mothers, castration, disbudding, dehorning, beak trimming or tail docking procedures often performed on young animals with non-invasive procedures but without pain relieving drugs - lesser degree of movement restriction (e.g., cage-free poultry housing), good density of animals, natural light and ventilation in the stalls, sufficient and appropriate bedding, limited access to pasture, small amount of shelter in the pastures, some problems with injuries, parasites or illnesses, regular life expectancy for non-meat animals, using appropriate transportation or slaughtering methods
	4	high use of measures favourable to animal welfare - early separation of young animals from mothers, castration, disbudding, dehorning, no beak trimming or tail docking is sometimes performed on young animals but with non-invasive procedures and always with pain relieving drugs - good density of animals, rare problems with injuries, parasites and illnesses, natural light in the stables, good amount of access to pasture (more than 100 days per year), good level of shelter in the pastures and ventilation in the stables, animals have sufficient water and food, regular life expectancy for non-meat animals, using appropriate transportation or slaughtering methods
	5	very high use of measures favourable to animal welfare - late separation of young animals from mothers, very rare use of disbudding, dehorning, no beak trimming or tail docking, performed only for special cases in

young animals and always using pain relieving drugs, young male castration only if necessary for avoiding mating too young heifers- daily access to pasture, free-range housing, good density of animals, very seldom issues with parasites or diseases, regular (once or twice per year) testing of feed for mycotoxins and coprological examination, full respect of the animal's social behaviour, all measures taken to reduce heat stress (e.g., heated nests for piglets), long life expectancy for non-meat animals, use of most humane slaughtering and transportation methods

1.2.2 Agroecological livestock management

DEFINITION

Livestock management is the practice of the efficient, productive, and ethical caretaking of animals for agricultural purposes. Agroecological livestock management should be based on animals that require low external input use, at the same time respecting the animal's innate behaviour. It encompasses quality of the animal feed, and type of disease and parasite management.

Animals should be fed with grasses, legumes, bushes and trees, not only because they are the most suitable feed, but also because about two thirds of arable land is currently used for feed production, which both creates large conversion losses (half of any crop is 'wasted' in conversion to meat[24,25]) and leads to considerable trade-offs to producing food for direct human consumption[26]. Opting for ruminants that are able to thrive in pasture-based systems, in all seasons and at all growing stages, and monogastrics that feed on grass and food waste, can help to resolve this conflict[23].

GOOD EXAMPLES

The crucial feature of an agroecological livestock management is the choice of livestock breeds and species. Rather than opting for the most productive breeds that require many inputs and are not well-adapted to an efficient conversion of grass and other cellulose-rich feed into milk and meat, the system should be designed with the local geography and climate zone in mind, and the choice of animal type should be determined in function of its ability to adapt to agroecological systems. Animals should require a low level of maintenance (e.g., they can calve naturally in the pasture), low spending for additional feed or drugs, and a priority should be given to dual-purpose breeds. Animal diseases and parasites should be managed by preventive rather than by curative methods – balanced feeding, adequate mineral supplementation, well-designed rotational stocking and mixed stocking, using tannin-rich forage species to manage parasites, proper hygiene, and the isolation of sick animals from the herd in case of infectious disease. When necessary, diseases should be treated with essential oils, plant extracts, or other natural means (e.g., clay, magnesium chloride, vinegar)[23]. Considering feed management: use of cellulose-rich forage; pasture-fed ruminants, good proportion of pasture-based

feed for monogastrics. Preparing hay/silage/haylage for winter feeding. A minimal percentage of concentrated feed should be given to the animals, especially during the finishing period for meat animals, or during the lactating period for dairy animals. Using cereals and pulses from the farm's own production is a transition practice towards a fully developed agroecological system.

INDICATORS

Extent of adoption of agroecological measures in livestock management: percentage of low demanding animals, production level and intensity, ratio of animal product to food-competing feedstuff* used per animal, use of synthetic drugs or preventive natural methods.

** Feed that is not food-competing comes from grasslands or food waste and by-products (e.g. whey, brans, oil cake): "environmental pressures from livestock production could be reduced by focusing on grassland-based ruminant production and by reducing the amount of primary feed-stuffs derived from cropland in both ruminant and monogastric feeding rations".*[26]

INTERVIEW QUESTIONS

- What types of animals do you raise?
- What made you choose these particular breeds (what traits do they have)?
- Do you have any local breeds?
- Do you cross local breeds with other breeds? (Why?)
- Do you have problems with animal parasites?
- Which represent the biggest problem?
- How do you deal with them?
- Do you have problems with animal diseases?
- Which represent the biggest problem?
- How do you deal with them?
- What do you do with the sick animals (e.g., are they isolated, what is the withdrawal period)?
- What kind of feed do the animals eat?
- What is the annual production/animal?
- How much concentrate do you give to the animals?

SCALE

1 the farmer raises only highly productive animals OR uses a very high amount of drugs OR very low quality concentrate-based feed;
e.g., animal product to food-competing feedstuff ratio for dairy cows: M:G (milk to concentrates, grain, grain by-products) is 2.9 or lower
{example of calculation: for a production of 10 000 l of milk/year/cow for 4000 kg grain fed, the M:G ratio is 2.5}

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2 the farmer raises highly productive animals, uses only synthetic drugs following recommendations, uses low-diversity feed with concentrates;
e.g., animal product to food-competing feedstuff ratio for dairy cows: M:G (milk to concentrates, grain, grain by-products) is between 3.0 and 3.3

3	the farmer has some low demanding animals, uses small amounts of synthetic drugs and some natural drugs, implements appropriate measures for hygiene, spacing, and feeding; e.g., animal product to food-competing feedstuff ratio for dairy cows: M:G (milk to concentrates, grain, grain by-products) is between 3.4 and 4.0
4	the farmer mostly raises low demanding animals adapted to the local conditions, uses natural drugs and a good level of preventive methods; e.g., animal product to food-competing feedstuff ratio for dairy cows: M:G (milk to concentrates, grain, grain by-products) is between 4.1 and 5.9
5	the farmer raises low demanding animals adapted to the local conditions and (almost) exclusively uses preventive methods (e.g. ,mixed stocking, use of tannin-rich plants from pastures), very high quality diversified pasture-based feeding; e.g., animal product to food-competing feedstuff ratio for dairy cows: M:G (milk to concentrates, grain, grain by-products) is 6.0 or larger

1.2.3 Agroecological grassland management

DEFINITION

There is a wide variety of grasslands, each with their different potential and limitation and consequently, sets of management techniques. For the European context, the most notable differences are between three different types of grasslands: temporary grasslands, permanent grasslands, and rangelands. In temporary grassland, annual, biennial or perennial forage species are kept for a short period (usually only a few years, 1 to 3), and they are usually regularly resown or integrated into a crop rotation. In permanent grassland the vegetation is composed of perennial or self-seeding annual species which may persist indefinitely, it may include naturalized or cultivated forages. In rangelands, the indigenous vegetation (climax or sub-climax) is predominantly grasses, grass-like plants, forbs or shrubs that are grazed or have the potential to be grazed. Rangelands are usually very extensive and not delimited by fences[27]. Grassland management encompasses the stocking method used (manipulation of how, when, what and how much the animals graze – e.g., rotational stocking, mixed stocking, mob stocking, strip stocking, etc.), type of grazing system (sedentary or transhumance), stocking rate, stay and rest periods, mowing frequency and period, and fertility management (based on legumes or fertilizers).

GOOD EXAMPLES

Optimum stocking management should rely on the following principles: finding a trade-off between forage quantity and quality, adoption of optimum stocking rate for the seasonal grass production, combining requirement of grassland plants with those of grazing livestock, adoption of multifunctional stocking system[23].

INDICATORS

Extent of adoption of agroecological measures in grasslands: stocking management, use and quality of implementation of rotational or extensive grazing, proportion of legumes in the sward, amount of fertilizers used.

Special considerations for different grassland types:
FOR MAINLY CUT (TEMPORARY) GRASSLANDS – the proportion of legumes in the sward, frequency and timing of cutting (grasses just before hearing, legumes so that they flower once per year);
FOR MAINLY GRAZED (PERMANENT) GRASSLANDS – rotational grazing with appropriate stocking rates and rest periods (strip stocking, mob grazing), etc.; mixed stocking, a combination of grazing and cutting of the grassland;
FOR RANGELAND – livestock transhumance, mixed stocking, appropriate stocking rates.

INTERVIEW QUESTIONS

- Do the animals stay outside?
- For how many months do they stay outside per year?
- What is the size of the land that is grazed?
- Do you have a specific system of grazing and stocking?
- How does it work?
- How many paddocks are there and what is the average stocking density per paddock?
- What is the stocking rate on the whole grazed area?
- Do different species graze together? How do you decide when it is time to move to another paddock (*ask to show you the condition of the paddocks*)?
- Do you fertilize the grassland – if yes, is it with synthetic nitrogen or organic manure?
- Do you use grass-legume mixes?
- What is the average percentage of legumes in the sward?
- How often and when is the grass cut (if it is cut)?
- Do your animals receive additional hay, haylage or silage during the grazing period?

SCALE

1	generally very low use of agroecological grassland management measures (e.g., strong use of nitrogen fertilizers, no legumes in the grazed land, overgrazing) OR very low use in at least 80% of the land
2	generally low use of agroecological grassland management measures OR very low use in 60-80% of the land
3	moderate use of agroecological grassland management measures
4	high use of agroecological grassland management measures – OR very high use in 60-80% of the used land
5	very high use of agroecological grassland management measures

(e.g., rotational mob grazing with appropriate rest periods, a good proportion of legumes, no additional synthetic fertilizer use, etc.), in most of the land (over 80%)

1.3 NATURAL RESOURCES AND AGROFORESTRY

1.3.1 Efficient water management

DEFINITION

"Irrigation of agricultural land accounts for about four fifths of the total freshwater consumed and about two thirds of the total diverted for human uses."[28] Water being one of the most critical resources for (sustainable) agriculture, and especially considering the prospects of future variability and unpredictability of climatic events, it is important to implement different techniques that conserve water and increase irrigation efficiency. Efficient water management should encompass using water supply efficiently, reducing operating costs, reducing the impacts of droughts, reducing drainage and erosion control problems, sustaining crop yields and quality, and improving water quality and aquatic habitat[29].

GOOD EXAMPLES

Some techniques that conserve water resources are: using drought-tolerant crops, dryland farming, using drip irrigation, proper irrigation scheduling (e.g., irrigating at night), collection of rainwater, recycling of greywater, buried clay pot irrigation in market gardening.

INDICATORS

Extent of adoption of water conservation practices and percentage of the farmland surface where such practices are applied.

INTERVIEW QUESTIONS

- Do you conserve water (rainwater, recycling greywater)?
- Do your local conditions require you to do so?
- What kind of irrigation system do you use?
- When do you irrigate (is there an optimal management of water quantities and a schedule you follow)?
- How much do you irrigate?
- How do you choose the crops you will plant (drought resilience, competition, or purely market factors)?

SCALE

1 no implementation of techniques, practices and strategies for conserving water, noticeable inefficient water use in the farm

2	water conservation practices used rarely and/or only in a small part of the farm (up to 30% of the farmed land (on land where applicable)
3	moderate use of water conservation practices, in 31-50% of the farmed land
4	water conservation practices often used and/or in 51-75% of the farmed land
5	water conservation practices very often used and in almost all parts of the farmed land (>75%).

1.3.2 Favourable microclimate management

DEFINITION

The local microclimate determines the moisture available in the soil and in the air, the presence of dew and frost, the temperatures for plant growth and germination, which affects the vigour of soil biota, the capacity to fix nitrogen, and the occurrence of pests and diseases.

GOOD EXAMPLES

Some examples of microclimate management techniques are surface ponds and micro-dams, stone bunds, terraces, fog collection, infiltration trenches, ponds, and wells; alley cropping, contour lines/keyline design, hedges, hedge-row networks, windbreaks, use of shading trees, etc.

INDICATORS

Extent of use of techniques that enhance favourable microclimate.

INTERVIEW QUESTIONS

- Have you implemented ponds, terraces, swales, contour lines, windbreaks into the farm; or in some other way altered the natural environment to enhance the microclimate?

SCALE

1	not used at all
2	rarely used and/or only in a small part of the farm (up to 10% of the farmed land)
3	moderate use, in up to 30% of the farmed land
4	often used, two or three types of microclimate management techniques, up to 50% of the farmed land
5	very often used and in more than 50% of the farmed land, more than three different techniques for microclimate management

1.3.3 High level of adoption of agroforestry

DEFINITION

Agroforestry is a system where both trees and agricultural crops or livestock are grown on the same piece of land. Agroforestry systems are designed to protect, conserve, diversify and sustain vital economic, environmental, human, and natural resources. Agroforestry differs from traditional forestry and agriculture by its focus on the interactions amongst components, rather than just on the individual components themselves [30].

GOOD EXAMPLES

Trees and other woody species can produce fruit, timber, firewood, forage, etc. Hedges, wooded strips, and tree lines are typical elements of agroforestry systems. Traditional European agroforestry systems include the 'bocage' (hedgerow network) in livestock breeding regions, grazed traditional orchards, pollard tree rows, and the Mediterranean open forest associating several oak species and grazed by cattle, sheep and pig (Dehesa/Montado). There are different types of agroforestry: silvoarable systems where arable or horticultural crops are grown simultaneously with a tree crop to provide an annual income for the farmer while the tree crops are still maturing or not producing fruits. Trees are often grown in rows with wide alleys in-between for cultivating crops, which provides income from both productions. Silvopastoral systems introduce or manage trees deliberately into a forage production system (grasslands) or, less commonly, forage is introduced or managed in a tree production system (forest grazing). A forest garden is a designed agronomic system based on trees, shrubs and perennial plants, that all produce either edible fruits, leaves, bulbs or aerial stems. These are mixed to mimic the structure of a natural forest. In forest farming, high-value speciality crops (e.g., mushrooms) are cultivated under the protection of a forest canopy that has been modified and managed to provide the appropriate conditions. It is a way of utilising forests for short-term income while high-quality trees are being grown for wood products[28].

INDICATORS

Extent of adoption and quality of management of agroforestry systems in the farm, in space and time (existence and appropriate management of trees or hedgerows in the farm or on farm margins, implementation of silvopastoral systems, use of fodder trees, implementation of forest gardens, implementation of forest gardening).

INTERVIEW QUESTIONS

(Observation of the farming system.)

- Are there any trees in the arable plots or in the pastures? To what extent?
- Are arable plots surrounded by hedges or tree lines?
- Do the animals graze between the trees in orchards?
- Do the animals graze on tree fodder?

- Is there a specific management system?
- Are some crops produced under the tree canopy or in the forest?

SCALE		
	1	not used at all
	2	rarely used and/or only in a small part of the farmed land (less than 25%)
	3	moderate use, in up to one half of the farmed land (25-50%)
	4	often used, in more than one half of the farmed land (51-75%)
	5	very often used and in all parts of the farmed land (more than 75%)

2 ECONOMIC VIABILITY

2.1 PRODUCTION COSTS

2.1.1 Minimised variable costs

DEFINITION

Variable costs include commercial inputs (goods) and services. In conventional agriculture, they, in general, increase or decrease depending on a farm's production volume - they rise as production increases and fall as production decreases. However, in agroecology the production technologies and other parts of the farm system can be (re)designed with the objective of decreasing variable costs via the use of locally available resources and the ecosystem services provided by biodiversity, such as biological nitrogen fixation, crop health protection by symbiotic microorganisms, or water absorption by endomycorrhizal fungi. Examples of variable costs include the costs of raw materials (e.g., fertilizer, pesticide, animal feed, fuel), services (e.g., work done by contractors, vets, and agricultural workers) and packaging[31].

GOOD EXAMPLES

Minimising economic dependency on commercial products, relying on natural processes and natural resources or non-monetary economy (e.g., exchanges of resources and materials between farmers).

INDICATORS

Yearly expenditures expressed in local currency compared to the regional average expenditures (for the crop/animal in question) per ha per year according to the farm type.

Below is a proposal on which indicators could be measured; it is not required

to have the exact results for all of them in order to assess the criterion, unless the assessor is interested in having more precise results for this criterion:

- 2.1.1.1 Irrigation water
- 2.1.1.2 Synthetic fertilizers
- 2.1.1.3 Organic manures
- 2.1.1.4 Pesticides
- 2.1.1.5 Plant growth stimulators
- 2.1.1.6 Effective micro-organisms
- 2.1.1.7 Biological control agents (BCAs)
- 2.1.1.8 Seeds and seedlings
- 2.1.1.9 Livestock sperm or ovule
- 2.1.1.10 Young animals
- 2.1.1.11 Animal feed
- 2.1.1.12 Veterinary drugs
- 2.1.1.13 Animal growth stimulators
- 2.1.1.14 Wages
- 2.1.1.15 Energy
- 2.1.1.16 Materials – Plastic, cardboard, etc.
- 2.1.1.17 Services

INTERVIEW QUESTIONS

- Do you buy 2.1.1.x?
- How many times a year?
- How much do you spend on it per year?

SCALE

1	expenditure much larger than the regional average (larger than 160%)
2	expenditure larger than regional average (121-160%)
3	expenditure in the level of regional average (81-120%)
4	expenditure lower than regional average (40-80%)
5	expenditure much lower than the regional average (less than 40%) *In case something is not used at all it gets a 5 for the score.*

2.1.2 Minimised fixed costs - investments

DEFINITION

A fixed cost is a cost that does not change with an increase or decrease in the amount of goods or services produced or sold. Fixed costs are expenses that have to be paid by a farmer or a company, independent of any specific business activities[32]. Examples are investments in land, machinery, tools, buildings and other equipment.

GOOD EXAMPLES

Minimising large investments that are hard to pay off and which would force farmers to enter into debt.

INDICATORS

Fixed costs are here reduced to buildings and machinery/tools/technology. The investment is depreciated for 5 years for machinery and 20 years for buildings using the straight-line depreciation method with salvage value being 0, and then compared according to the farm type to the regional average expenditures.

2.1.2.1 Machinery, tools, technology. How to calculate: The investment is depreciated for 5 years for machinery using the straight-line depreciation method with salvage value being 0 (Depreciation = (Purchase Price − Salvage Value) / 5 years) – only count machinery bought in the previous five years.

2.1.2.2 Buildings and other infrastructure. How to calculate: The investment is depreciated for 20 years for buildings using the straight-line depreciation method with salvage value being 0. Only count investment in the past twenty years.

INTERVIEW QUESTIONS

- What machines do you have (how many tractors, attachments)?
- Which machines did you buy in the past 5 years?
- If there are machines bought in the past 5 years inquire about their price.
- Observe the buildings and other infrastructure in the farm. Is it large, expensive, or low-cost and simple?
- If there are new buildings inquire about the price of the investments.

SCALE

1	expenditure much larger than the regional average (larger than 160%)
2	expenditure larger than regional average (121-160%)
3	expenditure in the level of regional average (81-120%)
4	expenditure lower than regional average (40-80%)
5	expenditure much lower than the regional average (less than 40%)

2.2 REVENUE

2.2.1 High proportion of quality enhancement product valorisation practices

DEFINITION

"Value is a process of assessing and negotiating the value of a product as a combination of quality and price; and the way that the product creates value for the actors who are making, using and trading the products"[33]. Product valorisation and quality enhancement here refers to the sum of raw materials, practices, and processes, that the farmer uses and which result in higher quality foods, with characteristics such as 'healthy', 'natural', 'safe', 'fresh', 'tasty', and 'nutritious' food[33]; and the communication of these practices via an official certification scheme or by direct communication with customers, or by participation in a participatory guarantee system (PGS), etc.; with the goal of achieving a higher price for a product that is of higher quality. Adding value via processing food products is measured separately in the following criterion.

GOOD EXAMPLES

E.g., grass-fed meat, pastured eggs or dairy products; organic products, biodynamic products; meat of heritage breeds; traditional crop cultivars, processing grain with a stone mill, etc. - compared to usual conventional farming product (e.g., grain-fed meat, dairy products or cage-raised eggs; meat of very productive breeds; modern crop cultivars).

INDICATORS

Share of economic benefits coming from products for which some sort of product valorisation practices are used in the total revenue (production only): engagement in organic production, biodynamic production, regenerative production, agroecological production, or some other type of production with an emphasis on soil health, nutrient-dense foods and without pesticide residues; grass-fed meat and dairy products, proportion of products containing traditional crops and heritage breeds.

INTERVIEW QUESTIONS

- Which crops and animals do you grow and raise?
- What kind of products do you produce from them?
- Do you achieve higher prices for some products thanks to their high quality or type of production they are produced from?

SCALE

1	no use of quality enhancement product valorisation practices
2	low use of such practices – up to 10% of economic benefits comes from products with quality enhancement practices
3	moderate use of such practices – 11 to 30% of the economic benefits comes from products with quality enhancement valorisation practices
4	high use of such practices - 31 to 60% of the economic benefits comes from products with quality enhancement valorisation practices
5	very high use of such practices more than 60% of the economic benefits comes from products with quality enhancement valorisation practices

2.2.2 High proportion of locally or self-processed products

DEFINITION

Selling processed (transformed, manufactured) rather than raw products, is a way of increasing profit margin. However, due to regulation and investment needed, it can be more profitable to use a local processing facility or to bring products to another farmer or craftsman/craftswoman that has the appropriate machinery.

GOOD EXAMPLES

Adding value to products by self-processing or other farmers transforming them in the vicinity, or by small and local food processing enterprises, (e.g., selling wheat pastry or flour rather than grain, cured meat or meat pieces rather than living animals).

INDICATORS

Proportion of farm's products that are processed in the farm, or with other farmers or in a cooperation with a small local processor.

INTERVIEW QUESTIONS

What kind of products do you produce?
Is everything sold raw or something is processed/transformed?

SCALE

1	all produce sold raw
2	up to 10% of products sold are processed products
3	11-30% of the products sold are processed products
4	31-60% of the products sold are processed products
5	more than 60% of the products sold are products that are processed by the farmer and/or small-scale and locally

2.2.3 Short marketing chains

DEFINITION

Short marketing chains constitute an excellent way to gain higher added value, especially for small and medium size farms by the removal of 'the middle man', and thus warranting steadier revenues [34]. The food products that are marketed via short market chains are usually perceived by customers as 'local' and 'reliable', thus bringing added value to the products. Depending on the produce on the farm, different types of supply chains might be used.

GOOD EXAMPLES

The following types of short food supply chains involve one or more of the dimensions of proximity described above: direct on-farm sales; direct sales in local markets; sales in stores (collective points of sale, restaurants, retail merchants, others) and local supermarkets; home delivery; advance sales; mail orders or electronic commerce; direct on-farm consumption (agritourism); direct sales to canteens in the public and private sector; short marketing chains on the international market (e.g., to a 'sister' cooperative in another country)[35].

INDICATORS

There are several typologies of short food supply chains (SFSCs), in this case we opted for the one based on the number of intermediaries in the supply chain from the farm to the consumer, and the typology relating to the geographical distance is dealt with separately in the next indicator.

INTERVIEW QUESTIONS

- What is your marketing scheme?
- To whom do you sell your products?
- Is it retail, internet, farm-gate, restaurant?
- Are you involved in some short supply chains (direct sales, CSA, shops without intermediaries)? How many intermediaries are there?

SCALE

1	most of the revenue is generated through long marketing chains, which have more than 3 intermediaries, or the length of the marketing chain is not known
2	most of the revenue is generated through long marketing chains, which have 2-3 intermediaries
3	most of the revenue is generated through long-short marketing chains (1-2-3 intermediaries in different channels)
4	most of the revenue is generated through short marketing chains and direct sale, with 0-1 intermediary
5	most of the revenue is generated through direct sales

2.2.4 Local marketing chain

DEFINITION

Local marketing chain refers to the effort the farmer makes to sell their products in close vicinity to their farm, which results in the development of relationships with the local community, increases the freshness of the food, and reduces the quantity of energy used for transportation.

GOOD EXAMPLES	Joint Research Centre's (JRC) 2013 scientific and policy report on short food supply chains and local food systems defines local food system as "a food system in which foods are produced, processed and retailed within a defined geographical area" (depending on the sources, within a 20 to 100 km radius approximately)[36].
INDICATORS	Average distance (in km) that most of the farm products (in quantity) travel to get to the final consumer (i.e. length of the marketing chain).
INTERVIEW QUESTIONS	• Are the products mostly sold for the local, regional or national market, or are they exported abroad? • Where to?

SCALE		
	1	most products travel more than 1000 km[35] to the final destination, or the distance is not known
	2	most products travel 1000-500 km to the final destination
	3	most products travel 500-250 km to the final destination
	4	most products travel 250-100 km to the final destination
	5	most products travel less than 100 km to the final destination

2.2.5 High level of diversification of activities

DEFINITION	Diversification and integration of non-farming activities can help farmers to enhance their revenue and reduce their economic vulnerability should a single crop, livestock species or other commodity fail.
GOOD EXAMPLES	Examples of some activities that the farmer can go into are agritourism, food processing, providing training and other educational activities, having another primary or secondary job.
INDICATORS	Number of additional non-farming activities present on the farm (e.g., processing food, farm shop, agritourism...).

INTERVIEW QUESTIONS	• Are there any additional activities you are involved with (e.g., agritourism, hosting events, education and training, food processing, gastronomy, working as a contractor, selling products from other farms)?

SCALE	**1**	no additional non-farming activities
	2	slight engagement in an additional activity, the activity brings minor additional revenue
	3	moderate engagement in additional activities, the activities bring some additional revenue
	4	high engagement in additional activities, the activities bring an important additional revenue OR the farmer has a primary job and farming is a secondary activity
	5	high diversification of activities, the non-farming activities combined bring equal revenue as farming, or higher

2.3 INCOME

2.3.1 Satisfaction with economic benefits from farming activities

DEFINITION	The farmers judgment of their income is a measure of the financial situation of the farmer, of their 'social sustainability', and is a major contributor to satisfaction within their profession and to their general quality of life[38].
GOOD EXAMPLES	Being sufficiently satisfied with the farm's income.
INDICATORS	Measures farmer's subjective judgment (satisfaction) with the income coming from farming activities.
INTERVIEW QUESTIONS	• How satisfied are you with your income, on a scale from one (very low satisfaction) to five (very high satisfaction)?

SCALE	**1**	very low satisfaction
	2	low satisfaction

3	moderate satisfaction
4	high satisfaction
5	very high satisfaction

2.3.2 Similar or higher benefits compared to other farmers

DEFINITION Objective assessment of the evaluator on how large the profit of the farm is in the context of the region where it operates.

GOOD EXAMPLES Similar or higher benefits as other farmers of the region.

INDICATORS The estimation of the evaluator (considering the farmer's input and the previous criterion), taking into consideration other similar farms of the region and the profits that they make.

INTERVIEW QUESTIONS How much do you earn per year (approximately)?
Is this higher or lower compared to other farmers in the region?

SCALE

1	significantly lower income than comparable farms in the region
2	lower income than comparable farms in the region
3	approximately equal income as comparable farms in the region
4	higher income than comparable farms in the region
5	significantly higher income than comparable farms in the region

3 SOCIO-POLITICAL ASPECTS

3.1 LABOUR CONDITIONS AND JOB CREATION

3.1.1 Humane and safe working conditions

DEFINITION

Waged agricultural workers make up a significant segment of the global rural workforce and they should be recognized as playing a vital role in sustainable rural development. Despite that, the 450 million women and men who labour as waged workers within agriculture at the global level have been largely overlooked. Agriculture is one of the three most dangerous industries according to the International Labour Organisation, as at least 170,000 deaths occur worldwide from workplace accidents each year. The risk of dying from work-related injuries and illnesses is twice as high as in other sectors[39]. Agricultural workers suffer high rates of injury, illness and death due to high levels of workplace risk (e.g., machinery and pesticide use); long working hours; limited safety measures; and poor living conditions. Denial of basic human rights and high rates of informal and casual/temporary employment limit the organization of agricultural workers in trade unions, thus denying the basic human right to freedom of association. There is also prevalent discrimination of different groups of agricultural workers: women, migrants, and Indigenous Peoples often experience lower wages, poorer employment conditions, and higher rates of poverty[40].

GOOD EXAMPLES

Pesticide-free environment (especially avoiding routine exposure), respectful and equal treatment of workers, high levels of safety in the workplace.

INDICATORS

- The workers are provided with proper tools and suitable work clothes.
- All hazardous machinery and equipment are equipped with adequate safety devices, safety equipment is provided to all workers who are instructed and monitored in its proper use, equipment for use of chemicals is stored properly.
- All chemical handlers are thoroughly instructed and trained in the safe application and the risks of pesticides and chemicals.
- The re-entry intervals (the minimum amount of time that must pass between the time a pesticide was applied to an area or crop and the time that people can go into that area without protective clothing and equipment) as defined by the manufacturer after spraying of pesticides is strictly followed.
- No discrimination on the basis of race, colour, gender, sexual orientation, disability, religion, or political opinion.
- Freedom of association.
- Complying with applicable national and local legislation, and industry standards, regarding working hours and overtime regulations, with a mandatory one day of rest for every 6 consecutive days worked.
- Lunch and work breaks should be granted and respected[41].

INTERVIEW QUESTIONS

- *Observe the conditions in which the workers work in.*
- Are they safe?

- Do they seem satisfied?
- Is there discrimination on the basis of race, colour, gender, sexual orientation, disability, religion, political opinion, or freedom of association?
- Is there compliance with national legislation and industry standards regarding working hours and overtime regulations, with a mandatory one day of rest for every 6 consecutive days worked?
- Are lunch and work breaks granted and respected?
- Are the workers provided with proper tools and suitable work clothes?
- Is all hazardous machinery and equipment equipped with adequate safety devices, with safety equipment that is provided to all workers who are instructed and monitored in its proper use?
- Is equipment for chemical spraying stored properly?
- Are all chemical handlers thoroughly instructed and trained in the safe application, and the risks of pesticides and chemicals?
- Are re-entry intervals after spraying pesticides as defined by the manufacturer strictly followed?
- If the company provides housing for permanent or seasonal/temporary workers - is it safe and appropriate for the number of people living within it?

SCALE		
	1	very inhumane and unsafe environment
	2	unsafe environment, e.g., problematic handling of pesticides
	3	relatively safe environment, but some problems noticed
	4	safe environment with minor safety issues to be resolved
	5	very safe working environment

3.1.2 Fair wages, high job stability, solid provision of social protection

DEFINITION

Agricultural workers are part of the core rural poor in many countries. Fewer than 20% of agricultural workers have basic social security and often work in hazardous occupations, suffer exploitative working and pay conditions, have insecure contracts with frequent periods of unemployment, and have little access to social protection. Globalization and increased competition at the farm level and along the supply chain have brought about higher rates of casual employment in agriculture, which threatens the livelihoods of agricultural workers. Wages in the agricultural sector are amongst the lowest and do not necessarily rise with increased productivity. Social security (e.g., medical insurance and employment protection) is poor and decreasing with the increasingly casual nature of agricultural labour. Weak legal frameworks that govern employer-employee relationships in agriculture are difficult to enforce in remote rural areas. These poor employment conditions result in high rates of poverty, insecure employment, abuse of power by employers/contractors, and illegal

movement of persons. Forced labour is also higher in agriculture than in other sectors.

GOOD EXAMPLES

Having clear employment contracts (included for temporary workers) and regular and documented payments.

INDICATORS

- Maternity and sick leaves are granted and respected in accordance with national laws.
- The company provides legal social security for permanent workers.
- All regular work is undertaken by permanent workers and time-limited contracts are used only during peak periods or in special tasks.
- All permanent workers have a provident fund or pension scheme.
- The wages are at least as high as the regional average for similar occupations or higher[41].

INTERVIEW QUESTIONS

Observation of the farm, interview workers on the conditions they work in following the issues enumerated above.

- What is your salary?
- How many hours do you work weekly?
- How satisfied are you with the job?
- Do you have clear employment contracts (included for temporary workers) and regular and documented payments?
- Are maternity and sick leaves granted and respected in accordance with the national laws?
- Does the company provide social security for permanent workers?
- Do all permanent workers have a pension scheme or provident fund?

SCALE

1	none of the requirements above satisfied (highly precarious job with no social protection and insufficient wage and/or without contract)
2	low wages and precarious but with a binding contract, some social benefits
3	clear contracts but with a wage below the regional average, reliance on temporary workers
4	most of the requirements above are satisfied
5	all of the requirements above satisfied

3.1.3 High level of gender equity

DEFINITION

Equity is defined as fair treatment of people according to their needs, desires, and possibilities. Around 40% of global agricultural workers are women, who are nonetheless a marginalized group in most rural areas. Women agricultural workers face all kinds of issues in the workplace: discrimination (e.g., being paid less for the same job), sexual assaults, and undignified working conditions (e.g., lack of private areas for changing clothes or physical needs). Further, the global labour burden of rural women often strongly exceeds that of men, with a significantly higher proportion of unpaid household responsibilities, such as preparing food or taking care of the children and elderly. Due to time constraints, women are more likely to work in informal arrangements and in part time jobs that provide fewer benefits and pay less - another contributing factor to why there are significantly less women in managerial positions in agriculture. For self-employed women there are often strong intra-household inequalities, characterized by limited decision-making ability, lack of access to land and other resources, and a lack of possibilities to participate in structures such as assemblies, cooperatives, unions, etc.

GOOD EXAMPLES

High ratio of women in managerial positions, possibilities for reconciliation of working hours with personal/family needs offered (e.g., some level of flexibility with the working hours for both for men and women), equal pay for equal jobs, equal distribution of household labour, possibilities to choose roles in the farm, and a reasonable framework or rotation of roles.

INDICATORS

Ratio of women in decision-making positions, women's satisfaction with workplace, gender gap in salary and other benefits.

Additional indicators for family-run small farms: participation and level of autonomy in techno-productive decision-making (e.g., inputs, financial decisions), existence of a gender gap in average daily working hours (including non-remunerated reproductive labour in family farms), land and livestock ownership, existence of a gender gap in (political) participation.

INTERVIEW QUESTIONS

These questions should be asked separately to each spouse and any male and female family members in case of evaluating a family farm, or to female employees in case more than just family members are involved.

- How are decisions made in the farm?
- Who makes the decisions?
- Is there some kind of division of labour?
- How does it work?

- Who makes the decisions about crops, animals, machines, marketing?
- If you are in charge of something, do you make the decision by yourself or in consultation with your spouse/other family members?
- (If the farm is a member of an association, cooperative, etc.) do you or other family members usually participate in the meetings?
- How involved are you with this aspect of the farm?
- How many hours do you work on an average day, including household chores, or helping other family members?
- Are the working hours that you and your family put in acceptable or tolerable?
- How would you estimate yours and your family's workload from 1 - very big to 5 - acceptable (think of how much spare capacity you have remaining after you finish working - time, energy)?
- Do female workers have any specific issues with the working environment?
- Do you feel safe?
- Is there possibility to choose roles within a reasonable framework?
- What is the proportion of women in managerial positions? (It is better if these questions are asked indirectly in the conversation.)
- Is there some sort of flexibility with working hours if a person needs to attend to, pick up children, etc.?

SCALE	
1	very low level of gender equity (e.g., extreme differences in working hours or salary between men and women, general discrimination and unsafe environment for women, low to none participation in decision-making by women, very low to no participation in local social events)
2	low level of gender equity (e.g., large differences in working hours between men and women, differences in salaries and no women in managerial positions, most decisions are made by men solely)
3	medium level of gender equity (some percentage of women in managerial positions, equal salaries, women feel safe in the working environment, women participate in the local assemblies but usually not in an active role, differences in total working hours between man and women, most decisions are made by man with women being consulted or women have authority for some matters that are considered to be 'marginal')
4	high level of gender equity (small differences in total working hours, women are in 1/3 of the managerial positions, women have authority in realms that are not considered marginal, women make decisions by themselves for relatively equal number of matters as men do, good level of participation in political and social life)
5	very high level of gender equity (equal or higher number of women than men in managerial positions, equal total working hours, rotation of roles between man and women/men and women equally participate in all

types of activities, some measures for conciliation between working hours and personal time in place (e.g., some flexibility in working hours for parents/caregivers), gender equality is one of the goals the farm is working towards, and critically examines their work in meetings, very high level of participation in local political and social life.

3.1.4 Large comparative contribution to job creation

DEFINITION

Job creation is defined as "the process of providing new jobs, especially for people who are unemployed"[42]. It is especially important in rural areas that are facing depopulation and an aging population due to limited job opportunities for young people. Since different types of farms have very different needs in terms of workforce/ha, the indicators of both farm size and farm type are considered. The chosen unit of measure is a full-time equivalent, which is a unit to measure the number of employed persons in a way that makes them comparable even though they might work for different numbers of hours per week. It is obtained by comparing an employee's average number of hours worked to a full-time worker. A full-time worker is counted as one full-time equivalent (FTE), while a part-time worker gets a score in proportion to the hours they work[43].

GOOD EXAMPLES

High number of people are employed, they have permanent contracts rather than time-limited contracts.

INDICATORS

Number of FTE compared to regional averages for the farm type in question multiplied by coefficient indicating farm size.

INTERVIEW QUESTIONS

- What is the size of your land/the land that you use?
- What is the dominant production?
- How many workers do you employ?
- How many people from your family work in the farm?
- Do you, and do they, work full-time or part-time?
- Are the workers employed seasonally (if so, how long is the season)?
- How many people are employed seasonally and how many throughout the year?
- If the farmer can approximate, how many full-time equivalents (FTE) are there in total?

SCALE

1 contribution to job creation is much lower than the regional average considering farm type and size (less than 40% of the average number of FTEs)

2	contribution to job creation is lower than regional average considering farm type and size (40-80% of the average number of FTEs)
3	contribution to job creation in the level of regional average considering farm type and size (81-120% of the average number of FTEs)
4	larger contribution to job creation than the regional average considering farm type and size (121-160% of the average number of FTEs
5	much larger contribution to job creation than the regional average considering farm type and size (larger than 160% of the average number of FTEs)

3.1.5 High ratio of employment of people at risk of poverty and social exclusion

DEFINITION

The farm is devoted to creating a positive influence in the social sphere. A part of their manifesto (official or unofficial) states that people that belong to various at-risk groups (of social exclusion or marginalisation) have an advantage when applying for a position in their farm.

GOOD EXAMPLES

Some examples of these groups are Roma people, migrants/refugees, women older than 50, ex-prisoners, homeless people, etc. (according to the country context). It is very important that they are not employed solely to get some form of benefits and then face disparate treatment. They should be receiving equal remunerations as other workers.

INDICATORS

Expressed values towards employing people at risk of poverty and social exclusion, proportion of workers belonging to some marginalized group employed in the total workforce, receiving of equal treatment as other workers.

INTERVIEW QUESTIONS

- Do you employ any marginalized groups of people (e.g., pensioners, unemployed women over 50, Romani people, refugees, etc.) via social bureau or by private initiative?
- What was your initial motivation to employ socially marginalized groups of people?
- What has this experience been like?

SCALE

1	no desire to employ people at risk of social exclusion
2	indifferent

3	positive opinion on the idea but without implemented action
4	a few of workers employed are people under risk of social exclusion, positive attitude from the farmer
5	clear manifesto (formal or informal) on employing people under risk of social exclusion, they constitute 20% of the workforce or more

3.2 COOPERATION AND NETWORKS

3.2.1 Substantial and continuous participation in networks, collectives, organisations

DEFINITION

Participating in some form of collective projects, be it formal or informal, requires different resources from the participants, such as time or energy, but forms the basis of the collaborative bottom-up approach (juxtaposed to competition of actors) driving the deeper transformation of systems, especially of socio-economic systems[44]. Even if collectives are not specifically working towards agroecology, the partnership, feeling of belonging, and trust that is forged (social capital), minimization of costs, and the collective learning and sharing of capacities[45] forms a strong basis for the further involvement with agroecology.

GOOD EXAMPLES

Being a part of regional associations, associations of producers, cooperatives, some form of CSAs (Community Supported Agriculture), Participatory Guarantee Systems, social movements, Food Councils, cooperation projects with schools and universities, etc.

INDICATORS

Number of collective projects the farm is a part of and the intensity of involvement in these projects.

INTERVIEW QUESTIONS

- Do you participate in some associations?
- Cooperatives?
- Networks?
- Movements?
- Do you work together with some farmers to achieve a specific goal?
- What is your level of involvement?
- Do you see a purpose in this organisation and a value in your effort?

SCALE	**1**	no participation in collective projects, no cooperation with other farmers
	2	membership in one or two projects/organisations, but without genuine participation
	3	membership in a few projects/organisations, with occasional involvement
	4	membership in a few projects/organisations, some with involvement OR membership in one project with good involvement, very good cooperation with other farmers
	5	membership in several projects/organisations with good involvement; or in one or a few with very strong involvement, strong cooperation with other farmers.

3.2.2 Substantial and continuous participation in Social and Solidarity Economy

DEFINITION

Social and Solidarity Economy (SSE) is an economic approach that favours decentralization and local development. It is driven by ethical values such as solidarity, fair trade, voluntary simplicity, and Buen Vivir. It is holistic in the sense that there is a simultaneous pursuit of some combination of economic, social, environmental, and emancipatory objectives. The social sphere is built on principles of mutuality, solidarity and reciprocity, and advocates for comprehensive social protection and redistribution. Empowerment not only refers to the economic dimension, but also to political aspects - representation through self-organization, participatory governance, and collective action. The common principle is the primacy of social objectives over profit[46]. Traditional peasant agriculture follows a multi-functional logic which does not reduce agriculture to an economic activity but also values the non-monetary exchanges of products and services. In peasant agriculture, agricultural production is first and foremost dedicated to household needs or for local markets[47]. It might thus be that a farm has low financial income, but has high benefits from a non-monetary economy.

GOOD EXAMPLES

Solidarity farmers' markets, Community Supported Agriculture, cooperatives, social enterprises, etc. Non-monetary forms of economic exchange based on barter, reciprocity, gift relations, and solidarity[48].

INDICATORS

Intensity and continuity of involvement in social and solidarity economy (including non-monetary economy), proportion of the farm benefits (financial or goods) coming from these sources.

INTERVIEW QUESTIONS

- Do you exchange your products or animals with other farmers?
- Is or was the farm involved in some charity or solidarity economy projects?
- Are you a part of a cooperative, CSA, social enterprise, solidarity farmers' market?
- What are the values of this cooperative/social enterprise?

SCALE

1	not in any way involved in solidarity or non-monetary economy
2	marginal involvement in one-off actions supporting some form of solidarity or non-monetary economy
3	occasional involvement in some form of solidarity or non–monetary economy
4	continuous involvement in some form of solidarity or non-monetary economy, it brings up to one-quarter of income/benefits
5	continuous involvement in some form of solidarity or non-monetary economy, it is the source for more than one-quarter of income/benefits

3.2.3 Substantial and continuous advocacy and education on agroecology

DEFINITION

In order for agroecology to spread and thrive globally, the actors involved in agroecological practices need to feel a responsibility to spread the concepts further and, in that way, enable the bottom-up spread of these concepts. The specific goals of the advocacy/education efforts do not necessarily have to be explicitly labelled as agroecology-related (it is not unlikely that the farmer is not familiar with the theory of agroecology), but if they are working, for example, towards strengthening of the local food systems via policy change, or supporting actors working with agroecology in other countries via transnational alliances, investing their time, energy, or other resources, it means that they are participating in advocacy for agroecology.

GOOD EXAMPLES

The farm organizes workshops, trainings, lectures and/or other educational activities, and/or awareness-raising activities about different topics from the realm of agroecology that can be directed towards various groups of citizens. The farm is a "living lab"*. The farm works individually or as a part of an organisation or a movement to change public policy to ensure that they are agroecological. This work might be a source of income or done on a voluntary basis.

* *"Living labs are initiatives in which experimentation is conducted on real farms, in specific territorial and community contexts, with farmers and other actors involved from the beginning as equal partners in proposing ideas, testing them, improving them and promoting them further"*[49]

INDICATORS Intensity and continuity of involvement in educational projects dealing with agroecology, advocacy activities related to any pillar of agroecology (could also be local, national or international).

INTERVIEW QUESTIONS

- Are there any educational activities you are involved with?
- Are you involved in some form of advocacy work (aiming to influence decision-making within political institutions)?
- In what way? What are your demands (policy objectives)?
- Do you collaborate with some school, university, research centre or farmers' association?
- In what way do you participate, how actively?

SCALE

1	no involvement in education, awareness-raising program or advocacy
2	marginal or one-off involvement in certain educational, awareness-raising or advocacy project
3	occasional involvement in educational, awareness-raising or advocacy projects
4	often involvement in educational, awareness-raising or advocacy activities
5	established educational or awareness-raising program that is continuously carried out, participation in a body that works with local/regional/national government as an advisor on some issue of agroecology or agroecology in general

3.2.4 Transparent communication and high level of accountability

DEFINITION

"Transparency is the deliberate attempt to make available all legally releasable information – whether positive or negative – in a manner that is accurate, timely, balanced, and unequivocal, to enhance the reasoning ability of the public, and hold organizations accountable for their actions, policies, and practices. Additionally, accountability includes an organization being open to criticism and being forthcoming"[50]. Transparency is hence important for agroecological farms in order to create value for consumers via personal contact and direct communication of the intrinsic quality of products (through social media, the Internet, personal exchanges, farm visits) or more indirect communication mechanisms such as participatory guarantee systems or using various labels indicating food quality or sustainability practices. This process raises awareness on the effects of sustainable farming practices on the environment and helps consumers make more informed choices. On the other hand, it is im-

portant for other farmers, so that they can learn from the publicly available information on the potential benefits and drawbacks of the system in question.

GOOD EXAMPLES

The farm has an open-door policy, invites interested public for tours of the farm, or to join volunteering actions. Timely information on farm news is provided via a website, bulletin, mailing list, social media page, or some other form of communication. The customers may obtain data about farm practices, the farm informs on the effects of the practices on the environment (e.g., before and after photos of farmed soil).

INDICATORS

Existence of a website or social media sites, how recent the information communicated are, level of detail explaining the practices used on the farm, existence of open days and how frequent they occur, whether the farmer has carried out tests for soil health and water quality.

INTERVIEW QUESTIONS

- How do you transmit information about the farm to your customers?
- Do you have open days?
- Do you have a website?
- Are you active on social media?
- Do you perform any kind of quality control or environmental test?
- Would you/do you share this information with your customers?

SCALE

1	the farm does not have any communication channel, nor does it enable farm visits, nor does it provide any form of assurance of its practices
2	the farm does some tests and/or has some communication channel(s) but it uses it rarely
3	the farm provides information about its practices via communication channels
4	the farm provides often provides information about its practices and also provides some information about the effects of their practices
5	the farm has an open-door policy, a strong emphasis on open communication with the customer and informs on the practices they use and their effects

3.3 LOCAL CULTURE AND KNOWLEDGE

3.3.1 Substantial use and promotion of traditional local seeds and heritage breeds

DEFINITION

"Over the last two decades, 75% of the genetic diversity of agricultural crops has been lost at global level. This phenomenon is having grave effects on various ecosystem services. Crop varieties, as an integral part of genetic diversity, are the result of human selection and management, as well as of natural mechanisms of evolution"[51]. Heritage breeds and traditional seeds refer to the traditional breeds of animals and crop varieties that have a record of being raised in a particular locality for a long period of time and they carry some unique genetic traits by which they are differentiated. Some of the advantages of using local traditional seeds and heritage breeds include: higher resilience, increased local adaptive capacity to climate change, increased agrobiodiversity (safeguarding the use of a high number of crop varieties and breeds, and a higher genetic variation among them), preserving farmers' knowledge, supporting the empowerment of communities who have the future of their crops in their own hands[51]. Heritage breeds are adapted to live in grasslands or rangelands, usually better withstand diseases, take longer to grow to market weight, and produce less milk, meat, and eggs than animals bred for industrial agriculture, but they require less commercial inputs. Moreover, most heritage breeds are dual purpose breeds, and they can provide a good income at low cost.

GOOD EXAMPLES

The farm saves/breeds or buys local landraces and heritage breeds. They are promoting forgotten or less-used seeds and breeds among other farmers, their customers, and in local fairs, seed exchanges and other types of events.

INDICATORS

Proportion of crops and breeds used that are traditional for the area, whether the farmer promotes their use (e.g., in fairs or seed exchanges) and to what intensity.

INTERVIEW QUESTIONS

- What animals do you raise?
- Which crops do you grow?
- For what reasons did you decide to have these breeds/varieties?
- Do you have some local breeds/varieties?
- Do you cross local breeds/varieties with other breeds? (Why?)

SCALE

1 no use of traditional seeds and heritage breeds

2	very slight (e.g., one marginal crop) or one-off use of traditional seeds or heritage breeds
3	occasional use of traditional seeds or heritage breeds
4	up to 20% of the crops or breeds are traditional, the farmer promotes their use occasionally
5	more than 20% of crops or breeds are traditional, strong promotion of their use

3.3.2 Strong involvement in preservation of traditional foods

DEFINITION

Cultural identity and sense of place are often closely tied to landscapes and food systems. Cultural practices, and indigenous and traditional knowledge, offer a wealth of experience that can inspire agroecological solutions since people and ecosystems have evolved together. Culinary traditions are built around local varieties and heritage breeds, and they make use of their different properties (e.g., knowledge of how to soak and prepare a particular type of beans or whether a variety of tomatoes is more suited for cooking or eating raw). Taking this accumulated body of knowledge as a guide, agroecology can help realise the potential of territories to sustain livelihoods and promote healthy diets. The ingredients for traditional foods could be obtained via personal production, conventional market purchase, wild harvest, hunting or Social and Solidarity Economy.

GOOD EXAMPLES

Preservation of traditional knowledge through use of traditional ingredients, recipes, and processes of food preparation and transformation.

INDICATORS

If the farm sells or exchanges transformed foods – proportion of sold transformed products that are made following traditional methods and recipes.

INTERVIEW QUESTIONS

- What kind of products do you produce?
- Is everything sold raw or are some things transformed/processed?
- Do you follow any traditional recipes and methods, or do you only use new and modern recipes?

SCALE

1	no transformation of products following traditional processes and recipes
2	transformation of products following traditional processes and recipes only for family needs

3	a small percentage of products transformed following traditional recipes and processes, or only partially transformed in the traditional way
4	most of the processed products that are sold are transformed following traditional processes and recipes
5	all transformed products sold are produced following traditional recipes and processes, strong promotion of the local traditional culture and products

3.4 QUALITY OF LIFE

In family farms, this section should be asked to both spouses if applicable, or to a female and a male member of the family or collective. The mean score from the two answers should then be taken as the final score. The differences between the answers should also serve to inform the score for the gender equity criterion. If it is not a family farm, the question can be asked to the manager if they are working on the farm, or skipped if the farm owner does not actually work on the farm.

3.4.1 Satisfactory workload levels

DEFINITION

The concept of workload refers to the amount of work (in hours per day) and how physically and/or mentally demanding the work that the farmer and his family carry out throughout the year is.

GOOD EXAMPLES

Designing standard operating procedures (SOPs) that strive for high efficiency, use of innovations and appropriate technology, delegating work to colleagues/ employees, designing farm with size and complexity in line with number of employees, etc.

INDICATORS

Self-assessment of the farmer on their workload.

INTERVIEW QUESTIONS

- Please self-asses your (and your family's) yearly workload on a scale 1-5; 1 being too large, 5 being very satisfactory.
- Think of how much spare capacity do you have remaining after you finish working (time, energy)?

SCALE

1	the workload is too large

2	very large
3	moderate
4	satisfactory
5	very satisfactory

3.4.2 Low stress levels work environment

DEFINITION

Stress is the state of mental or emotional strain or tension resulting from adverse or demanding circumstances[52]."By being self-employed entrepreneurs, and highly dependent on market prices, weather, and changing policies and prices, farmers may also be particularly exposed to stress resulting from vulnerability to external factors that they cannot control". [38]

GOOD EXAMPLES

Taking good care of one's mental health increases farm system resiliency.

INDICATORS

Self-assessment of the farmer on their workload.

INTERVIEW QUESTIONS

- Do you consider your job stressful?
- How stressful?
- What is the average amount of stress you experience throughout the year?

SCALE

1	extremely stressful
2	very stressful
3	moderately stressful
4	mildly stressful
5	not stressful

3.4.3 Sufficient time for family and social relationships

DEFINITION

The amount of free time that the farmer has to spend on personal relationships.

GOOD EXAMPLES	See best practices under Workload.
INDICATORS	Self-assessment of the farmer on the amount of time they have for personal relationships.
INTERVIEW QUESTIONS	• Do you feel like you have enough time for your family and your social relationships? • Could you please assess how much time you have on average, from 1 having no time for personal relationships, to 5 having enough time for personal relationships?

SCALE

1	no time for personal relationships
2	very little time
3	moderate amount of time
4	almost enough time
5	sufficient amount of time

3.4.4 Sufficient time for knowledge and skill acquisition

DEFINITION	The amount of free time the farmer has to spend on acquiring new knowledge and improving their skills.
GOOD EXAMPLES	See best practices under Workload.
INDICATORS	Self-assessment of the farmer on the amount of time they have for gaining new knowledge and skills.
INTERVIEW QUESTIONS	• Do you enjoy learning new skills and knowledge? • Do you have sufficient time to acquire new knowledge and improve your skills? • How satisfied are you with the time you have for personal education (on a scale from 1-5, 1 being having no time to acquire new knowledge and skills, to 5 being having sufficient time)?

- How do you usually learn?
- From whom do you learn the most (e.g., neighbours, family, internet, advisors, journals, other farmers, etc.)?

SCALE		
	1	no time for acquiring new knowledge and skills
	2	very little time
	3	moderate amount of time
	4	almost enough time
	5	enough time

3.4.5 Finding work meaningful

DEFINITION

Meaningfulness in the broadest sense is about work significance, or the overall evaluation of one's work and whether it is intrinsically valuable and worth doing. There are two key dimensions to it: the broader purpose of work serving some greater good or prosocial goals, and the self-realization as a sense of authenticity, autonomy, and self-expression at work[53]. Timmerman and Felix claim that work in agroecology is more meaningful compared to conventional farming and can lead to more 'contributive justice', as it compensates for the heavy workload by providing other resources and elements of well-being such as freedom (autonomy of the farm), personal initiative, social and peer recognition, increased dexterity, inter-influence among farmers, and development of farmers' skills, knowledge, and capabilities. Agroecological principles thus encourage a reconceptualization of farm work. The continuous development of skills and the acquisition of experiential knowledge on local ecosystems and agricultural techniques, facilitate self-determination and lead to more bargaining power. This kind of work is also more attractive to the younger generation, which is an essential factor for safeguarding the continuity of family farms[54].

GOOD EXAMPLES

Direct contact with customers, providing foods high in nutrients and safe for consumption, preserving traditional seeds/breeds and practices, preserving and enriching biodiversity, implementing practices that contribute to climate change mitigation, employment of people at risk of poverty or social exclusion, fair distribution of work and tedious tasks, etc.

INDICATORS

Self-assessment of the farmer on the amount of meaning, motivation, and self-realisation they attribute to their work (additional remarks can be added to the qualitative part).

INTERVIEW QUESTIONS	• How fulfilling and meaningful do you find your job? • Extra questions for clarification: • Do you think your job is important? • Do you feel motivated to do it? • Do you find there are opportunities in your job for learning new skills and 'self-realisation'?

SCALE	
1	It is not fulfilling at all / I don't feel motivated to do my job at all (I would much rather be doing something else) /I don't think it is an important job
2	It is not fulfilling. I only feel motivated on rare occasions (I wish was doing something else for the most part, but there are some good days)/ I find my job to be not very important for the wider community
3	I sometimes feel fulfilled and motivated about my job, but there are still a lot of days when I would rather work another job/ I find my job some what important for the wider community
4	I mostly feel motivated to do my job, it is fulfilling / I find my job is very important for the wider community
5	I feel very fulfilled with the job that I am doing, I am very motivated, and wouldn't genuinely consider any other job/ I find my job is extremely important for the wider community

3.4.6 Good level of self-consumption of food products

DEFINITION	Self-provisioning is a marketing strategy to both reduce the costs for buying food and to ensure a diverse and healthy diet for the family. Self-consumption of food products is for the purpose of this analysis characterized as the proportion of produce from the farm in the family diet (kitchen garden included).
GOOD EXAMPLES	Highly diversified production providing for most of the family's needs, mixed farming (combining crops and animals), agroforestry, exchanges with other farmers.
INDICATORS	Share of products in the farmer's diet that come from the farm or are received through non-monetary economy.
INTERVIEW QUESTIONS	• What is the proportion of the produce from your own farm in the family diet? • Could you assess the percentage?

SCALE	**1**	nil or extremely low (<10%)
	2	10-20%
	3	21-40%
	4	41-60%
	5	more than 60% - very high

3.5 FARM VIABILITY

3.5.1 Farmer's perspective on farm's future

DEFINITION

Measures how the farmer feels about the farm's viability in the long-term.

GOOD EXAMPLES

Good quality of life, good level of farm profitability and presence of a successor will likely lead to optimistic perspectives on the farm's future.

INDICATORS

Self/assessment (opinion) of the farmer on the future of their farm. Additional remarks can be added to the qualitative part.

INTERVIEW QUESTIONS

- Are you optimistic or pessimistic about the farm's future?
- Could you please quantify your feeling by a number on a scale from 1 being completely pessimistic to 5 being completely optimistic?

SCALE	**1**	completely pessimistic
	2	pessimistic
	3	neither pessimistic nor optimistic (or no opinion)
	4	optimistic
	5	completely optimistic

3.5.2 Young farmer or presence/ high chances of successor

DEFINITION

Generational transfer in agriculture is an important issue in Europe. Only if farming is regarded as a rewarding and profitable profession will young peo-

ple be interested in taking over farm business from their parents or starting their own. This indicator measures whether there is genuine possibility that the farm will continue functioning in the long-run considering farmer's age and whether or not somebody is willing to take on the farm after the current farmer retires.

GOOD EXAMPLES

Children of the farmer or other family members are very interested in taking over the farm, community ownership of the farmland with a sufficient number of active members, young farmers.

INDICATORS

One of the people running the farm is a young farmer (<50 years old), the farm has been acquired recently, or the children (teenage or adult) of the farmer are interested in farming or are already working with them, or there is someone outside of the family that is willing to continue the farm business.

INTERVIEW QUESTIONS

- What is your age?
- If the farmer is older than 50:
  - Is there someone in your family interested in working with you and later taking over the farm?
  - Is there someone outside of your family who is interested in working with you and later taking over the farm?

SCALE

1	no chance to have a successor
2	small possibility of having a successor
3	a moderate possibility to have a successor
4	good possibility to have a successor
5	very high probability to have a successor or a successor took over the farm in the last 5 years or the farmer is a young farmer (under the age of 50)

4 ENVIRONMENT AND BIODIVERSITY

4.1 ENVIRONMENTAL IMPACT

4.1.1 Minimal pollution

DEFINITION

Agricultural pollution is defined in this analysis as the existence of biotic and abiotic by-products of farming practices that result in the contamination or degradation of the environment and surrounding ecosystems. This criterion measures three types of pollution:
1 whether the farm practices induce leaching of nitrate, phosphate or organic effluents in the ground or surface waters;
2 whether pesticides that harm insects, pollinators or habitats are used; and
3 whether significant amounts of waste of various kinds are generated.

GOOD EXAMPLES

Mixed farms (potential food waste is used to feed animals and there is a reduction in use of synthetic fertilizers), use of biodegradable packaging, appropriate storage for farmyard manure, minimal use of plastics (including plastic mulch foils), minimal and properly timed use of commercial fertilizers and pesticides.

INDICATORS

Type and amount of pesticides used, type and amount of fertilizer used, type of fertilizer application, type of manure storage, type of packaging of the produce, use of plastic mulch foil, greenhouse plastic, plastic for silage, etc.; total amount of waste generated (food waste, plastic waste, general waste) and waste disposal management.

INTERVIEW QUESTIONS

To be estimated by the investigator taking into account:

- Which type of pesticides is used, and in which amounts?
- Which type of fertilizers is used, and in which amounts?
- How is the fertilizer is applied?
- How is organic manure stored?
- How are the products packaged?
- Is plastic mulch foil used?
- How much waste (food waste, plastic waste, general waste) does the farm produce?
- How is the disposal of waste managed?

SCALE

Note – if any of the pollution sources enumerated is highly present in the farm (from pesticides or phosphates or nitrates or considerable use of plastic, etc.) – the pollution should be classified as high. There does not have to be more than one source pollution.

1	very important pollution (e.g., due to usage of highly toxic and/or pesticides with long half-life)
2	important pollution
3	medium pollution

4	low pollution level
5	almost none or no pollution (almost everything is recycled, the minimum amount of plastic is used, no harmful chemicals are released).

4.1.2 Soil carbon budget optimization

DEFINITION

Agricultural soils are among the planet's largest reservoirs of carbon and hold the potential for expanded carbon sequestration. Thus, they provide a way of mitigating the increasing atmospheric concentration of CO_2. Soil carbon budget optimization refers to the use of practices that have a positive effect on the enhancement of the soil's capacity to act as a carbon sink (carrying out carbon sequestration), and minimisation of practices that turn soil into a net source of GHGs. Some agricultural practices are known to stimulate the accumulation of additional soil carbon with additional positive effects on soil fertility, crop productivity and other environmental effects[55] .

GOOD EXAMPLES

Table 1. *Changes in land management that can increase soil carbon. Table adapted from West et al.: Carbon Management Response Curves: Estimates of Temporal Soil Carbon Dynamics. (2004)*[56]

ARABLE LAND AND PERMANENT CROPS	PERMANENT GRASSLAND
Reduced tillage intensity	
Inclusion of legumes in rotation	Rotational stocking system and adequate stocking rate (no over-grazing)
Increase crop rotation complexity	Inclusion of legumes in the sward
Good crop waste management	Farmyard manure, compost, ramial wood-chip application
Inclusion of legume-based temporary grassland in crop rotation	Conversion of cropland to grassland/pasture
Inclusion of cover crops for a maximum soil cover over time	Use of deep-rooting species
Reduction of synthetic fertilizer use	Reduction of synthetic fertilizer use
Erosion reduction (e.g. terracing)	Erosion reduction
Agroforestry	Agroforestry

INDICATORS Type of soil tillage technique, proportion of soil covered with biological material (especially living plants), level of diversification of crop rotations, whether crop residues are burned, composted, or buried; use of organic or chemical fertilizers, type of grazing and stocking system in place.

INTERVIEW QUESTIONS *Information can be obtained combining information received through questions about crop rotations, soil tillage, fertility management, soil cover, grassland management, agroforestry (see Dimension 1).*

- Has the general soil structure changed since you started farming?
- Have you done analysis of soil organic matter (SOM)?
- If yes, what were the results? Has the SOM increased since you started farming?

SCALE

1	extreme overgrazing and/or intensive tillage, no use of cover crops, regular burning of crop residues, no crop rotation, no use of organic fertilizers
2	overgrazing and/or intensive tillage, some use of cover crops, very simplified crop rotation, rare use of organic fertilizers, often burning of crop residues
3	slight overgrazing/ tillage according to regional good practices, occasional cover crops/green manures, crop rotation, occasional burning of crop residues
4	adequate grazing management, conservation tillage, 70% of soil covered, long crop rotation, often use of compost and manure, annual cover crops, some trees present, surface or compost decomposition of crop residues
5	holistic rotational grazing management, improved pastures with deep-rooting species, no-till or minimum-till, surface decomposition or composting of crop residues, use of temporary grasslands in crop rotation, agroforestry, perennial cover crops

4.1.3 Soil erosion minimalisation

DEFINITION Soil erosion is when the topsoil is moved by water, wind or tillage. Topsoil, which is high in organic matter, fertility, and soil life, is relocated elsewhere 'on-site' where it builds up over time, or is carried 'off-site' where it fills in drainage channels. Soil erosion reduces cropland productivity and contributes to the pollution of adjacent watercourses, wetlands, and lakes. Generally, soils with faster infiltration rates, higher levels of organic matter, and improved soil structure have a greater resistance to erosion. Tillage and cropping practices

that reduce soil organic matter levels, cause poor soil structure, or result in soil compaction, contribute to increases in soil erodibility. Generally, if there is more vegetation or residue cover at or near the surface, there is less water erosion. Vegetation and residue combinations that completely cover the soil and intercept falling raindrops at and close to the surface are the most efficient in controlling soil erosion. On the other hand, the steeper and longer the slope of a field, the higher the risk for erosion[57]. For all sites that are situated at slopes that have inclination higher than 2 or 3%, there should be some measures taken against erosion. Cross-slope cultivation and contour farming techniques discourage the concentration of surface water runoff and limit soil movement.

GOOD EXAMPLES

Appropriate stocking intensity (no overgrazing), not leaving soil bare (using cover crops, extending growing season, planting grasses and shrubs, using mulch from biological sources), agroforestry, using contour farming, terracing, strip cropping, concentrating runoff with flumes or building swales for fields on inclinations, reduced tillage, direct seeding, increasing SOM level, limitation of the surface of spring crops (e.g., maize, potato, sugar beet).

INDICATORS

Inclination of the farmed land, proportion of farmed land with visible signs of erosion, type of soil tillage technique, use of cover crops, proportion of soil covered with living plants, management techniques reducing soil erosion implemented (contour farming, terracing, strip cropping, windbreaks), type of fertility management (regarding the SOM level). *Information can be obtained combining information gathered for Dimension 1.*

INTERVIEW QUESTIONS

- Observe the farm for signs of erosion.
- Ask farmer whether they have problems with erosion.
- Consider also answers about soil tillage, cover crops, soil coverage, application of contour farming, terracing or strip cropping, type of cropping system, windbreaks, fertility management (SOM level).

SCALE

1	presence of mudslides or erosion channels in most parts of the farm, very strong presumption about erosion happening considering management practices
2	presence of mudslides or erosion channels in many parts of the farm, a strong presumption about erosion happening in some parts of the year or slowly
3	presence of mudslides or erosion channels in some parts of the farm, moderate presumptions about erosion happening in some parts of the year or slowly

4	slight presence of mudslides or erosion channels, low presumptions about erosion happening in some parts of the year or slowly
5	no presence of mudslides or erosion channels, almost no presumptions of erosion happening in some parts of the year or slowly

4.1.4 Soil salinization minimisation

DEFINITION

Salinization is the accumulation of soluble salts of sodium, magnesium, and calcium in soil to such an extent that soil fertility is severely reduced[58]. In the early stages, salinity affects the metabolism of the soil organisms and reduces soil productivity, but in advanced stages it destroys all vegetation and other organisms living in the soil, transforming fertile and productive land into barren and desertified lands[59]. The accumulation of soluble salts in soil occurs when evaporation exceeds precipitation and irrigation, and salts migrate from deep soil layers to the surface, or are accumulated in topsoil horizons. Natural soil salinization, referred to as 'primary salinization', occurs in arid and semi-arid climatic zones when salts are naturally present in surface layers in low-lying areas, and due to evapotranspiration being higher than precipitation they are not leached but build-up in the surface. 'Secondary salinization' is the term used to describe soil salinized as a consequence of direct human activities[60]. This criterion measures secondary salinization only.

GOOD EXAMPLES

Drip irrigation or rain-fed farming, desalination of irrigation water, drainage, green manuring, use of compost or farmyard manure, phytoremediation, inoculation with mycorrhiza[61].

INDICATORS

Visible signs of soil salinity (poor condition or absence of vegetation, presence of salt-tolerant weeds, areas that take longer to dry or the presence of unnatural colour soil crusting (white or dark)), type of irrigation water used, type of irrigation system, existence of drainage system, farmer's perspective on the level of soil salinity. *See also criterion 1.3.1.*

INTERVIEW QUESTIONS

- Do you have problems with salinization?
- Observe the state of the soil. What kind of water does the farmer irrigate with?
- Ask the farmer whether tests for the quality of irrigation water or soil electronic conductivity or some other indicator of soil salinity have been done.
- Also question about the irrigation system – is the irrigation system efficient (over- or under- irrigation)? Is there some form of a drainage system in place (if necessary)?

SCALE	**1**	visible soil salinity in most parts of the farm, an important problem with soil salinization
	2	problems with soil salinity in many parts of the farm
	3	some problems with soil salinity, or only in some parts of the farm
	4	rare problems with soil salinity, or only restricted to a small part of the farm
	5	no problems with soil salinity

4.1.5 Soil compaction minimisation

DEFINITION

Compaction of soil is the compression of soil particles into a smaller volume, which reduces the size of pore space available for air and water. Heavily compacted soils contain few large pores, less total pore volume, and consequently, a greater density. Compacted soils have a reduced rate of both water infiltration and drainage. This happens because large pores more effectively move water downward through the soil than smaller pores. Also, the exchange of gases slows down in compacted soils, causing an increase in the likelihood of aeration-related problems. Finally, a compacted soil also means roots must exert greater force to penetrate the compacted layer[62].

GOOD EXAMPLES

Reduction of traffic, reduced tillage, tilling only sufficiently dry soil, crop rotations including crops with various root distribution (deep-rooted plants for already compacted soils), having the soil continously covered, increasing organic matter content, use of soil cracking techniques.

INDICATORS

Visible signs of soil compaction, soil tillage technique, tillage when wet soil, amount of traffic. *See criterion 1.1.1.*

INTERVIEW QUESTIONS

- Observe the soil for signs of visible soil compaction.
- Also consider answers on tillage type, intensity, and frequency, and on the crop rotation in place.
- Is tillage done while the soil is still wet?
- How much traffic is there - what other machines – e.g., combines, manure spreaders, etc. pass through the fields?

SCALE	**1**	visible soil compaction in most parts of the farm, a big problem with soil compaction

2	problem with soil compaction in many parts of the farm
3	some problems with soil compaction
4	slight problems with soil compaction or restricted to a small part of the farm
5	no problems with soil compaction

4.2 BIODIVERSITY IMPACT

4.2.1 Maximisation of ecological networks

DEFINITION

Ecological networks (EN) refers to landscape elements at field, farm or landscape level providing habitats, hibernation sites, and food resources to the functional components of associated biodiversity of an agroecosystem. They are semi-natural environments that receive neither fertilizers nor pesticides. EN can also be classified according to their composition and different groups can be distinguished: tree EN (hedges, tree rows, scattered trees, grove, orchard), herbaceous EN (permanent grasslands, herbaceous strips), lithic EN (stone heaps, stone walls, branch or log heaps), and water EN (ponds, ditches)[63]. Unlike High Nature Value farmland, ecological infrastructure refers mostly to relatively smaller pieces or surfaces of land.

GOOD EXAMPLES

Having 5% or more of the farmland dedicated to different types of EN, that are sucessfully providing some ecological functions (e.g., food for pollinators, shelter for beneficial insects, etc.)[63].

INDICATORS

Proportion of farmland where EN is present.

INTERVIEW QUESTIONS

- Did the farm develop or does it maintain herbaceous strips, hedgerows, tree lines, forest plantations, ponds, dry-walls, or any other elements intended for enhancing functional biodiversity?
  NOTE: observe. Many farmers might not realize the importance of elements that they traditionally maintain on the farm. Some EN might also be revealed on the farm map or aerial photographs.

SCALE

1	no presence of EN
2	up to 2% of used agricultural land is EN

3	2.1-5% of used agricultural land is EN
4	5.1-10% of used agricultural land is EN
5	more than 10% of used agricultural land is EN, many efforts for developing ecological infrastructure

4.2.2 High nature value farming (HNVf)

DEFINITION

The term High Nature Value (HNV) farmland refers to types of farmland and farming activities that can be expected to bolster high levels of biodiversity of habitats and species[64]. The connectivity of habitats and movement of species is highly impeded in agricultural areas. This higher permeability of the landscape can be guaranteed by HNV farming practices (HNVf). In the EU's classification, there are three major types of HNV: farmland with a high proportion of semi-natural vegetation (Type 1), and farmland with a mosaic of low-intensity agriculture (Type 2) – which are mostly in marginal agricultural areas; and farmland that supports the presence of species of national or European conservation concern (Type 3) – which might be a part of a more intensive management system[65,66].

GOOD EXAMPLES

Implementing in some ways the three core characteristics/types of HNV farming[64]:

1 low-intensity management (low use of machinery, pesticides, fertilizers, low densities of livestock)

2 presence of semi-natural vegetation (e.g., traditional hay meadows and unimproved grazing land)

3 diversity of land cover (mosaic of land cover and use).

GRASSLANDS: high proportion of farmland with low livestock units (LU) per ha of forage (including off-farm grazing), high proportion of semi-natural grazing including grass, scrub, and wooded pasture, high diversity of forage types at holding level, small modal parcel or plot size, long edges between parcels or plots, late cutting of traditional hay meadows, shepherding (especially in the southern and eastern EU).

ARABLE FIELDS: low N and pesticide input per arable area (ha), high proportion of fallow land in arable rotation, semi-natural pasture and/or meadows adjacent to arable parcels, inclusion of ecological infrastructure features: semi-natural patches, field margins, hedges, stone walls, trees, water bodies, high diversity of crop types, small modal parcel or plot size, long edges between parcels or plots.

PERMANENT CROPS: low N and pesticide input per crop and per ha at holding level, large old trees/vines, semi-natural understory for all or most of the year, ecological infrastructure features can include semi-natural patches, field margins, hedges, stone walls, trees, water bodies, grazing of understory, late tillage (southern EU) or late mowing of understory, understory is spontaneous, not sown.

FOR ALL LAND USE-TYPES: distribution of wildlife species of conservation concern (mostly bird and butterfly species), semi-natural vegetation or mosaic of land use-types[64].

INDICATORS

Proportion of farmland where HNVf is present, type of HNVf: specific management regime to protect species of concern, presence of mosaic landscape, intensity of management, presence of semi-natural vegetation.

INTERVIEW QUESTIONS

Observe:

- Is the farmland dominated by semi-natural vegetation? Is it dominated by low-intensity agriculture or a mosaic of semi-natural and cultivated land and small-scale features?
- Does the farm conserve and manage high-nature value habitats (e.g., species-rich grasslands and rangelands, extensive cropping systems, wetlands, mosaic landscapes)?
- Is there a specific regime the farmer follows (e.g., when mowing the grassland or when cutting rush) that is done to protect certain species?
- Do they receive subsidies for these practices?

SCALE

1	no HNV features on the farm
2	intensively managed system that supports populations of some species of concern
3	farm with moderate diverse mosaic of landscape, of which up to 50% has low-intensity management and semi-natural vegetation (and other features of HNVf – see Figure 1)
4	farm with a diverse mosaic of landscape, of which up to 70% has features of HNVf
5	highly complex mosaic of landscape and almost all of the farm has features of HNVf

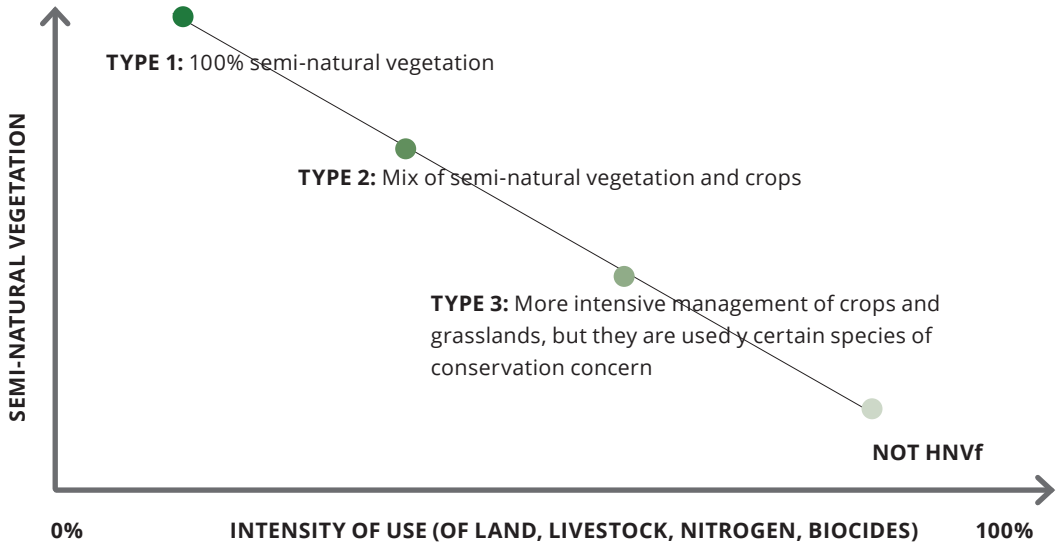

Figure 1. *The continuum of High-Nature Value farmland (HNVf) types in regard to semi-natural vegetation and intensity of use. Adapted from Beaufoy, G.: HNV Farming - Explaining the Concept and Interpreting EU and National Policy Commitments*[66].

4.2.3 Maximisation of agrobiodiversity

DEFINITION

Agrobiodiversity encompasses the variety and variability of micro-organisms, plants, and animals that are used directly for food and agriculture. It comprises of the diversity of genetic resources (varieties, breeds) and species used for food, fodder, fibre, fuel, and pharmaceuticals. Here the indicator agrobiodiversity is simplified as a diversity of land use types (compositional heterogeneity*), diversity of domestic animals, and diversity of crops.

* *Landscape diversity consists of two aspects: (i) compositional heterogeneity (diversity of habitat types); and (ii) configurational heterogeneity (number, size and arrangement of habitat patches), both with different ecological implications for community composition. Here we are measuring the first one only.*

GOOD EXAMPLES

Implementing more than one land use type (e.g., grassland and permanent crops), mixed farming (animals and crops), implementing a feasible level of complexity in terms of agrobiodiversity.

INDICATORS

Mean value is calculated from 3 types of agrobiodiversity:

1 Land use diversity - Shannon diversity index of compositional heterogeneity
2 Diversity of domestic animals (breeds and species) – direct enumeration
3 Diversity of crops (cultivars and species) - Shannon diversity index

Scales **1** and **3** are calculated using the Shannon diversity index ($H = -\Sigma p_i \ln p_1$)

INTERVIEW QUESTIONS

Ask the farmer about all crop and animal species, cultivars and breeds they have on the farm, and the proportion of the land in which they are grown / proportion of the total number of animals. The diversity of land types can be assessed most easily with a farm map, or if there is none – by enumeration of fields and land types by the farmer and if there is a possibility – walking through the fields and observing.

SCALE

1 – COMPOSITIONAL HETEROGENEITY - diversity of land use types – (temporary grassland, permanent grassland, forest, horticulture, arable crops, permanent crops, rangeland, ponds).

1	Shannon index value is between 0 and 0.3
2	Shannon index value is between 0.4 and 0.7
3	Shannon index value is between 0.8 and 1.1
4	Shannon index value is between 1.2 and 1.5
5	Shannon index value is higher than 1.5

2 – ANIMAL TYPES (SPECIES AND BREEDS) DIVERSITY
(e.g., two breeds of cattle and one breed of sheep equal to three animal types)

1	1 type of animal
2	2 types of animals (species and breeds)
3	3 types of animals (species and breeds)
4	4 types of animals (species and breeds)
5	5 and more types of animals (species and breeds)

3 – CROP TYPES (SPECIES AND CULTIVAR) DIVERSITY

1	Shannon index value is between 0 and 0.9
2	Shannon index value is between 1 and 1.5
3	Shannon index value is between 1.6 and 2.1
4	Shannon index value is between 2.2 and 2.6
5	Shannon index value is higher than 2.6

5 RESILIENCE

This dimension is a combination of criteria that already appeared in other dimensions and some new criteria.

5.1 CLIMATE RESILIENCE

1.1.6 **Maximisation of soil cover** See page 16

1.3.1 **Efficient water management** See page 25

1.3.2 **Favourable microclimate management** See page 26

4.1.2 **Soil carbon budget optimization** See page 64

4.2.3 **Maximisation of agrobiodiversity** See page 67

5.1.1 Maximal use of stress-tolerant species, breeds and cultivars

DEFINITION

Stress tolerance traits help enhance yield by giving plants protection from abiotic and biotic stresses. This is especially important in semiarid regions, where high temperatures and drought are limiting factors. Lodging and disease resistance are particularly important in wet and rainy regions. In general, traits like high-temperature tolerance, flood tolerance, drought tolerance, salinity tolerance, and lodging resistance are useful traits to withstand the adverse effects of climate change[6].

GOOD EXAMPLES

Substantial use of stress-tolerant species, breeds and cultivars.

INDICATORS

Proportion of use of cultivars, breeds and species with stress-tolerant traits, percentage of low demanding animals.

INTERVIEW QUESTIONS

Combine answers from 1.1.7, 1.2.2, and 3.3.1 and relate them to stress tolerance:

- What animals do you raise?

- Please list all the species and breeds of animals present on the farm and approximate numbers for each species.
- What made you choose these particular breeds (what traits do they have)?
- Do you have any local breeds?
- Do you cross local breeds with other breeds?
- If so, what is the purpose of this?

SCALE

1	none of the species, breeds and cultivars have stress-tolerant characteristics
2	up to 25% of the animal species and breeds have stress-tolerant characteristics, and/or up to 25% of the used agricultural land is planted with crop species and cultivars that have stress-tolerant characteristics
3	up to 50% of the animal species and breeds have stress-tolerant characteristics, and/or up to 50% of the used agricultural land is planted with crop species and cultivars have stress-tolerant characteristics
4	up to 75% of the animal species and breeds have stress-tolerant characteristics, and/or up to 75% of the used agricultural land is planted with crop species and cultivars have stress-tolerant characteristics
5	(almost) all the animal species and breeds have stress-tolerant characteristics, and (almost) all of the agricultural land used is planted with crop species and cultivars that have stress-tolerant characteristics

5.2 ECONOMIC RESILIENCE

2.2.5 High level of diversification of activities

See page 34

5.2.1 Short and local food marketing chains

Mean value of **2.2.3.3**. and **2.2.3.4.**

5.2.2 High diversity of products

DEFINITION This refers to whether the farmer is selling a range of products, in that way reducing uncertainties connected to crop prices, market stability, extreme weather events, etc.

GOOD EXAMPLES	A good economic distribution of profits from different products.
INDICATORS	Share of the main product in the total quantity of production.
INTERVIEW QUESTIONS	• Please list all the crops that you grow. • What animals do you raise? • Please list all the species and breeds of animals present on the farm. • What kind of products do you produce. • What products bring most profit? • What is their approximate share for the economic turnover of the farm?

SCALE

1	the major product has a share of 90-100% in the total production
2	the major product has a share of 70-89% in the total production
3	the product with the highest share in the production has 45-69% in the total production
4	the product with the highest share in the production has 20-44% in the total production
5	no product has more than 20% share in the total production.

5.2.3 High diversity of clients

DEFINITION	Refers to managing risk by broadening the clientele base. The economic resilience is higher if the farm is not dependent on a single outlet to sell their products.
GOOD EXAMPLES	Direct sales (automatically high number of clients) or combination of direct sales with a couple of outlets.
INDICATORS	Share of each client in the purchase of the production (on average).
INTERVIEW QUESTIONS	• What is your marketing scheme? • To whom do you sell your products? • Is it retail, Internet, farm-gate, restaurant?

- Please enumerate all outlets and approximate the percentage of shares of your production that you sell to each client.

SCALE		
	1	One client buys all or nearly all of the production
	2	One client buys 50% - 90 % of production
	3	One clients buys maximum 30 - 49% of production
	4	One client buys maximum 10 – 29% of production
	5	Each client buys less than 10% of production

5.2.4 Good temporal distribution of revenue

DEFINITION

EBITDA ("earnings before interest, taxes, depreciation, and amortization") is a measure of a company's overall financial performance. It strips out the cost of capital investments like property, buildings, and equipment. This metric also excludes expenses associated with debt by adding back interest expense and taxes to earnings[68]. This criterion measures the spread of EBITDA throughout the year to determine how resilient the farm is concerning the flow of revenue.

GOOD EXAMPLES

Diversity of products and activities creating a good level of temporal distribution of revenue.

INDICATORS

Distribution of EBITDA through the year.

INTERVIEW QUESTIONS

- How is your revenue distributed throughout the year (not taking into account amortization, taxes, etc.)?

SCALE		
	1	80% of the revenue flows are concentrated in 2 months of the year
	2	80% of the revenue flows is concentrated in 4 months of the year
	3	80% of the revenue flows is concentrated in 6 months of the year
	4	80% of the revenue flows is concentrated in 8 months of the year
	5	80% of the revenue flows is concentrated in 10 months of the year – very stable distribution of revenue through the year

5.2.5 Low share of subsidies in gross farm income

DEFINITION

EU producers are highly dependent on public support (direct payments, rural development measures). The EU average share of direct payments in agricultural factor income in 2013-2017 stood at 26%[69]. However, there are considerable differences between the Member States, ranging from 20% or less in Croatia and the Netherlands to more than 40% in the Czech Republic and Denmark. Taking all subsidies into account, total public support in agricultural income reached 37% of agricultural income on average in the EU[69]. This means that in case of dramatic public expenditure cuts, the farmer's income might be hit irreparably. Applying for subsidies also usually takes a considerable amount of time, often requires hiring consultants, and following a specific protocol for several years, even when it might not fit the farmer's situation anymore.

GOOD EXAMPLES

Striving for profitability without depending on subsidies.

INDICATORS

Share of subsidies in gross income.

INTERVIEW QUESTIONS

- How would you approximate the share of subsidies in your total income?

SCALE

1	share of subsidies in gross income is 70% or higher
2	share of subsidies in gross income is between 50% and 70%
3	share of subsidies in gross income is between 25% and 49%
4	share of subsidies in gross income is between 10% and 24%
5	share of subsidies in gross income is lower than 10%

5.2.6 Ability to attract and keep motivated workforce

DEFINITION

Motivating and retaining skilled employees is important to farm businesses because high employee turnover results in a loss of knowledge and skills that can be expensive and tedious to replace. Not only are there costs for the recruitment and training of new entrants, there can also be less obvious drains such as decreased down-time while new people make mistakes and slowly reach full performance[70].

GOOD EXAMPLES	Good working conditions and environment that builds a base of loyal workers that are experienced and have a good knowledge of the farm system.
INDICATORS	Proportion of permanent and/or returning seasonal workers. Additional remarks can be added in the qualitative description.
INTERVIEW QUESTIONS	• Are the workers employed seasonally (if yes – how long is the season)? • How many people are employed seasonally and how many throughout the year? • How much are the workers paid? How much freedom do they have in deciding on everyday matters (ask to workers)? • Do you have a stable pool of workers or do you have to look for new ones each year? • Observation of the workers' satisfaction with the workplace.

SCALE

1	no permanent workers or returning seasonal workers
2	very few permanent workers, a minor number of returning seasonal workers
3	a few permanent workers and/or a moderate number of returning seasonal workers
4	most of permanent workers and/or seasonal workers have been working in the farm for more than 3 seasons and up to 5
5	nearly all of the workers have been working in the farm for more than 5 seasons

5.2.7 High level of autonomy from commercial inputs

Below is a proposal on which indicators could be measured, it is not required to have exact results for all of them when assessing the criterion, unless the assessor is interested in having more precise results for this criterion.

5.2.7.1 Water

DEFINITION	Measures whether the farm is dependent on bought irrigation water (or water for other purposes, e.g., cleaning vegetables) or it depends on low amounts of irrigation water or is self-sufficient in terms of water.

GOOD EXAMPLES	Dry farming (rain-fed), use of greywater and rainwater, very low use of water.
INDICATORS	Approximate consumption of bought water in m^3/ha/y.
INTERVIEW QUESTIONS	• How much of the water that you pay for do you use yearly? (Approximate consumption in m^3/ha)

SCALE		
	1	more than 6000 m^3/ha/year
	2	3000-6000 m^3/ha/year
	3	1000-2999 m^3/ha/year
	4	500-999 m^3/ha/year
	5	less than 500 m^3/ha/year

5.2.7.2 Plant reproductive material

DEFINITION	Measures whether the farm buys most of seeds, seedlings, plants, or cuttings, or they produce them at the farm.
GOOD EXAMPLES	Most of the seed produced in the farm.
INDICATORS	Share of bought seeds and seedlings in the total reproductive material used.
INTERVIEW QUESTIONS	• Do you buy all your seeds, or do you save some percentage? • What percentage do you save? • Do you make your own seedlings?

SCALE		
	1	the farm buys 75-100% of the seeds
	2	the farm buys up to 75% of the seeds and/or produces a part of seedlings
	3	up to 50% of the seeds are produced on the farm and/or the farm produces all of their seedlings

4	the farm buys up to 25% of the seed and/or produces all of their seedlings
5	(almost) all of the seeds and/or seedlings are produced on the farm

5.2.7.3 Young animals for production

DEFINITION

Measures whether the farm buys commercial young animals for each production batch, or if they reproduce young animals on the farm premises. Note: refers only to 'production' young animals – raised for producing meat or eggs in a limited period. It does not include reproductive animals (e.g., heifers, reproductive bulls) that are bought to enlarge the herd/flock.

GOOD EXAMPLES

Having most animals from own production (born on the farm).

INDICATORS

Ratio of young animals bought for each production batch to the total number of young animals in the farm.

INTERVIEW QUESTIONS

- Do you buy young animals (e.g., chicks, piglets, fish larvae)?
- Regularly (for each production batch) or only on certain occasions?

SCALE

1	75-100% of young animals are bought for every new batch
2	50-74% of the batch are bought young animals
3	25-49% of the batch are bought young animals
4	10-25% of the batch are bought young animals
5	generally all of the batch is farm-born young animals

5.2.7.4 Commercial nitrogen

DEFINITION

Measures to what extent the farm is dependent on using commercial fertilizers. The dependency on fertilizers is simplified as 'dependency on commercial nitrogen' (which can originate both from synthetic and organic bought fertilizers.

GOOD EXAMPLES Most of the soil fertility is built with resources from within the farm system (farmyard manure, legumes in crop rotations, etc.).

INDICATORS Kg/ha of commercial nitrogen.

INTERVIEW QUESTIONS
- What fertilizers do you use and in which amounts do you apply them?
- Do you buy manure or compost?
- If yes, what is the quantity you acquire yearly?

SCALE

1	more than 200 kg/ha of commercial nitrogen
2	150-200 kg/ha of commercial nitrogen
3	100-149 kg/ha of commercial nitrogen
4	50-99 kg/ha of nitrogen of commercial nitrogen
5	less than 50 kg/ha of commercial nitrogen

5.2.7.5 Commercial insecticides and acaricides

DEFINITION Measures to what extent the farm is dependent on using commercial insecticides and acaricides.

GOOD EXAMPLES Zero or extremely rare use of commercial insecticides and acaricides (see 1.1.3).

INDICATORS Measured using the TFI (Treatment Frequency Index) $TFI_{field\ i,\ crop\ j} = \sum_{t=}^{t=} \frac{Dt}{DAt} \times \frac{St}{Sfield\ i}$
With T being total number of pesticide treatments (in one or more category of pesticides); Dt being applied rate in active substances; DAt being approved rate for the active substances; St/Sfieldi part of the fieldi with the treatment t; normalized on an annual basis[71, 72, 73, 74].

INTERVIEW QUESTIONS
- What insecticides do you use?
- What is the average number of treatments per year that you use?
- What is the application rate?
- For which crops do you use them (approximate proportion of the land treated/total used land)?

SCALE	**1**	the TFI is larger than 7
	2	the TFI is between 5.1 and 7
	3	the TFI is between 3.1 and 5
	4	the TFI is between 1.1 and 3
	5	the TFI is between 0 and 1

5.2.7.6 Commercial herbicides

DEFINITION Measures to what extent the farm is dependent on using commercial herbicides.

GOOD EXAMPLES Zero or extremely rare use of commercial herbicides (see 1.1.5).

INDICATORS Measured using the TFI (treatment frequency index) $TFI_{\text{field } i,\ \text{crop } j} = \sum_{t=}^{t=} \frac{Dt}{DAt} \times \frac{St}{S\text{field i}}$

INTERVIEW QUESTIONS

- What herbicides do you use?
- What is the average number of treatments per year?
- What is the application rate?
- For which crops do you use them (approximate proportion of the land treated/total used land)?

SCALE	**1**	the TFI is larger than 4.5
	2	the TFI is between 3.1 and 4.5
	3	the TFI is between 1.6 and 3
	4	the TFI is between 0.8 and 1.5
	5	the TFI is between 0 and 0.7

5.2.7.7 Commercial fungicides and bactericides

DEFINITION Measures to what extent the farm is dependent on using commercial fungicides.

GOOD EXAMPLES Zero or extremely rare use of commercial fungicides and bactericides (see 1.1.4).

INDICATORS Measured using the TFI (treatment frequency index) $TFI_{\text{field } i,\ \text{crop } j} = \sum_{t=}^{t=} \frac{Dt}{DAt} \times \frac{St}{Sfield\ i}$

INTERVIEW QUESTIONS

- What fungicides do you use?
- What is the average number of treatments per year?
- What is the application rate?
- For which crops do you use them (approximate proportion of the land treated/total used land)?

SCALE

1	the TFI is larger than 7
2	the TFI is between 5.1 and 7
3	the TFI is between 3.1 and 5
4	the TFI is between 1.1 and 3
5	the TFI is between 0 and 1

5.2.7.8 Commercial biological control agents

DEFINITION Measures to what extent the farm is dependent on using commercial biological control agents.

GOOD EXAMPLES Not relying on periodical releases of commercial BCAs, but on ecological networks which provide food and shelter for beneficial insects (see 4.2.1).

INDICATORS Measured using the TFI (treatment frequency index) $TFI_{\text{field } i,\ \text{crop } j} = \sum_{t=}^{t=} \frac{Dt}{DAt} \times \frac{St}{Sfield\ i}$

INTERVIEW QUESTIONS

- Do you use commercial biological control agents?
- How often do you release them on average?
- In which crops (approximate proportion of the land treated/ total used land)?

SCALE

1	the TFI is larger than 2
2	the TFI is between 1.1 and 2

3	the TFI is between 0.5 and 1
4	the TFI is between 0.2 and 0.4
5	the TFI is between 0 and 0.1

5.2.7.9 Animal feed

DEFINITION	Measures how dependent the farm is on commercial feed concentrates (e.g., cereal grain, pulses including soybean, feed pellets...) and/or commercial (bought) hay or silage?
GOOD EXAMPLES	Producing the largest part of forage on the farm or acquiring it via non-monetary economy (see 1.2.2).
INDICATORS	Proportion of forage produced on the farm or received via non-monetary economy.
INTERVIEW QUESTIONS	Combine answers from 1.2.2, 1.2.3 and 2.1.1.16.

SCALE

1	very low proportion (less than 20%) of forage self-sufficiency
2	20-40% of forage self-sufficiency
3	41-60% of forage self-sufficiency
4	61-80% forage self-sufficiency
5	very high forage self-sufficiency (more than 80%)

5.2.7.10 Veterinary drugs

DEFINITION	Measures how dependent the farm is on giving animals commercial veterinary drugs to keep diseases and parasites in check.
GOOD EXAMPLES	Choosing robust breeds and using natural preventive means rather than curative chemicals, minimising use of antibiotics (never giving them to healthy animals) (see 1.2.2).

INDICATORS	Mean value of commercial drug treatments that each animal receives per year or continual use of pharmaceutics.
INTERVIEW QUESTIONS	• How many treatments with drugs have the animals received this year?

SCALE		
	1	continuous treatments with at least one drug
	2	mean value is higher than 3
	3	mean value is between 2-2.9
	4	mean value is between 1-1.9
	5	average is less than 1 drug per animal per year

5.2.7.11 Workforce

DEFINITION	Measures how dependent the farm is on hired labour (*not considered as a negative factor*). Processing and marketing activities are not included. In case the workers engage in both production and processing activities, the farmer should approximate the percentage of working hours needed for production versus processing, and then only the production working hours are calculated.
GOOD EXAMPLES	Finding a good balance between number of FTEs and the farm's profit margin in terms of efficiency and profitability while maintaining a high level of labour conditions.
INDICATORS	Hired labour (family labour is not included) expressed as full-time equivalents (FTE) per hectare.
INTERVIEW QUESTIONS	• How many workers do you employ? • If the farmer can approximate - how many full-time equivalents are there in total working on the production activities? (Otherwise should be calculated by the surveyor.)

SCALE		
	1	above 1 FTE/ha
	2	0.5-1 FTE/ha

3	0.01- 0.5 FTE/ha
4	0.001–0.01 FTE/ha
5	0

5.2.7.12 Energy

DEFINITION

Measures how much the farm is reliant on energy sources. Energy consumption is a growing concern considering the increasing prices of non-renewable energy sources and the forecasts for future energy crises due to shortages of non-renewable energy sources. This measure considers the fuel used for machines and electricity for water pumps and greenhouse technology (and for other major energy consumers). If there is some energy generated in the farm and used for farming this is reduced from the total consumption. Energy consumption for processing and other non-productive activities is not included in the calculation.

GOOD EXAMPLES

Ways to minimize energy dependency by producing electricity from their own renewable energy sources (e.g., solar panels, biodigester), and/or having very low energy demands by using little farm machinery or energy-saving machinery.

INDICATORS

The energy consumption is calculated in kilograms of oil equivalent (kgOE)/ha/year*.

* *See https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Kilograms_of_oil_equivalent_(kgoe) and https://www.unitjuggler.com/convert-energy-from-koe-to-toe.html*

INTERVIEW QUESTIONS

- How big are your energy expenses/year (electricity, fuel)?
- What is the biggest expense?
- Do you use any energy from renewable sources?
- Is it produced on the farm or bought?
- What machines do you have (how many tractors, attachments, ask to show you)?
- Which machines use the most energy?
- Do you have greenhouses?
- Are they heated?
- For how many months of the year?
- Do they have an electric ventilation system?
- When do you heat them?
- Do you have storage facilities?

- Do they have a controlled atmosphere?
- Can you approximate the amount of oil and/or electric energy that you buy/ pay for during one year?

SCALE		
	1	more than 150 kgOE/ha
	2	101-150 kgOE/ha
	3	51-100 kgOE/ha
	4	11-50 kgOE/ha
	5	0-10 kgOE/ha

INTERVIEW PROTOCOL

Pre-Interview Considerations

Before starting the interview, the interviewer should already be familiar with the list of criteria and the proposed indicators. While the question order and phrasing are suggested, they can be modified to best suit the 'natural flow' of the conversation. For each question, the interviewer will find on the left side the criteria whose scores will likely be affected by the answers.

The **DESCRIPTIVE** data next to the questions set refers to the numerical descriptive information on the farm, e.g., size, number of agricultural working units (AWU) – i.e. FTEs, specific numbers of different animals, etc. (see Checklist of criteria and additional information necessary for the spreadsheet).

The **QUALITATIVE** data next to the questions set number refers to any additional information that is not measured in a semi-quantitative scale, but that may still be interesting for the written qualitative report (farm portrait).

For the criteria **1.1.3, 1.1.4** and **1.1.5** the evaluator should have data on regional good practices or IPM recommendations.

The questions written in *italics* correspond to optional criteria.

For the optional criterion, 'Low variable costs', data on the regional averages in farm expenditures is required. For the optional criterion, **5.2.7** 'Farm autonomy', the indicators **5.2.7.5-5.2.7.7** require the calculation of TFI (treatment frequency index), for which data on biocide rates and active substances is necessary.

When contacting a farmer to prepare for the interview, ask them to bring (if possible): a map of the farm (printed or digital), their pesticide application and BCA (biological control agents) release records (if assessing for 'Farm autonomy'), and records of their yearly expenses (if assessing for 'Low variable costs'). Approximations of these expenses are sufficient; they does not have to be exact amounts.

There are some parts of the questionnaire that are intended for the farm workers (both male and female) in company-run farms, to both spouses separately or to members of different genders in family and/or collective farms. Having a female member of the interviewing team carrying out interviews with women is an asset.

Interview questions

1. **QUALITATIVE**	• Name • Age • Education • Motivation for working within agriculture • The farm's history
2. **FARM SIZE,** **4.2.3**	• What is the size of your plot/the land that you use to cultivate? • How much of that land is used for arable crops, permanent crops or horticulture? • How much is temporary grassland, permanent grassland, forest, horticulture, rangelands, ponds? (It is helpful if the farmer can show a map of the farm so that the surveyor can calculate the compositional heterogeneity more easily.)
3. **FARM SIZE**	• How would you compare the size of your farm to similar farms in the region?
4. **2.1.1, 2.1.2,** **5.2.6, 5.2.7.12**	• Do you have any machines? • If so, what kind (how many tractors, attachments; if possible ask the farmer to show you)? • Do you often buy new machines? • *Have you bought any in the last 5 years?* • *If so, which ones?* • How do you decide when to buy a new machine or tool? • *Which machines use most energy to run?* • *If they bought machines in the last 5 years, inquire about their price.* • *Have you paid off these machines in full or are you currently in debt?* • Were the machines bought with subsidies or from personal funds?
5. **QUALITATIVE**	• Did you alter any of your machines or tools to suit you better or did you make any of them from scratch?
6. **2.1.1.17**	• *Do you use services (e.g., a contractor for tillage, grass harvesting or other operations)?* • If so, *how much do you spend on these services per year?*

7. **1.3.1**	• Do you conserve water (rainwater, recycling grey water)? • Do your local conditions require you to do so?

CROPS

8. **1.3.1, 1.1.7,** **4.1.4, 5.2.7.1**	• What kind of irrigation system do you have? • Are all the plots irrigated? • What is the proportion of irrigated land? • When do you normally irrigate (is there a schedule you follow)? • How much do you irrigate (*specified in m^3/ha/year*)? • What kind of water do you irrigate with? • Is there some form of drainage system? • Have you noticed if any of the crops you grow require more water than others to thrive? • If so, which ones?
9. **2.1.1.1, 5.2.7.1**	• *Do you buy water for your irrigation needs?* • *If so, what quantity, and how much do you spend on it yearly?*
10. **DOMINANT PRODUCTION,** **4.2.3**	• Please list all of the crops that you grow (species and cultivars), and aproximate surfaces on which they are grown.
11. **1.1.2, 1.1.3,** **1.1.4, 1.1.5,** **1.1.6, 2.1.1,** **4.2.3**	• (If applicable:) Do you engage in crop rotations? • If so, do you have one or several? • Do you rotate in all fields or only in some plots? • How long are the rotations? • Which sequence do you use? • What is the intention behind your crop rotation?
12. **2.1.1.15,** **2.1.1.16, 2.1.2,** **4.1.1, 4.2.3**	• Do you have any greenhouses? • How big are they? • What material are they made from? (If they are made of plastic - how often is it replaced?) • Are they heated? • If so, for how many months of the year (period of time)? • Do they have an electric ventilation system? • What is grown in the greenhouses?

- Do you have storage facilities?
- Do they have controlled atmosphere?

13.
1.1.1, 1.1.2, 4.1.2, 4.1.3, 4.1.5, 4.2.2

- Do you till the soil?
- With what machines? (The farmer should enumerate all the machines and processes used.)
- Do you know how deep you go when tilling?
- With what speed? (Also, if the field is at slope: what is the direction in which the machines pass?)
- How often do you work the soil per year?
- Is it the same in all plots or do some have different management techniques per plot?
- Do you sometimes till wet soil?
- Do you use direct seeding? In all plots or only some?

14.
1.1.2, 1.1.6, 2.1.1.6, 4.1.1, 4.2.3

- What happens after you harvest a field?
- Do you leave the residues, compost them, or burn them?
- Do you use cover crops?
- What kind?
- Do you use mulch from organic materials or plastic foil (if the latter, how do you dispose of it afterwards)?
- *How much do you spend on it per year?* Do you use companion plants (intercropping) to cover the soil? (Ask to see the crops.)

15.
4.1.1, 4.1.3, 4.1.4, 4.1.5

- Does your land have any problems with soil erosion?
- With soil compaction?
- With soil salinization?
- Have you done tests for the quality of your irrigation water, soil EC (electric conductivity) or some other indicator of soil salinity? (Observe the fields for any visible signs.)

16.
1.3.2, 4.1.2

- Have you implemented ponds, terraces, swales, contour lines, or windbreaks into the farm; or in some other way altered the natural environment to enhance the microclimate (e.g., to stop erosion)?

17.
1.1.2, 1.1.4, 1.1.6, 4.2.3

- What processes do you use to enhance fertility in your fields? Are any of the following methods used:
  - legume-based temporary grassland in crop rotation
  - pulses in crop rotation
  - legume-based green manure
  - organic manure: surface composting, heap composting, Bokashi
  - companion plant sowing in main crop

– recycling crop waste
– Ramial Wood Chip (RWC) or wood chips
– organic agro-industrial waste
– or some other methods?

18.
1.1.2, 2.1.1.2, 5.2.7.4

- Do you buy synthetic fertilizers?
- *If so, which ones?*
- *How much do you apply per ha/year?*
- *How much do you spend on it per year?*

19.
1.1.2, 2.1.1.3, 3.2.2, 4.1.1, 4.1.2, 5.2.7.4

- Do you use organic manure (farmyard manure, compost, etc.)?
- What type?
- Do you buy it, produce your own or get it from somewhere (either for free or in exchange for your products)?
- *How much do you buy per ha/year?*
- *How much do you spend on it per year?*
- How do you store it?

20.
3.2.4, 4.1.1, 4.1.2, 4.1.4

- Has the soil structure changed since you started farming?
- If yes, how? Have you done analysis of SOM and of nitrate/phosphate in the nearby ground or surface waters?
- If yes, what were the results? Has the SOM increased since you started farming?

21.
1.1.5, 1.1.6, 4.2.3

- Do you have (a lot of) problems with weeds?
- If so, how do you deal with them?
- Do you use mechanical weeding?
- Are any of the following methods used:
  – long crop rotation
  – temporary grassland in crop rotation
  – competitive crop species and cultivars
  – associated crops (e.g. cereal/pulse mixtures)
  – complex mixtures of green manure (cover crops) in intercropping
  – main crop sown in green manure mulch
  – permanent soil cover with companion species of the main crops
  – or some other methods?

22.
1.1.4, 4.2.1

- Do you have problems with crop pests?
- Which pest presents the biggest problem?
- How do you deal with it?
- Are there any intentional ecological infrastructures created against

	these pests (e.g., flower strips and hedgerows designed for enhancing populations of natural enemies)? • Observe. There might be EI even if the farmer is not aware of the concept
23. **1.1.3, 1.1.4, 1.1.5, 2.1.1.4, 5.2.7.5, 5.2.7.6, 5.2.7.7**	• Do you use pesticides? • If so, which ones? • Do you use any organic pesticides (if needed explain and give examples of organic pesticides, e.g., insecticides: neem, pyrethrum; herbicides: clove and cinnamon oil; fungicides: copper sulphate, etc.)? • *How often do you treat the plants and with what rate (important to find out all types of pesticides used)?* • *In all of the fields or only in some?* • *Which ones?* • *How much do you spend on them per year?*
24. FARMING SYSTEM, 1.1.3, 1.1.4, 1.1.5, 5.2.7.5, 5.2.7.6, 5.2.7.7	• How do you decide when to apply pesticides? • Do you apply pesticides regularly according to a calendar provided by the manufacturer? • Do you follow some monitoring/warning system? • What do you think about your pesticide management strategy? • Are you satisfied with the results?
25. **1.1.3, 2.1.1.7, 5.2.7.8**	• Do you use any biological control agents? (If needed, explain what they are –introduced commercial natural enemies of pest, e.g., fungi, bacteria, arthropods, etc.) • *How much do you spend on them per year?* • *Is it a big expense?* • *How many releases do you do per year on average?* • *In which parts of the farm?*
26. **1.1.4**	• Do you have problems with crop diseases? • Which disease represents the biggest problem? • How do you deal with it?
27. **1.1.2, 1.1.7, 2.1.1.5**	• Do you use any plant growth stimulators (If needed explain what they are)? • *How much per ha/year?* • *How much do you spend on them per year?*

28.
1.1.2, 1.1.4, 2.1.1.6

- Do you use effective micro-organisms (If needed explain what they are - mixed cultures of beneficial organisms that can be applied as inoculants to increase the microbial diversity of soil ecosystem)?
- *How much?*
- *How much do you spend on them per year?*

29.
2.1.1.8, 3.3.1, 5.1.1, 5.2.7.2

- Do you buy all of your seeds or do you save some percentage from the previous year's harvest?
- What percentage do you save?
- Do you make your own seedlings?
- Do you buy seed that is F1 hybrid or modern cultivars, or organic seed or conservation varieties/varieties developed for growing under particular conditions (amateur seed)?
- *How much do you spend on them per year?*
- How do you choose the crops you will plant (resilience, competition or purely market factors)?

ANIMALS

30.
1.2.2, 2.2.1, 3.3.1, 4.2.3

- What animals do you raise?
- Please list all of the species and breeds of animals present in your farm and approximate numbers for each species/breed.
- Why did you decide to have these particular breeds (what traits do they have)?
- Do you have any local breeds?
- Do you cross local breeds with other breeds? (If so, why?)

31.
1.2.1, 1.2.2, 1.2.3, 1.3.3

- Do your animals have access to pastures?
- For how many hours a day/months of the year?
- Do you have a specific system of grazing and stocking?
- How does it work?
- How many different paddocks are there and how big are they?
- What is the usual number of animals per paddock?
- Do different species graze together?
- How do you decide when it is time to move to another paddock? (Ask to see the condition of the paddocks.)
- Are there shelters in the paddocks (natural or built)?
- Do the animals graze in between trees in orchards?
- Do you give them some tree biomass as fodder?
- Do they receive additional haylage or silage during the grazing period?

32.

- Do you prepare haylage/silage for the winter?
- Do you use plastic foil for silage?
- *How much do you spend on it/year?*
- How do you dispose of it afterwards?

33.
1.2.2, 1.2.3, 2.1.1.11, 4.1.2, 4.2.2, 5.2.7.9

- Do you fertilize the grassland ?
- If so, is it with nitrogen, manure, or do you use grass-legume mixes (are the grasslands semi-natural or cultivated)?
- Are the paddocks irrigated?
- What is the percentage of legumes in the mix?
- How often and when is the grass cut (if it is cut)?
- Is there a specific regime you follow to protect certain species (e.g., birds or butterflies)?
- Do you receive subsidies for these practices?

34.
1.2.1, 1.2.2, 5.2.7.9

- (Ask for the farmer to show you the barns – the density should not be too high and they should be clean.)
- Are the animals attached (tied-up)?
- What kind of feed do the animals eat (check if it is diversified)?
- What is the production/animal?
- How much concentrates do the animals get on average?
- What is the usual life expectancy of female reproductive animals?
- How are the animals slaughtered?
- Who does it?
- If they are transported to the slaughtering facilities, how is the transport carried out?

35.
1.2.1, 1.2.2, 2.1.1.12, 5.2.7.10

- Do you have problems with animal parasites?
- Which parasite presents the biggest problem?
- How do you deal with it?

36.
1.2.1, 1.2.2, 2.1.1.12, 5.2.7.10

- Do you have problems with animal diseases?
- Which presents the biggest problem?
- How do you deal with it?
- What do you do with the sick animals (e.g., are they isolated, what is the withdrawal period)?
- What is the average length of life for 'non-meat' animals?

37.
2.1.1.9

- *Do you buy livestock sperm or ovule?*
- *In what percentage? How much per year?*

38. **2.1.1.10, 5.2.7.3**	• Do you buy young animals (e.g., chicks, piglets, fish larvae) regularly (for each production batch) or only on certain occasions? • *How much do you spend on them per year?*
39. **1.2.2, 2.1.1.11, 5.2.7.9**	• Do you buy all or most of the animal feed or do you prepare it yourself? • What is the percentage of the feed that is self-made? • What kind of feed is it*?* • *How much do you spend on it per year?* • Do animals receive feed during the grazing season?
40. **1.2.2, 2.1.1.12, 5.2.7.10**	• Do you buy veterinary drugs? • Synthetic or organic? • *How much do you spend on them per year?* • Do you use some methods to prevent illness and disease (e.g. tannin rich plants, phytotherapy)? • *How many treatments with veterinary drugs have the animals received this year?*
41. **2.1.1.13**	• Do you buy animal growth stimulators? • *How much do you spend on them per year?* (Applies to outside of the EU)
	GENERAL
42. **2.2.1, 2.2.2, 2.2.5, 3.3.2**	• What kind of products do you produce? • Is everything sold raw or are some things transformed/processed? • If processed, who does the processing? • What are your main products concerning the revenue you receive from them (could you please approximate shares in the total revenue)? • Do you follow some traditional recipes and methods when transforming products or is it new and modern recipes?
43. **2.1.1.16, 4.1.1**	• How do you pack your products? • What materials are used? • Is it a big expense? • *How much do you spend on these materials per year?*
44. **2.2.3, 2.2.4, 5.2.3**	• What is your marketing scheme? • To whom do you sell your products? • Is it via retail, Internet, farm-gate or to restaurants?

- Are you involved in any short supply chains (direct sales, CSA, shops without intermediaries)?
- How many intermediaries are there?
- Please enumerate all your outlets (clients) and approximate the percentage of shares of your production that you sell to each client.

45.
2.2.3, 2.2.4

- Are the products mostly sold for the local or national market, or are they exported?
- Where are they exported to?

46.
4.1.1

- Are you sometimes forced to throw away big quantities of your yield?
- When does that happen?
- Does it happen often?
- Does it involve large amounts of food?

47.
2.1.1.15, 5.2.7.12

- *How big are your energy expenses/year (electricity, fuel) (non-farming activities excluded)?*
- *Approximately how much fuel (oil) and electricity do you use per year?*
- *What is the biggest energy expense?*
- Do you use any energy from renewable sources?
- *Is it produced in the farm or bought?*

48.
2.2.5

- Are there any additional activities you are involved with (e.g., agritourism, education and training, food processing, gastronomy, working as a contractor, selling products from other farms)?
- How important are these activities for the farm revenue?

49.
3.2.4

- How do you transmit information about the farm to your customers?
- Do you have open days?
- Do you have a website?
- Do you perform any kind of quality controls or environmental tests?
- Would you/do you share this information with your customers?

50.
2.1.1.14, 3.1.4, 5.2.7.11

- How many workers do you employ?
- How many people from your family work on the farm?
- Do you and do they work full-time or part-time on the farm?
- If the farmer can approximate, how many full-time equivalents (FTE) are there in total? (Otherwise the assessor should calculate by themselves.)

51. **DESCRIPTIVE,** 3.1.1, 3.1.4, 5.2.6	• Are the workers employed seasonally (if yes, how long is the season)? • How many people are employed seasonally and how many throughout the entire year? • Do you have a stable pool of workers or do you have to look for new ones each year?
52. 3.1.3, 3.1.5	• How many women and how many men work on the farm?
53. 3.1.5	• Do you employ certain groups of people (e.g., pensioners, unemployed women over 50, Romani people, refugees, etc.) via social bureau or by private initiative? • What was your initial motivation to employ socially marginalized groups of people? • What has this experience been like?
54. 2.1.1.14, 3.1.2, 3.1.3, 5.2.6	• How much are the workers paid? • How much freedom do they have in deciding everyday matters? • Is there some kind of rotation of roles?
55. 2.3.1, 2.3.2, 5.2.4, 5.2.5	• How much do you earn per year (approximately)? (If the farmer is not willing to disclose this, that is fine. Ask considerately). • Are you satisfied with your income? • Does it allow for savings and/or reinvestment? • How would you scale the benefits from 1 (very low) to 5 (very high)? • How would you compare it to other similar farms of the region? • Is the revenue (not including account amortization, taxes, etc.) evenly spread throughout the year or almost exclusively in one part of the year (the growing season)? • In which months do you have flows of revenue? • How would you approximate the share of subsides in your total income?
56. 3.2.1, 3.2.2	• Do you exchange your products or animals with other farmers? • Are you part of a cooperative, CSA, social enterprise, solidarity farmers' market? • If so, what are the values of this cooperative/social enterprise?
57. 3.2.1, 3.2.2, 3.2.3	• Do you participate in some associations? Cooperatives? Networks? • In what way do you participate and how actively (what is your level of involvement?)

- Do you see a purpose in this organisation and a value in your efforts?
- Do you collaborate with some school or university?
- Do you work together with other farmers to achieve specific goals?
- Is or was the farm involved in some type of charity or solidarity economy project(s)?
- Are you involved in any form of advocacy work (aiming to influence decisions within political institutions)?
- In what way?
- What are your demands?

58.
3.5.1, 3.5.2

- What do you think about the future of the farm?
- Do you see it operating long-term?
- Could you please asses your level of optimism if 1 were completely pessimistic, and 5 completely optimistic?
- Is there someone in your family interested in working with you and later taking over the farm? (If the farmer is older than 50.)
- Or is there someone outside of your family who is interested to work with you and later take over the farm?

59.
QUALITATIVE

- What are your objectives and expectations for the future?

LIFE QUALITY & GENDER EQUITY SECTION

To be asked only in farms where the farm owners are working on the farm
– if possible, ask both spouses/male and female (family) members seperately

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60.
3.4.6

- Do you keep a part of the production for your family's needs?
- How much of your family's diet consist of your farm's produce (approximate percentage)?
- Do you have a garden for personal use?

61.
3.1.3

- How are decisions made in the farm?
- Who makes the decisions?
- Is there some kind of division of labour?
- How does it work?
- Who makes the decisions about crops, animals, machines, marketing?
- If you are in charge of something, do you make the decision by yourself or in consultation with your spouse/other family members?
- (If the farm is a member of an association, cooperative, etc.) do you or other family members usually participate in the meetings?
- How involved, in general, are you with this aspect of the farm?

62.
3.4.1, 3.1.3

- How many hours do you work on an average day, including household chores, or helping other family members?
- Are the working hours that you and your family puts in acceptable or tolerable?
- How would you estimate your (and your family's) workload from 1 - very big to 5 - acceptable?
- Think of how much spare capacity you have remaining after you finish working (time, energy).

63.
3.4.2, 3.1.3

- Do you find your job to be stressful?
- How stressful?
- Could you make an average score of the amount of stress you feel through the year *(NOTE: most farmers have a hard time making an assessment because there are very stressful moments, but they are not present all the time. Try to help them make an average approximation)* - where would that be on a scale of 1-5, 1 being extremely stressful, 5 being not stressful?

64.
3.4.3, 3.1.3

- Do you find that you have enough time to spend with your family and friends?
- Are you very satisfied, satisfied, is it acceptable, tolerable, or are you (completely) unsatisfied with the amount of time you have for them?
- Do you have time to participate in the social life of the community?

65.
QUALITATIVE,
3.4.4, 3.1.3

- Do you enjoy learning new skills and knowledge?
- Do you have sufficient time to acquire new knowledge and improve your skills?
- How satisfied are you with the time you have for personal education (on a scale from 1-5, 1 being having no time to acquire new knowledge and skills, to 5 being having sufficient time)?
- How do you usually learn?
- From whom do you learn the most (e.g., neighbours, family, internet, advisors, journals, other farmers, etc.)?

66.
3.4.5, 3.1.3

- How fulfilling and meaningful do you find your job?

Extra questions for clarification:

- Do you think your job is important?
- Do you feel motivated to do it?
- Do you find there are opportunities in your job for learning new skills and for 'self-realisation'?)
- Where would you position your job on a scale from 1 to 5, 1= It is not fulfilling at all / I don't feel motivated to do my job at all (I would much rather be doing something else) /I don't think it is an important job; and

5= I feel very fulfilled with the job that I am doing, I am very motivated, and wouldn't genuinely consider any other job/ I find that my job is extremely important for the wider community?

LABOUR CONDITIONS AND GENDER EQUITY SECTION

For farms with hired labour. If possible, interview one female and one male worker.

67.
3.1.1., 3.1.3

- *Observe* the conditions in which the workers work in.
- Are they safe?
- Do they seem satisfied?
- Is there a clear gendered distribution of roles?

68.
3.1.2, 3.1.3, 5.2.6

- How much is your salary?
- How satisfied are you with the job?
- Is there some kind of rotation of roles?
- If not, do you wish there was a rotation of roles?

69.
3.1.1, 3.1.3

- Are there any discriminations based on race, colour, gender, sexual orientation, disability, religion, political opinion, or freedom of association?
- Is there compliance with national legislation and industry standards regarding working hours and overtime regulations, with a mandatory one day of rest for every 6 consecutive days worked?
- Are lunch and work breaks granted and respected?
- Are workers provided with proper tools and suitable work clothes?
- Do all hazardous machinery and equipment have adequate safety devices, with safety equipment that is provided to all workers who are instructed and monitored in its proper use?
- Is the equipment for chemical spraying stored properly?
- Are all chemical handlers thoroughly instructed and trained in the safe application of, and the risks of pesticides and chemicals?
- Are the re-entry intervals after spraying pesticides, as defined by the manufacturer, strictly followed?
- If the company provides housing for permanent or seasonal/temporary workers – is the housing safe and appropriate for the number of people living within it?

70.
3.1.2

- Do you have clear employment contracts (included for temporary workers) with regular and documented payments?
- Are maternity and sick leaves granted and respected in accordance with national laws?
- Does the company provide social security for permanent workers?

- Do all permanent workers have a pension scheme or provident fund?

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71. (For women only.)

3.1.3

- Do female workers have any specific issues with the working environment?
- Do you feel safe?
- Is there possibility to choose roles within a reasonable framework?
- What is the proportion of women in managerial positions?
- Is there some sort of flexibility with working hours if a person needs to attend to, pick up children, etc.?

CHECKLIST OF CRITERIA AND ADDITIONAL INFORMATION NECESSARY FOR THE SPREADSHEET

1. FARMING PRACTICES

1.1 CROPPING

- ☐ Soil tillage
- ☐ Soil fertility management
- ☐ Pest management
- ☐ Crop disease management
- ☐ Weed management
- ☐ Soil cover
- ☐ Plant reproductive material

1.2 ANIMALS AND GRASSLANDS

- ☐ Animal welfare
- ☐ Livestock management
- ☐ Grassland management

1.3 NATURAL RESOURCES AND AGROFORESTRY

- ☐ Water management
- ☐ Microclimate management
- ☐ Agroforestry

2. ECONOMIC VIABILITY

2.1 PRODUCTION COSTS

- ☐ Low variable costs

OPTIONAL: RATING EACH INDICATOR

- ☐ *Irrigation water*

- ☐ *Synthetic fertilizers*
- ☐ *Organic manures*
- ☐ *Pesticides*
- ☐ *Plant growth stimulators*
- ☐ *Effective micro-organisms*
- ☐ *BCAS*
- ☐ *Seeds and seedlings*
- ☐ *Livestock sperm or ovule*
- ☐ *Young animals*
- ☐ *Animal feed*
- ☐ *Veterinary drugs*
- ☐ *Animal growth stimulators*
- ☐ *Wages*
- ☐ *Energy*
- ☐ *Materials - plastic, cardboard, etc.*
- ☐ *Services*
- ☐ Low fixed costs

OPTIONAL: RATING EACH INDICATOR

- ☐ *Machinery, tools*
- ☐ *Infrastructure*

2.2 REVENUE

- ☐ Product quality
- ☐ Product processing
- ☐ Short marketing chain
- ☐ Local marketing chain
- ☐ Diversification of activities

2.3 INCOME

- ☐ Income satisfaction
- ☐ Income compared to other farmers

3. SOCIO-POLITICAL ASPECTS

3.1. LABOUR CONDITIONS AND JOB CREATION

- ☐ Working conditions
- ☐ Wages, job stability, social protection
- ☐ Gender equity
- ☐ Job creation
- ☐ Employment of people at risk of poverty and social exclusion

3.2. COOPERATION AND NETWORKS

- ☐ Networks and collectives
- ☐ Social and solidarity economy
- ☐ Advocacy and education on agroecology
- ☐ Transparency

3.3 LOCAL CULTURE AND KNOWLEDGE

- ☐ Traditional seeds and breeds
- ☐ Traditional foods

3.4. QUALITY OF LIFE

- ☐ Satisfactory workload
- ☐ Low stress level
- ☐ Time for family and social relationships
- ☐ Time for knowledge and skills acquisition
- ☐ Finding work meaningful
- ☐ Self-consumption of food products

3.5. FARM VIABILITY

- ☐ Farmer's perspective on farm's future
- ☐ Young farmer or succesor

4. ENVIRONMENT AND BIODIVERSITY

4.1. ENVIRONMENTAL IMPACT

- ☐ Low pollution
- ☐ Soil carbon budget
- ☐ Soil erosion minimisation
- ☐ Soil salinization minimisation
- ☐ Soil compaction minimisation

4.2. BIODIVERSITY IMPACT

- ☐ Ecological networks
- ☐ High-nature value farming (HNVf)
- ☐ Agrobiodiversity

5. RESILIENCE

5.1. CLIMATE RESILIENCE

- ☐ Soil cover
- ☐ Water management
- ☐ Microclimate management
- ☐ Soil carbon budget
- ☐ Agrobiodiversity
- ☐ Stress-tolerant species, breeds and cultivars

5.2. ECONOMIC RESILIENCE

- ☐ Diversification of activities
- ☐ Short and local marketing chains
- ☐ Diversification of products
- ☐ Diversification of clients
- ☐ Revenue distribution
- ☐ Non-dependency on subsidies
- ☐ Workforce permanence
- ☐ Non-dependency on commercial inputs

OPTIONAL: RATING EACH INDICATOR

- ☐ *Water*
- ☐ *Plant reproductive material*
- ☐ *Young animals*
- ☐ *Fertilizers*
- ☐ *Insecticides*
- ☐ *Herbicidies*
- ☐ *Fungicides*
- ☐ *BCAs*
- ☐ *Animal feed*
- ☐ *Veterinary drugs*
- ☐ *Workforce*
- ☐ *Energy*

ADDITIONAL INFORMATION (DESCRIPTIVE INDICATORS)

- ☐ Farmer's age
- ☐ Farm size - total UAA - utilisable agricultural area (ha)
- ☐ Surface of arable land (ha)
- ☐ Surface of permanent crops (ha)
- ☐ Surface in horticulture (ha)
- ☐ Surface of grassland and rangeland (ha)
- ☐ Number of agricultural work units (AWU) in the family
- ☐ Number of external AWU
- ☐ Share of women's work in total AWU
- ☐ Number of seasonal workers
- ☐ Number of cattle heads
- ☐ Number of sheep heads
- ☐ Number of goats heads
- ☐ Number of reproductive cows
- ☐ Number of reproductive sheep
- ☐ Number of reproductive goats

☐ Number of laying hens

☐ Number of broilers

☐ Number of sows

☐ Donkeys

☐ Number of animals sold per year

☐ Number of eggs sold per year

☐ Fish weight sold per year

FARM TYPE

After http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Standard_output_%28SO%29

1. ARABLE

☐ 1.1 Specialist cereals, oilseed and protein crops

☐ 1.2 General field cropping

2. HORTICULTURE – MARKET GARDENING

☐ 2.1 Specialist horticulture indoor

☐ 2.2 Specialist horticulture outdoor

☐ 2.3 Nurseries

☐ 2.4 Other horticulture

3. PERMANENT CROPS

☐ 3.1 Specialist vineyards

☐ 3.2 Specialist fruit and citrus fruit

☐ 3.3 Specialist olives

☐ 3.4 Various permanent crops combined

☐ 3.5 Decoration trees (e.g. Christmas tree plantations)

3.6 Nurseries

4. MIXED CROPPING (combination of arable – permanent crops and/or horticulture)

☐ Mixed cropping

5. GRAZING LIVESTOCK

☐ 5.1 Specialist dairying

☐ 5.2 Specialist cattle-rearing and fattening

☐ 5.3 Cattle-dairying, rearing and fattening combined

☐ 5.4 Sheep, goats and other grazing livestock

6. MONOGASTRICS

☐ 6.1 Specialist pigs

☐ 6.2 Specialist poultry

☐ 6.3 Various granivores combined

7. AQUACULTURE

8. MIXED LIVESTOCK (combination of different livestock types)

☐ Mixed livestock, mainly grazing livestock
☐ Mixed livestock, mainly granivores

9. MIXED FARMING (crop – livestock integration)
☐ Field crops-grazing livestock combined
☐ Various crops and livestock combined

10. OTHER
☐ Non-classified farms

DOMINANT PRODUCTION

1. Arable crops
☐ 1.1 Food crop (crops that are consumed by people without industrial processing: e.g. cereals, grain maize, pulses, potato)
☐ 1.2 Feed crop (crops that are consumed by animals: e.g., cereals, pulses, temporary grasslands, green maize)
☐ 1.3 Industrial crop (crops that are not consumed as such but are processed by industries: e.g., sunflower, potato, sugar beat)
☐ 1.4 Seed production

2. Vegetables
☐ 2.1 Production
☐ 2.2 Nursery

3. Permanent crops (e.g., fruit trees, vineyards, oil trees, perennial aromatic plants, decoration trees, forest tree nurseries)
☐ 3.1 Production
☐ 3.2 Nursery

4. Permanent grassland and grazing livestock
☐ 4.1 Dairy cows
☐ 4.2 Beef cattle
☐ 4.3 Dual purpose cows (milk and meat)
☐ 4.4 Small ruminants (sheep, goats)
☐ 4.5 Other

5. Large-scale feedlots of beef cattle

6. Monogastrics (e.g. poultry and pig)
☐ 6.1 Large scale production in confined systems
☐ 6.2 Small and medium scale production (e.g. in shed on straw, in shed with an outdoor paddock, outdoor)
☐ 6.3 Hatchery, piglet production

7. Aquaculture
☐ 7.1 Production

☐ 7.2 Hatchery

FARMING SYSTEMS:

☐ 1. Organic farming (family garden excluded)
(www.fao.org/organicag/oa-faq/oa-faq1/en/)

☐ 2. Biodynamic agriculture (family garden excluded)
(www.biodynamics.com/what-is-biodynamics)

☐ 3. Permaculture

☐ 4. Conservation agriculture
(www.fao.org/conservation-agriculture/overview/what-is-conservation-agriculture/en/)

☐ 5. Integrated farming
(e.g., soil analysis, combination of biological pest control and pesticides,
use of an advertisement system as a decision tool before fungicide spreading)

☐ 6. Conventional farming / Green Revolution

☐ 7. Agroecology

☐ 8. Other

FARM PORTRAIT

FARM

Farm name

Picture of the farm

LOCATION

Address

Farm location on the map

CLIMATE AND GEOGRAPHY

– *Average precipitation*

– *Min temperature*

– *Max temperature*

– *Predominant soil type*

SHORT FARM DESCRIPTION AND FUNCTIONING

– Farm size

– What is being grown

– Which practices are being used

– Who are the workers and in what conditions do they work

– What kind of food supply chain is the farm involved in

– Any other important observations

Relevant chart

Relevant chart

FARM AGROECOLOGICAL CHARACTERISTICS

– Agroecological characteristics of the farm with short explanations

– If there are any negative impacts, they can also be briefly discussed here

Relevant chart

Relevant chart

FARM INFRASTRUCTURE, MACHINERY AND GARDEN

– General description of what kind of infrastructure and machines are used on the farm

– How old are they on average

– Mention whether the family has a kitchen garden for their personal needs

FARMER'S EDUCATION AND MOTIVATION FOR AGRICULTURE

– Short description of the farmer's education (could be formal and non-formal)

– Reasons for taking on farming

FARM EVOLUTION, OBJECTIVES AND EXPECTATION

– Short description of how the farm changed since the farmer first started working in the location and what was there before

– Describe the farmer's expectations and objectives for the future

RELATIONSHIP WITH NETWORKS AND ORGANIZATIONS

– If the farmer is a member of some movements, networks, or organisations (national or international) shortly describe in what way they participate in them and how important they are for them

FARMER'S FAMILY (IN CASE OF FAMILY FARM)

– Short description of the family members involved in farming activities and whether there is a possibility that the farmer's children might take on the business

(+) CONTEXTUAL LIMITATIONS AND OPPORTUNITIES

– In what way does the socio-political environment influence the farmer's management decisions

CHARTS

Relevant chart

Relevant chart

Relevant chart

Relevant chart

Relevant chart

Relevant chart

Relevant chart

Relevant chart

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Many indicator systems that assess the sustainability of agricultural systems have been developed in the past. OASIS, however, is one of the first analytical frameworks specifically designed to assess where a farm is on the trajectory of transition towards agroecology. OASIS allows the necessary data to be collected in a two-and-a-half-hour interview per farm, which makes national surveys possible. The selected criteria are simple and look at agricultural activities from the farmer's point of view.

Five main dimensions are addressed in the framework: Agroecological farming practices, Economic viability, Socio-political aspects, Environment and biodiversity, and Resilience.They are broken down into 15 themes and 56 criteria. The criteria are mostly assessed using practice-based indicators. The evaluation of the criteria is semi-quantitative, on a scale from 1 to 5. The maximum score (5) is the highest degree of practice of a fully-fledged agroecological system. Results are presented in reports containing radar charts and short qualitative descriptions.

OASIS can be used to help farmers in evaluating their progress through yearly evaluations. It can also be useful for decision-makers, advisors, researchers, students, and citizens. It may be used for mapping the state of implementation of agroecological practices and collecting statistical data for larger geographical areas.

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